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ENCYCLOPÆDIA BRITANNICA.

EIGHTH EDITION.

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THE
ENCYCLOPÆDIA BRITANNICA,
OR
DICTIONARY
OF
ARTS, SCIENCES, AND GENERAL LITERATURE.

EIGHTH EDITION.

WITH EXTENSIVE IMPROVEMENTS AND ADDITIONS;
AND NUMEROUS ENGRAVINGS.

VOLUME XIII.

ADAM AND CHARLES BLACK, EDINBURGH.

MDCCCLVII.

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ENCYCLOPÆDIA BRITANNICA.

J O N A H.

Jonah.

JONAH, the fifth in order of the minor prophets. No era is assigned to him in the book of his prophecy, yet there is little doubt of his being the same person who is spoken of in 2 Kings xiv. 25, where he is described as the son of Amittai, and a native of Gath-hepher, in the tribe of Zebulun. He flourished in or before the reign of Jeroboam II., and predicted the successful conquests, enlarged territory, and brief prosperity of the Israelitish kingdom under that monarch's sway.

The Book of Jonah contains an account of the prophet's mission to denounce Nineveh, and of his refusal to undertake the embassy—of the method he employed to evade the unwelcome task, and the miraculous means which God used to curb his self-willed spirit, and subdue his petulant and querulous disposition. After narrating his fulfilment of the Divine command we are again presented with another exemplification of his refractory temper. His attempt to flee from the presence of the Lord must have sprung from a partial insanity, produced by the excitement of distracting motives in an irascible and melancholy heart. The mind of Jonah was dark and moody, not unlike a lake which mirrors in the waters the gloomy thunderclouds overshadowing it, and flashing over its sullen waves a momentary gleam.

The history of Jonah is certainly striking and extraordinary. Its characteristic prodigy does not resemble the other miraculous phenomena recorded in Scripture; yet we must believe in its literal occurrence, as the Bible affords no indication of being a mythus, allegory, or parable. Our Saviour's pointed and peculiar allusion to it is a presumption of its reality (Matt. xii. 40). The opinion of the earlier Jews (Tobit xiv. 4; Joseph. *Antiq.* ix. 10, 2) is also in favour of the literality of the adventure. It requires less faith to credit this simple excerpt from Jonah's biography, than to believe the numerous hypotheses that have been invented to deprive it of its supernatural character. Some, who cannot altogether reject the reality of the narrative, suppose it to have had a historical basis, though its present form be fanciful or mythical. Grimm regards it as a dream produced in that sleep which fell upon Jonah as he lay on the sides of the ship. The opinion of the famous Herman

von der Hardt, as given by Rosenmüller was, that the book is a historical allegory, descriptive of the fate of Manasseh, and Josiah his grandson, kings of Judah. Tarshish, according to him, represents the kingdom of Lydia; the ship, the Jewish republic, whose captain was Zadok the high-priest; while the casting of Jonah into the sea symbolized the temporary captivity of Manasseh in Babylon. Others regard this book as an allegory, such as Bertholdt and Rosenmüller, Gesenius, and Winer—an allegory based upon the Phœnician mythus of Hercules and the Sea-monster. Less supposed that all difficulty might be removed by imagining that Jonah, when thrown into the sea, was taken up by a ship having a large fish for a figure-head—a theory somewhat more pleasing than the rancid hypothesis of Anton, who fancied that the prophet took refuge in the interior of a dead whale, floating near the spot where he was cast over board. De Wette regards the story as not a true history, yet not a mere fiction; its material being derived from popular legends, and wrought up with the design of making a didactic work. But many regard it as a mere fiction with a moral design—the grotesque coinage of a Hebrew imagination. This opinion, variously modified, seems to be that of Semler, Michaelis, Herder, Stäudlin, Eichhorn, Augusti, Meyer, Pareau, and Maurer.

These hypotheses are all vague and baseless, and do not merit a special refutation. Endeavouring to free us from one difficulty they plunge us into others yet more intricate and perplexing. Much profane wit has been expended on the miraculous means of Jonah's deliverance, very unnecessarily and very absurdly. The species of marine animal is not defined, and the word is often used to specify, not the genus whale, but any large fish or sea-monster. There is little ground for the supposition of Bishop Jebb, that the asylum of Jonah was not in the stomach of a whale, but in a cavity of its throat, which, according to naturalists, is a very capacious receptacle, sufficiently large, as Captain Scoresby asserts, to contain a merchant ship's jolly-boat full of men. Since the days of Bochart it has been a common opinion that the fish was of the shark species, *Lamia carnis carcharias*, or "sea-dog" (Bochart, *Op.* iii. 72; Calmet's

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Dissertation sur Jon.) Entire human bodies have been found in some fishes of this kind. The stomach, too, has no influence on any living substance admitted into it.

The Book of Jonah is a simple narrative, with the exception of the prayer or thanksgiving in chap. ii. Its style and mode of narration are uniform. There are no traces of compilation, as Nactigall supposed; neither is the prayer, as De Wette imagines, improperly borrowed from some other sources. That prayer contains, indeed, not only imagery peculiar to itself, but also such imagery as at once was suggested to the mind of a pious Hebrew preserved in circumstances of extreme jeopardy. There was little reason either for dating the composition of this book later than the age of Jonah, or for supposing it the production of another than the prophet himself. The Chaldæisms, which Jahn and others find, may be accounted for by the nearness of the canton of Zebuion, to which Jonah belonged, to the northern territory, whence by national intercourse Aramaic peculiarities might be insensibly borrowed. Gesenius and Bertholdt place it before the exile; Jahn and Koester after it. Rosenmüller supposes the author may have been a contemporary of Jeremiah; Hitzig postpones it to the period of the Maccabees. Apocryphal prophecies ascribed to Jonah may be found in the pseudo-Epiphanius (*De Vitis Proph.* c. 16), and the *Chronicon Paschale*, p. 149. Various spots have been pointed out as the place of his sepulchre, such as Mosul in the East, and Gath-hepher in Palestine; while the so-called Epiphanius speaks of his retreating to Tyre and being buried there in the tomb of Cenezæus, judge of Israel.

Among the numerous commentators on Jonah may be noticed J. Gerhard, *Annot. in Proph. Am. et Jon.*, &c., Frag. 1692; Lessing, *Observat. in Vatic. Jon.* 1782; Grimm, *Der Proph. Jionas af. Neue Uebersetz.* 1798; Forbiger, *Prohusio*, &c., 1827; Krahmer, *Das B. Jon. Hist. Krit. untersucht*, Cassel, 1839.

JONES, INIGO, a celebrated architect, often but absurdly called "the English Palladio" was born in London in 1572. His father was a respectable cloth-worker in the neighbourhood of St Paul's. Little is known of Jones' early years. According to some accounts he was apprenticed to a joiner; according to others, he received a liberal education. This much is certain, however, that while still very young he exhibited a great turn for drawing. Some of his designs fell into the hands of William, Earl of Pembroke, who was so much pleased with them that he supplied the draughtsman with the means of prosecuting his art-studies abroad for three or four years. Thus provided, Jones travelled through France, Germany, and Italy, carefully examining the best specimens of ancient and modern architecture, and taking measurements and drawings of such as struck his fancy. His progress was of course slow, as every important building, or at least every style had to be studied separately. He had left home without any training for the art-world that now began to open up before him. The Grecian orders had been forgotten in England, if indeed they had ever been known there; and the Italian orders had never been introduced, except in fragmentary details. This though a misfortune for England was an advantage to Jones. The popular Tudor style had begun to fall into disrepute from the many corruptions that had crept into it, and no other had arisen to take its place. To the fact that Jones now stepped in and supplied a long-felt want he owed the fame which he enjoyed in his own life-time, as well as in succeeding ages, and his nick-name (for it is nothing more) of "the English Palladio." In 1604, on the invitation of Christian IV., Jones migrated from Italy to Denmark, and is said to have there furnished the plans for the two royal palaces of Rosenborg and Fredericksborg. These edifices are both still extant, and if they really are due to their reputed architect, merely confirm the idea of his mediocrity. Their

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John Paul.

authenticity, however, is more than suspicious. In the following year Christian used his interest on Jones' behalf with his brother-in-law, James I. of England; and Jones on returning to his native country was kindly received at court. Besides being appointed architect to the Queen and Prince Henry, he was entrusted with the conduct of the masques, then a favourite court amusement. From the time, thought, and money, expended on these displays, they seem to have been little inferior in splendour to those magnificent fêtes afterwards given at Versailles by Louis XIV. Ben Jonson supplied the poetry; Jones the designs and decorations; skilful composers the music; while the royal family and the flower of the young nobles danced in the interludes. The best part of Jones' time was squandered on these shows, and accordingly none of his greater works can be referred to this period of his life. In 1612 he paid a second visit to Italy, and there learned the defects of the bastard style of mingled Greek and Gothic which his half-educated taste had led him too often to adopt. On his return home he was made surveyor-general of the royal buildings, and began to draw the designs for a new palace at Whitehall. The plans of the whole work, which is undoubtedly Jones' *chef d'œuvre* have been published along with many other of his drawings; but the only part of the proposed palace that was ever built is the Banqueting House. While the building was still in progress, Jones was commissioned by his royal patron to examine and report upon Stonehenge. He set about this task with a zeal far beyond its importance, and came to the startling conclusion that these vast and shapeless masses of stone were the ruins of a Roman temple. Posterity has only to regret that so much time and ingenuity should have been thrown away on such a solution of the mystery. Jones' next work was the restoration of old St Paul's. He renewed the sides with very bad Gothic, and completed his blunder with a splendid Corinthian portico. Both were much admired in their day, as were also his designs for the river-front of Somerset House. Not less bepraised were the arcade and church of St Paul, Covent Garden—"two structures," says Walpole, "of which I want taste to see the beauties. In the arcade there is nothing remarkable; the pilasters are as arrant and homely stripes as any plasterer could make. The barn-roof over the portico of the church strikes my eyes with as little idea of dignity and beauty as it would do if it covered nothing but a barn." With reference to the church Quatremère de Quincey, an upholder of Jones declares that the most memorable thing about it is the repute in which it is held. Surgeons' Hall, Lindsay House, Shaftesbury House, and many others both in London and the provinces, attest at once the fertility of their designer's pencil and the uncultivated taste of his employers. Scotland only boasts of two buildings in which Jones is said to have had a hand; these are, Heriot's Hospital in Edinburgh, and Glamis Castle in Forfarshire. His claims to the first are now held to be apocryphal; and such repairs as he executed on the second, add little to his credit.

When the civil war broke out Jones clung faithfully to his royal master and his party. Besides being a courtier, he was also a Roman Catholic, and therefore doubly hateful to the victorious Parliamentarians. The heavy fines which he was forced to pay failed to shake his loyalty or his faith, and he died, heart-broken and poor, July 21, 1651, in his seventieth year. Many of his designs were published at intervals after his death by Kent, Colin Campbell, and Isaac Ware; and his *Notes on Palladio* were published in an edition of that architect's works in 1714.

JONES, John Paul, was born in 1747, at Arbigland, in the parish of Kirkbean and stewartry of Kirkcudbright. He was a natural son of Craig of Arbigland; but his reputed father was John Paul, a gardener in that gentleman's service. The agnomen of Jones was assumed by himself

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at the outset of what may be called his public career. At the age of twelve he went to sea, and traded for some years to America. In the course of these voyages he made himself so thorough a master of seamanship and navigation, that, according to a local account, "he was allowed to be unmatched on that coast (the west coast of Scotland) for skill in sea matters." For some time he was engaged in the slave-trade, from which, however, after a few voyages, he retired in disgust. On his way back to England the captain and mate of the vessel in which he was, both died. At the request of those on board, Jones took the command, and brought the vessel safe into port. For this service, the owners made him captain of the ship, and in a few years he realized a handsome fortune. In 1773 he settled in Virginia on a property which had fallen to him on the death of his elder brother, a planter and merchant in that state. When the war of the American Independence broke out, he offered his sword to the revolted colonies, was made captain of a small ship of war, and in six weeks had made no fewer than sixteen prizes. In 1777 he set out for France, and was appointed to the "Ranger," with which he made a descent on the north coast of England, seized the fort of Whitehaven, burnt some of the shipping, and for some weeks kept the adjoining shores of England and Scotland in constant alarm with his single ship. Two years later he set sail on a similar expedition to the east coast, reached the Firth of Forth, and very nearly executed his threat of burning every ship in the harbour of Leith. A strong wind drove him out to sea, and saved the town. Altering his tack, he turned his prow southwards, and off Flamborough Head fell in with the homeward-bound British fleet from the Baltic, convoyed by two powerful men-of-war. After a desperate and bloody battle, one of these struck its flag to Jones' own ship, which was itself so much shattered in the action, that it went to the bottom next day. This victory raised his fame to its acme; and on his arrival in Paris he was presented by Louis XVI. with a splendid sword, enhanced in value by a very flattering inscription. For a while he reigned as the lion of the day in Paris, followed the fashions, and desired to be thought a man of *ton*. An Englishman then resident in the French capital described him as "a smart little man of thirty-six; speaks but little French, and appears to be an extraordinary genius; a poet as well as a hero." A contemporary Scottish account describes him as a "short, thick, little fellow, about 5 feet 8 inches in height, of a dark swarthy complexion." Jones, it seems, had already wrought hard to supply the defects of a neglected education, and talks in his letters of the "midnight studies" in which he was then engaged. On his return to America, Congress voted him a splendid gold medal, and passed a resolution commending his "zeal, prudence, and intrepidity." When peace was concluded, Jones returned to France as American agent for prize-money. A few years later he entered the Russian service with the title of rear-admiral, and was in the fair way of rising still higher when the jealousies and petty intrigues of his brother officers induced him to quit it altogether. It was in vain that Catharine tried to retain him by temptations of no ordinary value. He returned once more to Paris, where the great events of the Revolution prevented him from getting a hearing for his claims. The last days of his life were spent in poverty and neglect, embittered by lingering and painful diseases. An attack of dropsy finally carried him off, July 18, 1792.

JONES, William, an eminent divine of the Church of England, was born at Lowick, in Northamptonshire, in 1726. He received his education at the Charter-House and University College, Oxford. He became in succession vicar of Bethersden, Kent, in 1764; rector of Pluckley, perpetual curate of Nayland, Suffolk, and rector of Hollingbourne, Kent, in 1798. He took up his residence at Nayland, in 1776, and remained there till his death, in 1800. He was

an intimate friend of Bishop Horne, with whom he was associated in the defence of John Hutchinson's philosophical and theological tenets, and whose biography he wrote in 1795.

Although best known for his book on the Trinity, Jones employed his pen with considerable felicity on political and other subjects. Bishop Horsley eulogizes him for his "quick penetration, extensive learning, and sound piety, and for the talent he had of writing upon the deepest subjects to the plainest understandings."

His works were published, in 12 vols. 8vo, in 1801. The theological and miscellaneous works were republished in 6 vols. 8vo, in 1810. In addition, two posthumous volumes of sermons were published in 1830. The principal treatises are—*The Catholic Doctrine of the Trinity proved from Scripture*; *A full Answer to Bishop Clayton's Essay on Spirit*; *Remarks on the Confessional*; *Zoologia Ethica*; *A Course of Lectures on the Figurative Language of Scripture*; *An Essay on the Church*; *An Essay on the First Principles of Natural Philosophy*, and a number of political tracts written after the commencement of the French Revolution. Prefixed to the first volume is a life of the author (by William Stevens). Jones of Nayland was the originator of the *British Britic*.

JONES, Sir William, an illustrious Orientalist, lawyer, and general scholar, was born in London, September 28, 1746. He was the son of William Jones, a man of some note in his day, and the author of several treatises on the higher mathematics. This parent died when his son was only three years old; and the care of the child's upbringing devolved upon his mother, a woman of strong sense and considerable accomplishments. At the age of seven, young Jones was sent to Harrow, and remained at that school for ten years. Though his studies were on one occasion interrupted for a twelvemonth, he easily and far outstripped all the lads of his standing. The head master himself was so strongly impressed with the idea of his favourite pupil's intellectual force, that he often said that "if Jones were left naked and friendless on Salisbury Plain, he would nevertheless find the road to fame and riches." Another head master was heard to assert that Jones knew more Greek, and was a greater proficient in the idiom of that language than himself. During the latter years of his attendance at Harrow he began to dip into matters beyond the classic routine of the school. He mastered the Arabic alphabet, and made sufficient progress in Hebrew to be able to read the language with some ease. During his vacations he addressed himself to French and Italian. To perfect himself in most of these tongues he spent much time in composing in them. In 1764, being then in his eighteenth year, he went to Oxford, where, at University College, he continued to study as diligently and successfully as ever. The Eastern languages continued to engage his thoughts, and a native of Aleppo, whom he discovered in London, rendered him effective aid in his researches. After graduation he joined the family of Earl Spencer, as tutor to Lord Althorp, and resided with that nobleman for five years. A fellowship conferred upon him at this time placed him beyond the fear of want, and enabled him to prosecute his studies without distraction. His fame now began to spread as one of the first orientalists of his age. In 1768, while still with Earl Spencer, he had been requested by Christian VII. of Denmark to translate into French a Persian *Life of Nadir Shah*. The work appeared in 1770, and its value was enhanced by the treatise on Eastern Poetry, and the translations from the *Odes of Hafiz* (both written in French), which accompanied it. His *Persian Grammar*, published in the following year, is still the standard text-book on that subject. Having long contemplated with pleasure "the stately edifice of the laws of England," Jones now resolved to study for the bar. He had hardly begun when he found himself called upon to defend his university from the mean

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and unjust aspersions of the French orientalist, Anquetil du Perron, in his introduction to the *Zend-avesta*. The defence was written in the same language as the attack; and the French themselves have never denied that in the learning, as well as the bitterness of the controversy, their countryman was left far behind. Jones' pamphlet was anonymous; and its French was so racy and idiomatic that many foreign savans not acquainted with the details of the quarrel attributed it to some *bel esprit* of the French capital. In the following year he published a small volume of poems, chiefly translations from various eastern tongues. This work was a sort of harbinger of a far greater and more important one, which he gave to the world in 1774, under the title of *Poeseos Asiaticæ Commentariorum Libri Sex*. His design was to familiarize the European mind with the oriental modes of thought and styles, and the specimens of translation from the Hebrew, Arabic, Turkish, and Persian, show that, with this kind of learning, rare even among the most erudite men, the writer combined a taste rare even among *littérateurs*. He extracted so skilfully, and translated so adroitly, that the Eastern writers quoted by him acquired under his pen a charm and purity which one looks for in vain in their own works. Called to the bar in this same year, Jones devoted himself for a time exclusively to legal studies. A patriotic feeling was mingled with this resolve. "Had I lived at Rome or Athens," he said, "I should have preferred the labours, studies, and dangers of their orators and illustrious citizens, connected as they were with banishment and even death, to the groves of the poets or the gardens of the philosophers. Here I adopt the same resolution. The constitution of England is in no respect inferior to that of Rome or Athens." Carrying out this design, he tried to obtain a seat in parliament. But his politics were too liberal and too hostile to the government of the day. He was known to have expressed cordial sympathy with the American colonies in their revolt and War of Independence. He was strongly opposed to the slave-trade, and no less strong in favour of electoral and parliamentary reform.

It was no wonder then, that, when he stood for Oxford in 1780, he found his chances of success so small that he withdrew from the contest. His political views and leanings he had made known at various times in a fragmentary manner in his *Principles of Government*; *Plan of a National Defence*; *Enquiry into the Legal Mode of Suppressing Riots*; and other short essays, reprinted in the collective edition of his works. But though he was always writing and speaking in favour of liberty and free government, he was no party man, and was desirous, he said, of being transported 5000 leagues from all the fatal discord of contending politicians. His wishes were soon gratified. Through the influence of Lord Ashburton he was appointed, in 1783, a judge in the supreme court of judicature at Fort William in Bengal. On this occasion he was knighted, and a few weeks after these two-fold honours he married Miss Shipley, the eldest daughter of the Bishop of St Asaph. Not long before he set sail for India he had resumed his Oriental studies, and in 1782 had published an English version of the seven old Arabic poems known as the *Moallacah* or *Suspended*, so called from having hung on the walls of the great temple of Mecca, ever since the death of the prophet. On arriving in India he entered upon his judicial duties with all the advantages of a high reputation, unsullied integrity, disinterested benevolence, and unwearied perseverance. One of his first acts on landing, was to seek out such persons within his reach as had pursued a line of research similar to his own. These he formed into a society for inquiring into the history and antiquities, the arts, sciences, and literature of Asia. He was chosen the first president of this learned body, and after an interval of four years, that is to say, in 1788, saw through the press the first volume of its *Memoirs*. To these *Asiatic Researches*

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European scholars owe a very large share of their knowledge of the religion, antiquities, and history of the Hindus. The papers contributed by the president himself on these and kindred subjects were of immense value. Sir William's next care was to master Sanscrit, the law language of the country. Till his time the British judges had not seen fit to take this precaution; and thus important powers were vested in the pundits, who dealt out Hindu law as they pleased. To ensure the better administration of justice Sir William next offered to government to make a complete digest of Hindu and Mohammedan law, and to translate it when made. Government closed with the offer, and Jones began the work; which, however, he did not live long enough to finish. It devolved on Mr H. T. Colebrooke to carry out the imperfect design; and the *Digest of Hindoo Laws* was issued under his superintendence at Calcutta in 1800. This compilation was based on the famous ordinances of Menou or Manu, a very ancient Indian legislator. The ordinances themselves, containing a complete system of civil and religious duty, were translated by Sir William in 1794. Not the least valuable service which he rendered to Hindu literature, was his English version of the *Sucontala*, or *The Fatal Ring*, a dramatic poem of Kālidāsa. Nor should we overlook his translation of the *Hitopadesa*, the mine from which the celebrated fables of Pilpay are believed to have been taken. These literary occupations, severe and engrossing as they were, were only the "parerga" of Sir William's life. His primary duties were judicial; and he performed these with a laborious and conscientious exactitude beyond all praise. As his biographer remarks, "the inflexible integrity with which he discharged the solemn duty of his station will long be remembered in Calcutta, both by Europeans and natives." His unremitting labours at last undermined his health, and he was preparing to return to England, when a sudden illness, neglected at first, carried him off. He died at Calcutta, April 27, 1794, in the forty-eighth year of his age.

In the course of his comparatively short life Sir William Jones condensed an amount of hard and honest labour that seems scarcely compatible with the limited faculties of the human mind. His powers, however, were those of an acquirer and exponent rather than of an original thinker. Every thing that came before him to be learned he mastered with equal ease. Selecting languages as his special sphere, he mastered Greek and Latin, while Italian, French, Spanish, Portuguese, and German were almost as familiar to him as his mother-tongue. Of the Eastern dialects those in which he was most at home were Sanscrit, Arabic, and Persian. It may be doubted, indeed, if there ever was any European so deeply learned in the literatures of these tongues as he. Hebrew, Turkish, and even Chinese likewise fell within his range; while there were many other languages of which he had a great, though less thorough knowledge. Of his contemporaries Mezzofanti alone was his superior as a linguist; but in general force of mind, and in the power of making his knowledge available, either to himself or others, the Englishman was vastly superior to the Italian. His range was also infinitely wider. Had he devoted to the sciences the time and labour he bestowed on the languages, he would have attained equal eminence in them. As it was, he had a wide acquaintance with mathematics and chemistry; and in his latter years botany became a favourite study. "He seems to have acted," says his biographer, "on this maxim, that whatever had been attained was attainable by him; and he was never observed to overlook or neglect any opportunity of adding to his accomplishments, or to his knowledge. When in India his studies began with the dawn, and, in seasons of intermission from professional duty, to have been continued throughout the day. Meditation retraced and confirmed what reading had collected or investigation discovered."

Jonkoping He was very careful in his distribution of his time. Sir
Edward Coke had written—

"Six hours in sleep, in laws grave study six,
Four spend in prayer, the rest on nature fix."

Jones altered the distich thus:—

"Seven hours to law, to soothing slumber seven,
Ten to the world allot, and all to heaven."

It is much to be regretted that Jones did not concentrate his powers. Much as he certainly did make out of his vast attainments, he might have made far more, had he chosen, instead of continually increasing his stores, to think out and reason upon those already amassed. His intellectual force became weakened by diffusion over too great a variety of objects. His weakness manifests itself in his judgments of men and questions, as well as in his style, which is often languid and heavy. His numerous contributions to the *Asiatic Researches*, valuable and instructive as they are, owe more of their interest to their subject-matter than to their setting; and the same may be said of nearly all his writings that bear upon the East. Nor can it be fairly said that as a poet he has any claim to original genius. His verse is often lofty and sonorous, and is not without a certain nobility of thought. Sometimes it even glows with the semblance of passion. Even his best pieces, however, are not much more than showy rhetoric or brilliant imitation. But with all these deductions there remains a great deal in the writings of Jones that is worthy of our admiration. The man can never be estimated too highly. As a judge, as a scholar, as a citizen, and as a friend, there is hardly any Englishman of whom his country has greater reason to be proud.

In addition to the works already mentioned, Jones translated the speeches of Isæus on the Right of Inheritance at Athens, and two Mohammedan essays on the same subject, some of the *Tales and Fables* of Nizami, and considerable portions of the *Vedas*. There have been two complete editions of Jones' works, one in 6 vols. 4to, 1799, and the other in 13 vols. 8vo, 1807. To the latter of these was appended a life of the author by Lord Teignmouth, to which we are chiefly indebted for the facts of the foregoing narrative.

JONKOPING, a laen in the southern part of Sweden, bounded on the N. by Mariestad, Lake Wetter, and Linköping, E. by Kalmar, S. by Wexio, and W. by Halmstad and Wenersberg. Area 4275 square miles. A great part of the surface is rocky and mountainous, but other parts are of considerable fertility, producing grain sufficient for the wants of the people, as well as potatoes, hemp, flax, and buckwheat. It is rich in minerals, particularly iron, which is worked to a considerable extent. The woods are extensive and furnish deals, pitch, tar, and potash for exportation; cattle, butter, and cheese, are also among its exports. Pop. (1850) 163,426.

JONKOPING, the capital of the above laen, is situated at the southern extremity of Lake Wetter, 80 miles E. of Gottenborg. It is generally well built, with wide and regular streets; and has a handsome church, a guildhall, arsenal, theatre, and grammar school. Chief manufactures, woollen and linen goods, leather, and tobacco. Pop. 4742.

JONSON, BEN, an eminent English dramatist, the contemporary and friend of Shakspeare, was born at Westminster in 1573. His family was originally of the south of Scotland, no doubt cadets of the old border clan of Johnstone, of which the Lairds of Lochwood, ancestors of the Marquisses of Annandale, were the chiefs. His grandfather had migrated from Annandale to Carlisle, and afterwards entered into the service of Henry VIII. His father suffered confiscation and imprisonment under Queen Mary for his adherence to the Protestant faith; but living into the happy reign of Elizabeth, he became a preacher and

survived till 1573. Benjamin, or Ben (his own familiar abbreviation) was a posthumous son, born about a month after his father's decease. His mother's name has not transpired, but from an incident related by her son, she must have been a remarkable person, with more of the spirit of a Roman matron than that of an Englishwoman who had been a minister's wife. In 1604, Jonson, according to his own narration to Drummond of Hawthornden, was accused of writing, in conjunction with Chapman and Marston, against the Scottish nation, in a play named *Eastward Hoe*. Sir James Murray had laid a complaint on the subject before the king; and the report was that the offending dramatists would have their ears and noses cut. The charge was abandoned; and Jonson in congratulation of his escape, banquetted all his friends. Camden, Selden, and others were present, and "at the midst of the feast," he says "his old mother drank to him, and showed him a paper which she had (if the sentence had taken execution) to have mixed in the prison among his drink, which was full of lusty strong poison, and that she was no churl, she told, she minded first to have drunk of it herself." This high-spirited dame is said to have married again shortly after the death of Jonson's father, her second husband being a bricklayer, living in Hartshorn Lane (now Northumberland Street) Charing Cross. Fuller, who mentions this fact, does not give the second husband's name, but Malone and Gifford, finding that a Mrs Margaret Jonson was married in 1575 at St Martin's-in-the Fields (where Ben Jonson, when a child, is known to have attended school), to a man named Thomas Fowler, concluded that this was the marriage of Jonson's mother. Recent researches, however, prove that the Mrs Fowler married in 1575 was dead before 1595, whereas, Jonson's mother was living, as we have seen, in 1604. We have consequently yet to ascertain the name of Jonson's stepfather, if such a relationship really existed. All that he tells us himself is that he was brought up poorly, sent to school by a friend, and afterwards put to a craft which he could not endure. The school in which he was placed by the generous unnamed friend, was the famous Westminster School, then taught by Camden, the learned antiquary and historian, to whom Jonson has expressed his gratitude both in prose and verse. The disagreeable occupation to which he was removed was that of a bricklayer; and Fuller states that Ben assisted in building part of Lincoln's Inn, having a trowel in his hand and a book in his pocket. The trowel was soon thrown aside; Ben enlisted in the army and served during one or two campaigns in the Low Countries. In his epigram *To True Soldiers* he boasts that he did not shame the great profession of arms; and on one occasion, in the face of both camps, he killed an enemy and took *opima spolia* from him. On his return to England, he "betook himself," he says, "to his wonted studies." He is said to have entered himself of St John's College, Cambridge, but there is no evidence of his academical career, and the statement may have arisen from the fact that in advanced life, as a compliment to his scholarship and dramatic genius, he was created Master of Arts in both universities. In his lines addressed to Camden he emphatically says:—

"Camden, most reverend head! to whom I owe
All that I am in arts—all that I know."

Jonson was not the man to have concealed his university education had he received that distinction. Before he was twenty years of age he was married, and earning a precarious subsistence by acting at the Curtain Theatre in Shoreditch, and writing for the stage. At this time London and its suburbs swarmed with low theatres, and the licentious character of the performances led the privy council to issue orders for their suppression. The players, supported by the populace, kept up a constant war with the

Jonson,
Ben.

Jonson. civic rulers, but Jonson fortunately obtained a better field for the display of his dramatic talents. As an actor he seems to have failed. He was of too rugged and unbending a nature for that plastic profession, and his person would seem to have been unsuitable, as he mentions his "mountain belly and rocky face," the results perhaps of his subsequent deep potations of Canary. In 1598 his comedy of *Every Man in his Humour* was performed by the Lord Chamberlain's servants at the Globe Theatre. Shakspeare was one of the original performers, and, according to a tradition mentioned by Rowe, it was in consequence of his friendly recommendation that the play was accepted and brought on the stage. The peculiar merits of this comedy and the leading characteristics of Jonson's dramatic genius, have already been described by one to whom universal homage is due (see the article *DRAMA*), and we need only remark that before the appearance of this first play of Jonson's, English comedy can scarcely be said to have existed. Shakspeare drew none of his scenes from the domestic life and manners of his countrymen, and the delineations of Nash, Greene, and other contemporary dramatic writers, were either gross caricatures or lifeless inanities. Jonson gave the true form and pressure of English society, in which individual character was developed and a succession of natural and probable incidents represented. "He had learned the principles of comedy," says Mr Hallam, "from Plautus and Terence;" true, but his adaptation of those principles to English characters and manners was the happy conception of genius wrought out with consummate skill and judgment. Jonson never improved upon his first work. His *Bobadil* and *Kitely* are his most successful inventions in the way of comic portraiture; and though his later comedies,—*The Alchemist*, *Volpone*, or *The Fox*, and *The Silent Woman*,—display greater affluence of dramatic powers and language, and a wider range of character and incident, they depart wholly from the simplicity of nature, and are disfigured by pedantic and over-laboured description.

The brilliant commencement of Jonson's career as an author was clouded by an event which threw him into prison, and almost brought him, as he said, to the gallows. He quarrelled with a brother actor named Gabriel Spencer; a duel ensued, and Jonson killed his antagonist, though the latter, as he stated, was provided with a sword 10 inches longer than his own. Henslowe, a theatrical manager, writing to his son-in-law, Edward Alleyn (the successful tragedian and founder of Dulwich College), on the 26th of September 1598, thus quaintly describes the unfortunate accident:—"Since you were with me I have lost one of my company, which hurteth me greatly,—that is Gabriel; for he is slain in Hoxton Fields by the hands of Benjamin Jonson, bricklayer." This allusion to Jonson's former employment was no doubt made in contempt of the successful duellist, who was an inferior actor to Spencer. In prison Jonson was visited by a Roman Catholic priest, who converted him to the Romish Church, and he remained in that communion twelve years. His literary studies seem not to have been interrupted by his incarceration, which probably did not last long. In 1599 he produced his *Every Man Out of his Humour*, a comedy which attracted Queen Elizabeth to the theatre; and in 1600 and 1601 two other plays proceeded from his ready pen—*Cynthia's Revels*, and *The Poetaster*. In the latter he satirised his contemporaries, Decker and Marston; and Decker retaliated by a counter-satire, *The Satiromastix*, or *the Untrussing of a Humorous Poet*. The angry dramatists were, however, soon reconciled; and, on the accession of James I., when Jonson was desired by the court and the city to prepare a masque or pageant for the reception of the king, he selected Decker as his associate in the task. Previous to this (1603) Jonson's tragedy of *Sejanus* was brought out at the Globe

Theatre, and Shakspeare is again mentioned as one of the performers (the last time that his name occurs as an actor). Jonson's tragedy was ill received by the audience. He had copied largely from Tacitus, to evince his "integrity to the story," as he relates, and to save himself from those "common torturers" who criticised his plots, and whom he compares to swine rooting up the muses' gardens. The torturers, however, were not propitiated by this sacrifice to historic truth, for *Sejanus* suffered nearly as much violence from the London audience as its subject did from the rage of the people of Rome. Some one had assisted Jonson in the composition of the tragedy; he threw out the contributions of this unknown "second hand," and the play being remodelled, was brought out with success. It is a heavy but grand and imposing classic drama.

The reign of James was eminently propitious to the stage. A few days after his arrival in London the king took the Lord Chamberlain's players into his pay and patronage; the queen adopted the Earl of Worcester's company; and Prince Henry that of the Lord Admiral. The new sovereign, as appears from Mr Peter Cunningham's *Extracts from the Accounts of the Revels at Court* (Shakspeare Society, 1842), saw five times as many plays in a year as Queen Elizabeth was accustomed to witness. Jonson, though unfortunate in his play of *Eastward Hoe*, atoned for the imagined insult to royalty and Scotland by assiduous and successful court to James, and participated liberally in his majesty's bounty and favour. Between the years 1605 and 1618 he appears to have been incessantly employed either in the production of what may be termed legitimate dramas, or in the preparation of masques for the court and principal nobility, in which his classic impersonations and fine lyrics were aided by music and machinery, and by the effects of splendid dresses and decorations. In these courtly entertainments Jonson was assisted by the inventive and artistic skill of Inigo Jones. During the period we have mentioned Jonson produced his *Volpone*, or *The Fox* (1605); the *Silent Woman* (1609); *Catiline*, a classic tragedy resembling his *Sejanus* (1611); *Bartholomew Fair* (1614); *The Devil is an Ass* (1616); and his masques of *Blackness*, of *Queens*, of *Beauty*, *Oberon*, *Christmas*, &c. Of Jonson's remuneration from these gorgeous masques, we have no account. The cost of *Oberon*, or *Prince Henry's Masque*, is given in the *Court Revels*, and it appears to have amounted to no less than L.1412, 6s. 10d. The mercers and silkeners have the principal share; and, while only L.16 were awarded to Inigo Jones as "deviser," the tailors' bill was L.142, 13s. 6d. As long as King James lived Jonson produced a masque every year on *Twelfth Night*, and received a pension of 100 merks. He was now at the height of his popularity as a dramatist, though experiencing frequent reverses as to public favour and the reception given to his plays, all of which he affected to despise and condemn. He bore himself loftily to the world, but had gathered round him a knot of young admirers, of whom he was the assumed poetical father, and who were said to be "sealed of the tribe of Ben." The scene of their festivities was a great room, "The Apollo," in the Devil Tavern, near Temple Bar; and the *Leges Conviviales*, or rules of the club, were drawn up by Jonson in Latin, and painted in gold letters on a board over the chimney-piece. (This curious relic is still preserved in the Messrs Child's banking-house.) Jonson was also a frequenter of the Mermaid Tavern in Friday Street, where he had higher intellects to contend with, as Shakspeare, Beaumont, and Fletcher, Selden, Carew, Donne, Raleigh, &c. The joyous meetings of the Elizabethan wits have been immortalized by Beaumont in the well-known lines addressed to Jonson, commencing—

"What things have we seen
Done at the Mermaid! heard words that have been
So nimble and so full of subtle flame," &c.

Jonson. Viewing in fancy these "wit contests," Fuller compared Jonson to a Spanish great galleon, and Shakspeare to an English man-of-war. "Master Jonson, like the former, was built far higher in learning; solid but slow in his performances. Shakspeare, like the latter, lesser in bulk, but lighter in sailing, could turn with all tides, and take advantage of all winds, by the quickness of his wit and invention." Who but must regret that the Mermaid had not a Boswell to give these scenes a life through all ages?

In 1613 Ben Jonson visited France in the capacity of governor to Sir Walter Raleigh's son. This was an office for which the dramatist's habits peculiarly unfitted him; and he related himself that the "knavish youth" on one occasion caused him to be drunken, laid him on a car, and had him drawn by pioneers through the streets, at every corner showing his governor stretched out! While in Paris he was introduced to Cardinal du Perron, who showed him his translations of Virgil, on which Ben pronounced the commendous criticism that "they were naught." In 1618 he undertook a more memorable journey to Scotland, resolving to walk all the way both going and returning; which feat,—remarkable in a man forty-five years of age, and of bulky frame,—he successfully accomplished. He spent some months in Edinburgh and Leith, and towards the close of the year went on a visit to Drummond of Hawthornden. In the course of conversation, Jonson, over his cups, was characteristically free in his strictures on his contemporary poets, and in relations of his own adventures and opinions. Drummond took notes of the table-talk of his distinguished guest, for which he has been accused of treachery, "discrediting the name of poet," says Mr Procter (Barry Cornwall), "and tarnishing the hospitality of his hospitable country." Gifford had before branded the Scottish poet with "malignity," and Sir Walter Scott had undertaken his defence. A complete copy of these *Notes* was published in 1842, edited by Mr David Laing; and, so far from condemning Drummond, we are disposed, with Mr Hallam, to thank him for so much literary anecdote, only regretting that his industry had not been equal to his curiosity and fidelity, and that he had not accompanied Jonson's revelations with explanatory circumstances. Drummond never published the *Notes*, though he survived his visitor a period of twelve years; and this fact should of itself relieve his memory from the charge of being a traitor to his friend and guest. In these private memoranda Jonson does not appear to advantage. He was vain, boastful, and censorious; and these defects, exaggerated by the influence of wine, concealed the nobler qualities which appear in his poetry and animated his conduct. To Shakspeare, whom he has been accused of envying and maligning, he has devoted the highest and most discriminating tribute of love and admiration. Jonson intended to have described his journey to Scotland, and written a "fisher play" on Loch Lomond. He had collected materials from Drummond and others, but his manuscripts were destroyed by a fire in his house, on occasion of which he poured forth hearty execrations on Vulcan. His spirit was indomitable; never was a more laborious literary workman, despite his convivialities, but he seems to have been deterred from resuming his Scottish task, so unfortunately interrupted.

Evil days came with advance of years. In 1628 Jonson was struck with palsy, and he seems to have been at first neglected by the new sovereign, Charles I. He alluded to his necessities and sufferings in the epilogue to his play, *The New Sum*. The audience ungenerously hissed the play, but the king sent the dramatist a present of L.100. Thus encouraged, Jonson ventured to solicit, as a compensation for the unjust censures and bad taste of the age, that his yearly pension of 100 merks should be raised to pounds, and Charles granted the petition. He added also what was perhaps not less welcome, a tierce of Jonson's favourite

Canary wine, which was continued yearly during his life, and descended to his successors, the poets-laureate. The annual stipend and tierce of Canary, with the produce of plays and masques, should have secured comfort to the poet's declining years; but Ben was an improvident and bountiful liver. In December 1631 he is found petitioning his generous patron, the Earl of Newcastle, for such bounty as he could spare, "in the name of good letters;" and he enforced his claim by stating that "the barbarous court of aldermen had withdrawn his chandlery pension of L.33, 6s. 8d." Disease had not prostrated his intellect; in 1632 and 1633 he produced two comedies and two masques, which, though ranked by Dryden among Jonson's *dotages*, are not inferior to some of his early productions. His last work was an unfinished pastoral drama, *The Sad Shepherd*; a beautiful and highly poetical pastoral, the precursor and prototype of Fletcher's *Faithful Shepherdess* and Milton's *Comus*. Thus, in every department of poetry except the epic, Jonson challenged and won success, if not from his contemporaries, at least from posterity. His irrepressible pedantry and overcharged "humours," with the grossness which was the vice of his age, repel ordinary readers from his plays, and have banished them from the stage; but his masculine sense, wit, observation, and fancy (the last abounding in his exquisite lyrics and minor poems), constitute his right to be considered a great original master in our literature, and as second only to Shakspeare. He died August 6, 1637, and was buried in Westminster Abbey. A pavement stone marked the spot, inscribed "O RARE BEN JONSON;" which was done, says Aubrey, "at the charge of Jack Young (afterwards knighted), who, walking there when the grave was covering, gave the fellow eighteen pence to cut it." This stone has since been replaced by an uninteresting square, the work of some dull son of earth, a lover of uniformity; but the brief and pregnant inscription can never be forgotten, and supersedes any more elaborate epitaph. (R. C.—S.)

JOORIA, a populous and thriving sea-port of Hindustan, in the Gujerat peninsula, belonging to the rajah of Amram. It is situated on the Gulf of Cutch, twenty miles below Wowamia, and carries on a considerable traffic with Mandavee, and others places in the Gulf of Cutch, and on the western coasts of India, Persia, and Arabia, and occasionally with Bombay. Its exports consist chiefly of cotton, ghee, oil, and hides, to the southward, and coarse cloth for Persia and Arabia. In return it receives spices of all sorts, powder, lead, and cocoa-nuts. In 1808, the rajah and principal inhabitants agreed with the Bombay government not to permit or connive at piracy, and also to abstain from plundering persons in distress. E. Long. 70. 22., N. Lat. 22. 40.

JOPPA. See JAFFA.

JORDAENS, JACOB, a celebrated Flemish painter, was born at Antwerp in 1594. He studied under Adam van Oort, but his real master in the art of painting was his fellow-student Rubens. His marriage, at a very early age, with Van Oort's daughter prevented him from visiting Italy as he had intended; but the master-pieces of Titian, Paul Veronese, Caravaggio, and others, then to be seen in the Flemish galleries, gave him a perfect knowledge of the Italian schools without quitting his native country. Many of these *chef d'œuvres* were copied by him with such force and beauty that Rubens entrusted him with the execution, on a large scale, of many of his small sketches. These were afterwards touched up by the great master, and many of them now pass under his name. In many respects Jordæns's pieces bear a great resemblance to those of his friend; and it is believed that, after Rubens, he is the greatest painter in that style of the Flemish school. There is in both the same abundance of ideas, the same knowledge of *chiar-oscuro*, the same warmth of colouring, truth to nature,

Jooria
||
Jordaens.

Jordan
||
Joseph.

and energy of expression; but Jordaens wants the dignity of thought, and is inferior in the choice of forms, the character of his heads, and correctness of drawing. His taste is also not unfrequently defective. Jordaens painted with great rapidity, and, as he lived to a great old age, his works are very numerous. Many of his pieces are preserved in the churches of the Netherlands; and the public galleries of Saxony, France, Sweden, and England, and some of the private collections in the last-named country, contain admirable specimens. Jordaens died at Antwerp in 1678, in his eighty-fifth year. Dr Waagen, in his *Art Treasures of Great Britain*, criticises many of Jordaens' pieces, which he found in all the best private collections in England.

JORDAN. See PALESTINE.

JORTIN, JOHN, D.D., an English divine and miscellaneous writer, whose learning and literary accomplishments have been as unjustly overlooked by posterity as they were ill-rewarded in his own day, was born at London in 1698. His father, a French Protestant of Brittany, had come to England in quest of that religious freedom which was crushed in France when the edict of Nantes was revoked. Educated at the Charter House, he passed thence, in due course, to Jesus College, Cambridge; took his first degree in 1719; was soon after made a fellow of his college; and, in 1722, graduated as M.A. About this time he published, under the title of *Lusus Poetici*, a small volume of Latin poems, which were greatly admired, and are still fairly entitled to rank high among modern efforts of the kind. His merits were rewarded by his college with a living in the country; but after his marriage he fixed his abode in London, where he became known as a highly popular and useful minister. The sermons which he wrote and published during this period are quite memorable for their acuteness of thought and racy freshness of style. Retiring for a time to Eastwell in Kent, to the living of which he had been presented by the Earl of Winchelsea, he was again drawn to London, where, in 1751, he was made rector of St Dunstan's-in-the-East, by his friend Archbishop Herring. Four years later the same influence procured for him the degree of D.D. In 1762 his friend Dr Osbaldiston, promoted in that year to the bishopric of London, made Jortin his domestic chaplain, and besides the living of Kensington, obtained for him a prebendal stall in St Paul's. On being made, in 1764, archdeacon of London, Jortin declined various promotions that were afterwards put in his gift. Fixing his residence at Kensington, he remained there till his death, September 5, 1770, and was buried in the new churchyard of that place.

Jortin's most important works were his *Miscellaneous Observations upon Authors, Ancient and Modern; Remarks upon Ecclesiastical History*; and a *Life of Erasmus*. Besides these, however, he wrote many miscellaneous criticisms,—such as those on Spenser, Milton, Tillotson, Cardinal Pole, Seneca, and others. All these works display a great amount of curious learning, besides a singular acuteness of thought, expressed in terse, and often forcibly eloquent language. A play of gentle satire gives a piquancy and zest to them that keeps up and heightens the interest. The *Life of Erasmus* is based on that by Le Clerc in the *Bibliothèque Choisie*, and embodies a mass of notes and digressions on the literary and ecclesiastical history of that period. Though it can hardly be called a finished life of Erasmus, it affords a mine of rich material, from which a life worthy of the man might be constructed.

JORULLO, a volcano of Mexico. See MEXICO.

JOSEPH, the name of two princes of the house of Hapsburg, emperors of Germany in the eighteenth century.

JOSEPH I., son of Leopold I., was born in 1678, mounted the throne of Hungary in 1689, and was soon after crowned king of the Romans. In 1705 he succeeded his father as Emperor of Germany. Besides the imperial dignity, he in-

herited the war of the Spanish succession, which, begun in 1701, outlasted the whole period of his reign. Studious, tolerant, pious, and humane, he was of too gentle, perhaps weak, a spirit, to interfere personally in the conduct of the war, yet success everywhere attended his arms and those of his allies. Marlborough and Eugene shared between them the honours of Ramillies, Oudenarde, and Malplaquet; and these victories, combined with the surrender of Naples, the rescue of Turin, and the progress of the Archduke Charles in Spain, seemed to have settled the question in favour of Austria. In the midst of these successes, however, Joseph died, rather suddenly, of small-pox, April 17, 1711, and bequeathed the war and the crown to his brother Charles.

JOSEPH II., the eldest son of Maria Theresa and Francis duke of Lorraine, was born March 13, 1741, was elected king of the Romans in 1764, and, on the death of his father in the following year, became emperor of Germany. During his mother's lifetime, he was nominally a co-regent with her in the hereditary states of the house of Austria, and held the command in chief of the army. But his real power was small, as the empress-queen kept in her own hands the administration of her vast dominions. Much of his time was spent in travel, both in his own and adjoining countries. More than once he visited the hereditary enemy of his house, Frederic of Prussia, for whom he cherished an unbounded admiration, and whom in his subsequent political career he seems to have copied, or at least imitated, as his model. Mounting the Austrian throne on the death of Maria Theresa in 1780, he gave a loose to that spirit of innovation and reform which gained for him the title of imperial avant-courier of the French revolution. His reign naturally falls into three epochs of innovation, organization, and restoration. The first period, from 1780 to 1783, was given up to experimental failures. The next three years were devoted to useful governmental reforms. The third and last period was occupied in retracing most of the steps which he had taken in the previous periods, more especially in the first; and the close of it was marked by the revocation of the various edicts by which he had abolished the constitutional liberties of the several parts of the empire. Uniformity became his ruling passion, and to establish it he did not hesitate to overturn and destroy the historical and political peculiarities of the various nations under his sceptre. Declaring that he alone understood the wants of the country, he issued edict after edict, many of them in the highest degree praiseworthy in their object, but arbitrary and despotic in their operations. Disregarding the various nationalities, he parcelled out his dominions into thirteen governments, and subdivided these into circles, establishing in each a uniform civil and judicial administration. He established general toleration in religious matters, suppressed many convents, withdrew the censorship of the press from the clergy, and forbade papal bulls to be published in his realms without the sanction of the government. The Jews were not only permitted to follow whatever calling they chose, but had access allowed them to the colleges and universities. As all these changes were introduced in total disregard of individual and local rights and privileges, they excited in many places a feeling of hatred which at last found vent in rebellion. His attempts to force the German tongue on his Hungarian subjects led to a revolt, of which he did not live to see the end. A similar indiscretion cost him his valuable Belgic provinces. These disasters, combined with the doubtful issue of the Turkish war, in which he took part along with Russia, preyed upon his mind, and cut him off in the midst of his career, February 20, 1790. See AUSTRIA.

JOSEPHUS, FLAVIUS, the celebrated Jewish historian, was born at Jerusalem, A.D. 37, in the first year of Caligula, and four years after the ascension of our Lord. His advantages of birth were very considerable. His father

Joseph II.
||
Josephus.

Josephus. Matthias, sprung from the highest priestly family, belonged to the first of the twenty-four courses. On his mother's side he was descended from the Asmonæan princes. He was very proud of his high birth; and it was a theme on which he used to dwell with a delighted complacency. He complained bitterly of some malignant persons who had ventured to laugh at his claims to an aristocratic lineage. The wealth and high standing of his parents procured for him the best Jewish education. Such was his progress—at least if his own account of himself is to be believed—that at the age of fourteen he was often consulted by learned rabbis on abstruse points of the Jewish law. At the age of sixteen he began to study with peculiar care the doctrines of the three leading Jewish sects, the Pharisees, Sadducees, and Essenes. Though a Pharisee by birth, and in later life a Pharisee both by belief and temperament, he seems at this period to have inclined to the views of the Essenes. Hearing at least that Banus, a celebrated member of that sect, was living in the wilderness with the rigorous asceticism of a hermit, he joined him, and remained under his teaching for three years. Whatever his real creed was, on his return to Jerusalem he allied himself with the Pharisees, and remained faithful to them ever after. At the age of twenty-six he set out for Rome to intercede for some priests of his acquaintance, whom Felix, the procurator of Judea, had sent to be tried there on some trifling charges. Landing safely at Puteoli after a very narrow escape from death by shipwreck in the Adriatic, he gained the friendship of Aliturus, a famous mime of that day, and a favourite of Poppæa, the wife of Nero. Through the good offices of this actor, Josephus not only obtained the pardon of his friends, but was rewarded with many valuable gifts by the empress. On his arrival in Judea, Josephus found his countrymen bent at all hazard on throwing off the Roman yoke. Knowing well the resources of Rome and the hopelessness of successfully resisting her power, he did his best to dissuade the Jews from their mad attempt. His efforts were thrown away; and though he was well aware that the struggle could only issue in the ruin of his country, he determined to share her fall. His own talents for administration were by this time well known, and to him was assigned the task of governing and defending the province of Galilee. His appointment was violently opposed by a strong party in the Sanhedrim at Jerusalem, headed by John of Giscala, who intrigued against him, opposed his policy, and even tried to take his life. But Josephus having fortified the chief cities, and trained his subjects to war, repelled with ease the first attack of the Romans, and this gained the affection and confidence of the Galileans. This success, combined with his own skill in diplomatic manœuvring, enabled him to crush, or at least to defy his enemies in the state. Meanwhile the Romans had assembled a large force; and, in A.D. 67, entering Palestine with Vespasian at their head, laid the whole country in ashes as they advanced. Hopeless of success, and abandoned by the authorities at Jerusalem, Josephus still tried to make head against the foe. Throwing himself into Jotapata he roused the inhabitants to desperate resistance, and conducted the defence of the town for forty-seven days. At the end of that time the town was stormed, and such of the garrison as had not perished in the siege were put to death by the conquerors. When it came to the governor's turn to die, he demanded to be led into the presence of the Roman general. With great adroitness he assured his captor that he was no chance prisoner, but had been commissioned from heaven to foretell that he was shortly to become the sole head of the Roman empire. Vespasian, finding that Josephus, who had predicted the exact number of days that the siege would last, was looked upon as a prophet, spared his life, and even loaded him with valuable presents. He kept him in close confinement, however, for three years, and even

then only set him free on the urgent instance of Titus. Josephus. When the siege of Jerusalem was begun, Josephus who had accompanied his patron Titus on the expedition, tried to persuade his countrymen to yield; but he was treated by them with scorn as a renegade, and even with the Roman soldiers he was very far from popular. When the city fell, Titus offered to grant any favour he might ask. Josephus asked for the lives of his brother and fifty friends, and begged that the sacred books be spared. Besides his request he obtained a valuable estate in Judea, and on returning to Italy with his patron was rewarded with the freedom of the state, a large annual pension, and a house originally occupied by the emperor himself, in compliment to whom he assumed the name of Flavius. Under Titus and Domitian he was confirmed in all his privileges. The remainder of his life was spent chiefly at Rome in literary pursuits. The exact date of his death is not known. He was alive very near the close of the first century, and probably survived a few years of the second.

Josephus was three times married. His first wife was a captive virgin, whom he espoused at the instance of Vespasian, but appears to have subsequently divorced. His second was an Alexandrian lady, whom, he says, "I forsook because her manners pleased me not, though she was the mother of my three children." His third was a Jewess born of a noble Cypriote family, and, as he himself says, "endowed with as laudable manners as any other woman whatsoever." By her he had two sons, Justus and Simonides Agrippa.

Josephus' character was a strange mixture of strength and weakness. His great abilities for administration, both in peace and war, were acknowledged by his countrymen, and proved in his public career. The manner in which he maintained himself in his province of Galilee, perfected his military organization, and conducted the defence of Jotapata, has been already described, and puts beyond doubt his courage as well as his skill. But though he is undoubtedly entitled to great praise for these exploits, his insatiable vanity appears in every line of his narrative, and seduces him into displays of the most amusing vainglory. From the very first he seems to have been spell-bound by the power and majesty of Rome, and to have lost that faith in the destiny of his own people without which there can be no true patriotism. Since he could not check the progress of the Romans, he could at least hope to reach eminence by making himself useful to them. Hence his mean truckling to the emperors, and his flattery of the great nobles whom he met at court,—a flattery so gross as sometimes to fall little short of blasphemy. What his religious creed was, is exceedingly difficult to decide. In a famous passage in his *Antiquities of the Jews*, first quoted by Eusebius, he speaks of Christ as something more than human, and attests his miracles, death, and resurrection. The authenticity of the passage has been very much disputed. If it be admitted (and the external evidence in its favour is very strong), then Josephus must have been a Christian. On the other hand, the common belief that he was not a Christian condemns the passage as spurious. But it happens that Josephus nowhere else in all his writings commits himself in favour of Christianity. As an impartial historian he could not but accept it as an historical fact; yet even though he may have believed in its truth, he was too sceptical and indifferent to make himself a martyr for the sake of any truth or doctrine whatsoever. It is most probable that the passage in question, without being absolutely spurious, has been modified into its present form by Eusebius, who is well known to have often taken such a liberty in his quotations. As a historian Josephus possesses many valuable qualities. His diction is for the most part purely classical, and his narrative is so clear, lively, and vigorous, as to have earned for him, with some show of reason, the title of the Greek Livy. He claims for himself the merit of strict faithfulness, and under

Joshua
Joudpoor.

certain limitations he deserves it. His most important works are his *History of the Jewish War*, and his *Antiquities of the Jews*. The first of these was originally written in the Chaldo-Syriac tongue for the sake of the Jews dwelling beyond the Euphrates, and was afterwards translated by its author into Greek. It is divided into seven books, and gives the history of the Jews from the taking of the city by Antiochus Epiphanes to its destruction by Titus. The second was written in Greek and was published in A.D. 93. It consists of twenty books, and is dedicated to Epaphroditus, a Roman philosopher of that day. Commencing with the creation of the world, it details the history of the Jews in a continuous narrative from the birth of Abraham to the beginning of the war with Rome. Much of it is taken from the Old Testament; but on the main stem of the narrative many traditions have been grafted, chiefly for the purpose of magnifying the importance of his countrymen with the Romans and refuting many of the calumnies against them. His other works are—an *Autobiography*, and two books *Against Apion*, in which he answers the charges brought against the earlier part of his *Antiquities*. The authenticity of this part of the work had been doubted, on the ground of its being passed over in silence by the Greeks.

The best editions of Josephus are those of Hudson, Oxford, 1720; Havercamp, Amst., 1726; Oberthür, Leipzig, 1782-85; Richter, in the *Bibliotheca Patrum*, Leipzig, 1826; and Dindorf, Paris, 1845.

Josephus has been translated into most of the European tongues. Of the English versions may be mentioned those of Lodge; Lestrangle, Lond., 1702; and Whiston, Lond., 1737. The French translation is by Gillet, Paris, 1756; and the Italian by Angiolini, Verona, 1779. There are several German translations; one by J. F. Cotta, Tübingen, 1736; another by J. B. Ott, Zurich, 1736; and the *Jewish War* by J. B. Frise, Altona, 1804-5.

JOSHUA, the assistant and successor of Moses, was the son of Nun, of the tribe of Ephraim. According to the *Tsemach David*, he was born in Egypt, in the year of the Jewish era 2406 (B.C. 1537). In the Bible he is first mentioned as being the victorious commander of the Israelites in their battle against the Amalekites at Rephidim. He distinguished himself by his courage and intelligence during and after the exploration of the land of Canaan, on which occasion he represented his tribe, which was that of Ephraim (Num., xiii., xiv.). Moses, with the Divine sanction, appointed him to command the Israelites, even during his own lifetime. After the death of Moses he led the Israelites over the Jordan, fortified a camp at Gilgal, conquered the southern and middle portions of Canaan, and also some of the northern districts. But the hostile nations, although subdued, were not entirely driven out and destroyed. In the seventh year after entering the land, it was distributed among the various tribes, who then commenced individually to complete the conquest by separate warfare. Joshua died 110 years old (B.C. 1427), and was buried at Timnath-serah on Mount Ephraim. There occur some vestiges of the deeds of Joshua in other historians besides those of the Bible. Procopius mentions a Phœnician inscription near the city of Tingis in Mauritania, the sense of which was—"We are those who fled before the face of Joshua the robber, the son of Nun" (*De Bell. Vandal.* ii. 10). Suidas—"We are the Canaanites whom Joshua the robber persecuted." Compare Fabricii *Codex Pseudepigraphus Veteris Testamenti*, i. 889, sq., and the doubts respecting this statement in Dale, *De Origine et Progressu Idolatriæ*, p. 749, sq.

JOUDPOOR, or MARWAR, an extensive rajpoot principality of Hindustan, bounded on the N.W. by Jessalmere, on the N. by Bikaner, on the E. by Jeypoor, Ajmeer, and Mewar, on the S. by Oodeypoor, and on the W. by the Runn of Cutch and Scinde. It lies between the 25th and

28th degrees of N. Lat., and has an area of 35,672 square miles. The southern and eastern parts of Joudpoor are fertile, being watered by streams that flow from the mountains. They are chiefly cultivated by Jauts, and they produce wheat, barley, and other kinds of grain common in India; also cotton, sugar, &c. The western portion of the country consists principally of desert or pasture lands, on which is bred a hardy race of horses, camels, and cattle. There are also lead mines in the country. The imports consist of cloth, shawls, spices, opium, rice, sugar, steel, and iron. The exports are salt, camels, bullocks, and horses. The principal inhabitants of Joudpoor are Rhatore rajpoots, who are a brave, handsome race of men, of the purest castes. The rajahs of Oodeypoor, Jeypoor, and Joudpoor formerly enjoyed considerable power and consequence, and their alliance was much sought after by the Mogul emperors of Hindustan. The country is described as having been much more populous in ancient times.

The rajahs of Jeypoor and Joudpoor were employed with their followers in the imperial armies, and attained the highest military rank till the time of Arungzebe, who attempted to enforce the capitation tax on his Hindu subjects, and sought to obtain possession of the children of the rajah Jerwont Sing, who died in the year 1678; a circumstance that gave rise to a war, in which the rajpoots were ultimately victorious, and, after the death of Arungzebe, they only paid a nominal allegiance. Being afterwards weakened by dissensions amongst themselves, they became tributary to the Mahrattas, and were only delivered from their yoke by the British in their successful war against the Pindaries. In 1818 a treaty was concluded between the maharajah of Joudpoor and the British, under which the former became tributary to the paramount power, and bound himself to afford military aid when required. At a later period the chief of Joudpoor suffered his tribute to fall into arrear, supplied the stipulated military assistance reluctantly and tardily, protected plunderers, and was believed to have entered into political correspondence having objects hostile to British interests and influence in India. These acts of misconduct were submitted to with great forbearance for a long period, during which the misgovernment and distraction of the country were extreme; and at length, from all these causes, it was deemed necessary to send a mission to Joudpoor demanding reparation. The mission proving ineffectual, a body of troops was moved to enforce that which negotiation had failed to achieve. Their approach alarmed the rajah, who forthwith displayed tokens of submission. The immediate consequences were, the establishment of a council of regency, with a British agent at its head, to carry on the government in conjunction with the rajah. A variety of useful reforms followed. The rajah died a few years after the commencement of the system which led to these beneficial steps, but they were pursued by his successor, Tukht Singh of Ahmadruggur, who was elected to the vacant throne by the feudal chiefs. The administration being thus confided to able hands, the British withdrew from further interference in the internal affairs of Joudpoor.

(E. T.)

JOUDPOOR, a fortified city, and capital of the above principality, is well built, mostly of stone. It is situated on a hill; and carries on a considerable traffic, by means of caravans, with Gujerat and the Deccan. E. Long. 73. 8., N. Lat. 26. 19.

JOUFFROY, THEODORE-SIMON, an eminent French philosopher, was born in 1796 at the village of Pontets, near Mouthe, a town situated on the verdant slopes of the Jura Mountains. As soon as he was able to read, he perused with avidity the pages of Rollin's *History of Rome*, and was to be found in the fields fighting over again the great battles of antiquity, by means of opposing rows of stones, arranged so as to represent the position of the hostile armies.

Joudpoor
Jouffroy.

Jouffroy. At the age of ten he was placed under the care of one of his uncles in the College of Pontarlier, and afterwards removed to that of Dijon, where his skill in French composition attracted general notice. Some fragments of a five-act tragedy, which he composed at this early age, have been preserved among his papers. His precocious talents procured him admission to the Normal school, in which, at the age of twenty, he was appointed tutor in philosophy. He was shortly afterwards appointed to the chair of philosophy in the Collège Bourbon, from which, after a three years' tenure of office, he retired. When the Normal school was closed in 1822, Jouffroy opened in his own house a private course of lectures, embracing the whole range of the philosophical sciences, and began to write extensively on politics, literature, and even natural history, for the periodical press. In 1826 he gave to the world his translation of Dugald Stewart's *Sketches of Moral Philosophy*, with a preface on the distinction between the facts of consciousness and those of the senses. Two years later he resumed his lectures on the history of ancient and modern philosophy in the Normal school, which had been reopened under a new name. The professorship of Greek philosophy and literature in the College of France was his next preferment, and he shortly afterwards entered the arena of politics as a member of the Chamber of Deputies. The duties of these multifarious offices undermined his constitution so seriously, that, not long after his reception into the Academy of Moral Science, he found it necessary to retire to Italy for the benefit of his health. Here he employed his time in completing the translation of Reid's works, the first volume of which had been published eight years before, in 1828. In 1838 he quitted the College of France to occupy the post of librarian of the university, and in 1840 he was summoned by Cousin to assist the Royal Council of Public Instruction. Meanwhile, his health, never robust, again began to give way, and after two years of continually increasing infirmities he died in February 1842, in the forty-seventh year of his age.

In the philosophy of Jouffroy we find, as in that of the Scottish school, a rational appeal to consciousness as the broad basis upon which the inquirer builds his superstructure. The grand object of his observations and speculations is man; and, adopting the most simple division, he views this moral being in a threefold aspect,—as having existed, as now existing, and as destined to exist hereafter. That he is destined to a future existence is deduced from a consideration of his nature. "Every being," says Jouffroy, "is predestined to a certain end, and that of man is indicated by the instinctive and primitive tendencies which result in knowing, acting, and loving." From the blind impulses of childhood he rises till he comes under the dominion of reason, in so far as regards the government of self, and thence to the still higher elevation of submission to universal order, in which we have the central point, the leading maxim of Jouffroy's ethical system. "The beautiful is order expressed, the true is order thought, and the good is order accomplished." All conflicting claims are to be determined by the answer to the question which involves the greatest amount of good, for that must be accordant with universal order. As we rise from this last to the notion of God, the author of order, it follows that morality and religion are different names for obedience to universal order. But in speaking of good, and the greatest amount of good, the old question arises, whence have we evil? The answer to this brings us to the Theodicee of Jouffroy, or scheme in which he defends the Divine government. Evil, according to him, is to be regarded as an obstacle in the path of man, necessary for the development of those very characteristics which make him what he is,—a being possessing liberty and personality. He even ventures to take his station upon the slippery, if not untenable ground, that the difference between man and the lower

animals consists in this, that while the latter are born and die animals, the former is born animal and dies a free being.

The psychological system of Jouffroy is developed in connection with the second of the leading divisions with which we started,—man as at present existing. Here again we have a simple threefold division into the soul as an intellectual agent, as desirous of action, and as it is *per se*, *i.e.*, apart from the foregoing manifestations. As the source of intelligent acts, whether voluntary or involuntary, the soul possesses the two faculties of observation and reason (the former dividing itself into consciousness, external perception, and memory), and, by affording the knowledge of contingent truths, causes the development of reason, by which we reach the knowledge of absolute and necessary truths. To the soul, as acted upon and determined to will, Jouffroy applied the peculiar term *receptivity*, as he applied the term *productivity* to the soul in the aspect under which we have just been considering it. As liable to be acted upon, the *ego* is exposed to an irritation which, according as it is agreeable or the reverse, produces love, which is a positive desire, or hate, which is a negative desire,—desire being the last simple phenomenon of sensibility, and the only thing which can determine the soul to will. Putting out of view all the phenomena included under the productivity and receptivity of the *ego*, Jouffroy brings us to the *ego* itself, which is a force intelligent, free, simple, and always the same. The distinction between soul and body, or, as he preferred expressing it, the distinction between physiologic and psychologic life, was with him a favourite subject, and one which he approaches frequently from different directions, and illustrated in a variety of ways.

JOVELLANOS, GASPARD MELCHIOR DE, one of the most distinguished Spaniards of modern times, whether as a patriot, statesman, or writer, was born in 1744 at Gijon, in Asturia. Though sprung from an ancient and noble family, he early resolved to win fame and wealth for himself. Selecting the law as his profession, he went through the usual courses of study at the universities of Oviedo, Avila, and Alcalá. A judicial appointment at Seville awaited him immediately on his leaving college; but so disinterested was his zeal for the public service that, though but a poor man, he could with difficulty be persuaded to accept the emoluments of his office. In 1778 his integrity and ability were rewarded with the chief judgeship of the King's Court at Madrid, where he gained the friendship of Campomanes, and the leading literati of Spain, and took a prominent part in most of the scientific societies. About this time he had made the acquaintance of the brilliant French adventurer Caburrus; and when that friend afterwards fell a victim to court-intrigue, Jovellanos was for a time involved in his fall. Retiring to the place of his birth, he devoted himself to carrying out many useful schemes for developing the internal resources of the country. He founded the Asturian Institution for the purpose of improving the agriculture, working the mines, and effecting social and educational reform throughout that province. This institution continued his darling project up to the latest hours of his life. Summoned again in 1799 to take his part once more in public affairs, he repaired to the capital, where he was made home secretary-of-state under Manuel de Godoy, the famous Prince of Peace. The looseness of Godoy's private life, and the miserable character of his policy, disgusted Jovellanos, who used his influence to have his principal dismissed. Intrigue followed intrigue; plot was met by counter-plot; and the final result was that the home secretary was banished to the island of Majorca, and there kept a close prisoner, first in a Carthusian convent, and afterwards in the castle of Belver. He beguiled the seven years of his exile in collecting materials for a history of the island; and, in the intervals of these studies, wrote many bold and vigorous addresses to the king on the wretched policy of his prime

Jovianus. minister. The French invasion changed the aspect of affairs. Jovellanos was recalled; and when Joseph Bonaparte mounted the throne, he was offered the portfolio of the interior. Many liberal and well-informed men had recognised the French king; but Jovellanos, sternly keeping aloof, joined the patriotic party, became a member of the central junta, and contributed to re-organize the cortes. As soon as the parliament had been reconstituted, the supreme junta fell into suspicion and was dissolved. Jovellanos, who had been the guiding spirit of its councils, was involved in its fall. To expose the conduct of the cortes, and to defend the junta and himself, were the last labours on which he exercised his pen. So great were his popularity and influence that it became necessary for his enemies to get rid of him. On the 27th Nov. 1811, the dagger of the assassin deprived Spain of one of her best benefactors and most enlightened patriots.

Jovellanos' literary faculties were of a very high order, and were proved by numerous compositions both in prose and verse. His poetical attempts comprised the tragedy of *El Pelayo* (the valiant Goth who fought against the Moors for the freedom of Spain), a collection of miscellaneous pieces, and a translation of the first book of Milton's *Paradise Lost*. None of these, however, reflect any great credit on his name; and had his fame depended on any or all of them, he would have been long ago forgotten. It is especially as a political economist and legislator that Jovellanos will be remembered. A deep, sure thinker, he was, at the same time, a brilliant rhetorician; and, indeed, as a mere writer of Spanish prose, has no equal in modern times. His *Elogios* on the celebrated architect Ventura Rodriguez, and on the king, Charles III., with the vices inherent in that species of composition, combine a memorable depth of thought couched in language of extraordinary beauty. But the greatest of all his works is his *Informe Sobre un Proyecto de Ley Agraria*, a remarkable monument of political foresight and legislative sagacity. No one ever knew or explained better than Jovellanos did in this and some of his other works the causes of his country's downfall, or point out with greater clearness the true means of restoring it to its ancient greatness.

JOVIANUS, FLAVIUS CLAUDIUS, emperor of Rome, A.D. 363-4, was a scion of a noble Mœsian family, and the son of the Comes Veronianus, a distinguished general and high officer of state under Constantius. Jovian, who was captain of the life guards of the Emperor Julian, accompanied his master on his disastrous campaigns against the Persians. When Julian fell in battle, A.D. 363, Jovian was proclaimed by the army his successor. His first task, on assuming the purple, was to conduct his army back to his dominions. He reached the Tigris in safety; but Sapor with his hosts hung upon his rear, and he found it impossible to cross that great river in presence of the Persian army. Sapor, afraid to drive the Romans to despair, proposed terms of peace, which, ignominious as they were, Jovian was fain to accept. The terms were, that the Romans should surrender their conquests beyond the Tigris, along with the fortress of Nisibis, and many other strongholds in Mesopotamia; and should, moreover, bind themselves to give no aid to the Armenians, with whom Persia was then at war. Saving his army and himself, if not his honour, on these conditions, Jovian hastened westwards to arrange the internal affairs of his kingdom. One of his first acts was to proclaim himself a Christian, and to rescind the edicts of his predecessor against the Christians. He granted protection, however, to such of his subjects as adhered to the old system; and when urged by some importunate sectaries to help them against other sectaries, he sternly reminded them that impartiality was the first duty of an emperor. Himself strictly orthodox, he upheld the Nicene creed against the Arians, and reinstated the ecclesiastics who had suffered

at their hands. One of his first acts, indeed, on arriving at Antioch, was to restore his friend Athanasius to his see of Alexandria, from which the machinations of the Arians had driven him. After waiting a few months at Antioch to receive homage from the various provinces of the empire, he set out for Constantinople, and, taking Tarsus on his way, paid the last honours to the ashes of Julian. Continuing his journey in the face of an unusually severe winter, he arrived at Aucyra, where he assumed the consular honours, and a few days later at Dadastana, a frontier town of Galatia and Bithynia. On the following morning (Feb. 17, 364), he was found dead in his bed. His death was attributed to various causes. Some say that he was suffocated by the fumes of a charcoal fire in his chamber; others, by exhalations from the plaster with which it had been newly laid. It is most likely that he died under the dagger or poison of an assassin. He was in the thirty-third year of his age, and had only reigned for seven months. Valentinian was proclaimed his successor by the army.

JOVIUS, PAULUS, a celebrated historical and biographical writer of Italy, was a scion of a noble family of Como, and was born in that town in 1483. His own name was Paolo Giovio, but as his most important works are written in Latin, he is better known under the Latinized form of that name. Choosing medicine as his profession, he studied at the universities of Padua and Pavia; but, in the course of his studies, being seized with the idea of becoming the historian of his age, he abandoned his first choice and devoted himself to the career of letters. His first care was to master the Latin classics chiefly with the view of forming a good Latin style for himself. His success was decisive, and gained him the favour of Leo X., who, on reading some of Giovio's compositions, declared that "after Titus Livius there was no writer more elegant or more eloquent." Honours and rewards soon poured in upon the lucky historian, who was sent upon various important missions to different countries in the train of Giulio de Medici. When this patron afterwards became pope, under the name of Clement VII., he rewarded Giovio's services with the bishopric of Nocera. The historian, however, was too fond of the literary society and other attractions of the capital to exchange them for a see in the country, and accordingly entrusted the duties of his diocese to a deputy. In 1530, when the Emperor Charles V. met the pope in the famous conference of Bologna, Giovio was present, and heard from that monarch's own lips the details of his recent expedition against the Algerian pirates, intending to incorporate them in the historical work on which he was then engaged. After the death of his patron, Giovio was regarded with very little favour by the new pope, Paul III. He lived freely, talked freely, and wrote freely, and was therefore a fair match for the satirists of that day to shoot their arrows at. In religious matters he was described as a latitudinarian, and even as an infidel or an atheist; and it is certain that his morals were very far from being such as those of a bishop ought to be. On the accession of the austere Paul III., Giovio found it convenient to withdraw from the papal court altogether. He retired to his native town where he built himself a delightful villa, and gratified his luxurious tastes with the ample means he had amassed at Rome. The formation of a picture gallery and a museum was the business and the amusement of his later years. But he was too much of a courtier both by habit and disposition to endure the unbroken quiet of a country life. His humorous conversation and genial bonhomie made him a welcome guest at most of the Italian courts, and there he continued to spend a considerable part of each year. In the course of one of these periodical visits at Florence, he was seized with a violent attack of gout which carried him off in December 1552. He was buried in the church of St Lorenzo, where a monument records his virtues, his piety, and his learning.

Jovius.

Juan
Fernandez.

Giovio's works are of very different degrees of excellence and value. His *Historia sui Temporis*, 2 vols., 1550, though it contains much interesting information, is nearly valueless from not being trustworthy. Quite reckless as to the accuracy of any statement, he was too lazy and careless to verify it; and as he picked up a great deal from the gossip of the papal court and the strangers who visited it from all parts of the world, he could not but incorporate much in his history that was false with what was true. The *Historia* is, besides, characterized by so strong a spirit of partiality towards its author's friends and patrons, that it is practically useless as a historical guide. Charles V. detected this weakness of the historian, whom he discarded as a flatterer, and condemned as "writing with the golden pen of history." Giovio had warmly praised Charles' liberality; but when he found that all his arts could not wile a single ducat out of the stingy monarch, he denounced him (though not till after his death), as a man of the most niggardly parsimony. Greatly superior in literary finish as well as moral tone are his *Illustrium Vivorum Vita*, a series of biographical sketches of his most eminent contemporaries. This work, with some small deductions for defects, like those of the *History*, throws a useful side light on the annals of these stirring times. His only other work in Latin was that which first made him; it was entitled *De Piscibus Romanis*, and was dedicated to the Cardinal Louis de Bourbon. Of his vernacular compositions his *Lettere Volgare*, published after his death, are alone worthy of notice. Many of them are in a style of jovial humour that makes them well worth reading even in the present day.

JUAN FERNANDEZ, an island in the South Pacific, about 400 miles W. of the coast of Chile, in S. Lat. 33. 40., and W. Long. 79. It is about 15 miles long by 6 broad, and contains an area of nearly 65 square miles. The coast line is much indented, and the shores generally abrupt. On the north side the mountain called *El Yunque*, from its resemblance to an anvil, attains an elevation of 3000 feet above the sea level. The surface of Fernandez is irregular, with a general declination from N. to S. Its climate is agreeable, the island being neither visited with tempestuous winds nor exposed to the extremes of heat or cold. Little rain falls, but copious dew prevents any injury to vegetation from drought. The valleys on the N. are well sheltered, and a fine black vegetable mould forms the soil. The rocks of the island are either basaltic, trap, or volcanic, and are much disturbed by earthquakes. The soil produces oats, turnips, radishes, apples, strawberries, melons, peaches, figs, sandal-wood, and cork; while off the coast fish of every kind abound, and seals are plentiful. The only quadrupeds, however, that live on the island have been exported thither by accident or otherwise.

Juan Fernandez is only of importance as a calling place for vessels, forming a convenient stage for those sailing between Chile and Australia as well as for those coming round Cape Horn, for Lima or California. Very good water may be had on the island, and also fruits in considerable variety. There are in all three harbours, namely, Port English on the S.E. side, Port Juan on the W., and Cumberland Bay on the N.E. Of these the last is the safest and the only convenient one, having, it is said, 10 fathoms of water at two cables length from the shore, and plenty of fresh water at the head of the bay.

The history of Juan Fernandez is necessarily associated with the events which happened during the exploratory navigations of the Pacific. The island long formed a resting place for the early Spanish and English navigators in these waters. The time of its discovery and the name of the first European who sighted its shores are subjects of doubt. It is certain, however, that one Juan Fernandez visited and gave his name to the island. The advantages which this island afforded for repairing and victualling, ren-

dered it a principal resort of the buccaneers in that part; and, in order to deprive them of supplies, the Spaniards landed a number of Chilean greyhounds on the island for the purpose of exterminating the goats, which were thus driven to the steep and inaccessible elevations. About the year 1750 the Spanish government established a colony here, consisting of civilians, and a small garrison; but the settlement had hardly been established when it was destroyed by an earthquake, the sea having risen and overwhelmed the houses and carried off 35 persons, among whom were the governor, his wife, and children. This convulsion was also severely felt in Chile and Peru.

During the War of Independence in Chile which lasted from the year 1811 to 1818, Fernandez was used by the royalists and republicans respectively, according to the party in power, as a penal settlement for political offenders, and continued in the hands of the Chilean republic after the termination of that strife. The small penitentiary that remained in the island was, however, all but totally destroyed by the earthquake of 1835, and the Chilean government, after making another vain endeavour to colonise it, gave up the attempt and ultimately withdrew the garrison. It then remained unoccupied for a considerable time, until an adventurer from the United States rented the island from Chile and colonized it. This also was unsuccessful, and the settlement broke up. Of late years the occupants have been few in number, amounting to from ten to twenty, who live in rudely constructed huts not far from the sea shore, depending on the natural produce of the soil and on the seal fishing; they also earn small sums of money by supplying the ships with fresh provisions. The advantages possessed by Juan Fernandez as a calling station for vessels have been considerably overrated. Its proximity to the port of Valparaiso is a sufficient reason for shipping bound for Chile not breaking their voyage at the island, except in cases of emergency; while vessels outward bound would have still less occasion to anchor in Cumberland Bay, only 400 miles from the point of departure.

It is well known that here Alexander Selkirk, a Scotsman, lived alone for more than five years; and it is generally believed that the narrative of his sojourn formed the foundation on which Daniel Defoe reared his celebrated work of *Robinson Crusoe*.

About 70 miles W. of Juan Fernandez is the island called Fernandez de Afuera (to seaward), with precipitous shores, on which there is always a high surf.

JUBA I., the son of Hiempsal, king of Numidia, succeeded to the throne on the death of his father, about B.C. 50. In the civil wars of Rome he espoused the cause of Pompey, induced both by a spirit of political conservatism, and by hatred to Cæsar, with whom he had quarrelled violently when young. He gained a signal victory at Utica over Curio, Cæsar's lieutenant in Africa, and barbarously put to death all the prisoners that fell into his hands. When the Pompeian party was overthrown at Pharsalia, Juba still continued faithful to the cause, raised large masses of troops to check the conqueror's passage through Africa, and at one time reduced him to great straits. Joining his forces to those of Scipio and Cato, he encountered Cæsar at Thapsus. The allied army was utterly routed, and Juba fled for refuge to his own dominions. A rebellion had broken out among his subjects in his absence, and Juba, in despair, put an end to his life. His kingdom was reduced into the form of a province, of which the historian Sallust was the first governor. Juba plays a conspicuous part in Addison's tragedy of *Cato*, with whose destiny his own had latterly been linked.

JUBA II., the son of Juba I., was, after his father's death, carried captive by Cæsar to Rome. He was there carefully educated, and, according to Plutarch, "soon equalled, in learning and knowledge, the wisest philoso-

Juba I.
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Juba II.

Jubilee.

phers of Greece and Rome." Identifying himself with the cause of Augustus, he fought on his side, and was rewarded for his valour with the kingdom of Mauritania. He cultivated the arts of peace, and made himself so much beloved by his subjects that they ranked him among their gods, and raised numerous statues in his honour. He married Selene, or Cleopatra, the daughter of Antony and the Egyptian Cleopatra. Coins and medals commemorating their reign are still extant. Juba's learning was attested by historical writings, which were held in high repute, and were frequently quoted by such men as Pliny and Plutarch as ultimate authorities on many points. They were written in Greek, and, so far as is known, comprised the *History of Africa*, in which he made use of the Punic authorities accessible to him, and thus greatly enhanced their value; *The Antiquities of Assyria and Rome*; *The History of Arabia, with Notes on its Natural History*; *The History of Painting and Painters*; a *History of Theatres*, of which some fragments have been preserved; an *Essay on the Source of the Nile*. The body of these works has been completely lost, but enough of them has been preserved in quotation to show that their loss was really to be regretted. A detailed account of the life and writings of Juba by the Abbé Sévin, is preserved in the *Mémoires de l'Académie des Inscriptions*, vol. iv., p. 457.

JUBILEE, a festival celebrated among the Jews every fifty years, and which led to important changes in their social condition. The word is supposed to be derived from *jobel*, a ram's horn, which was used as the trumpet for proclaiming the arrival of the year of jubilee; or, according to others, it was derived from *jabal*, to *recall* or *return*, because slaves were restored to liberty, and exiles recalled during this year. The periodical recurrence of the jubilee is closely connected with the Sabbatical institutions of Moses. As the seventh year, as well as the seventh day, was to be observed as a period of rest, it follows that every forty-ninth year would be one devoted to rest, and during it no crops were to be sown; but, according to the enactment in Exod. xxv., the year of jubilee was to be one of rest also, so that during two successive years there would be no crops sown. This has appeared such a difficulty to many, that they have endeavoured to prove the year of jubilee to be the forty-ninth instead of the fiftieth; but, in opposition to this, there are insuperable objections, for, in Exod. xxv. 8-17, the fiftieth year is repeatedly referred to as that on which the jubilee was to be celebrated. As to the difficulty, that a famine would follow if, for two successive years, all agricultural operations were neglected, it is to be remembered that the Jews were under a theocracy, and, so long as the Divine command was faithfully obeyed, there was no danger of famine. The injunction which required all the males periodically to visit Jerusalem necessarily left the country exposed to foreign invasion, but so long as they obeyed the Divine injunction, no man was to desire their land.

The object of the jubilee was to prevent the rise of any great disparity between the social condition of individuals. If the institution did not encourage splendid affluence on the one side, it helped to prevent sordid pauperism on the other. It tended to restrain cupidity, and preclude domestic tyranny, as well as to remind the rich and poor of their essential equality. It also served to preserve the distinction of families and tribes down to the coming of Messiah. For it is admitted that the original institution was in actual operation after the Babylonish captivity, as indeed can be proved from Ezek. xlvi. 17; Maccabees vi. 49; Josephus *Antiq.* xiv. 10, 6; and Tacitus, *Hist.* v. 4. The *acceptable year of the Lord*, spoken of by Isaiah before the captivity, must, without doubt, refer to the year of jubilee. Like the Greek *Olympiads* and the Roman *Lustra*, the jubilee was also most useful in a chronological point of view.

In modern times the word jubilee has been used to denote the ceremony at Rome, during which the pope grants plenary indulgence to those who visit the churches of St Peter and St Paul. This jubilee first took place under Boniface VII. in 1300, and was to return every 100 years; but as it was the means of bringing vast wealth to Rome, Clement VI. shortened the time to fifty years. This period was in its turn reduced to thirty-five years, and in 1475, by Sixtus IV., to twenty-five years. The privilege of holding jubilees was also bestowed upon princes and convents, and in process of time the celebration of a jubilee was determined as occasion required.

JUDAS MACCABEUS. See **JEW**s, and **JERUSALEM**.

JUDE, or **JUDAS**. There were two of this name among the twelve apostles—Judas, called also Lebbaeus and Thaddæus (Matt. x. 4; Mark iii. 18), and also Judas Iscariot. Judas is the name of one of our Lord's brethren, but it is not agreed whether our Lord's brother is the same with the apostle of this name. Luke calls him *Ἰούδας ἱακώβου*, which in the English version is translated "Judas, the brother of James." The ellipsis, however, between *Ἰούδας* and *ἱακώβου* is supplied by the old Syriac translator with the word *son*, and not *brother*. Among our Lord's brethren are named James, Joses, and Judas. If, with Helvidius among the ancients, and Kuinoel, Neander, and a few other modern commentators, we were to consider our Lord's brethren to be children of Joseph and the Blessed Virgin, we should be under the necessity of supposing that there was a James, a Joses, and a Judas, who were uterine brothers of our Lord, together with the apostles James and Judas, who were children of Mary, the sister or cousin of the Virgin. If, however, the hypothesis of their being children of the Blessed Virgin be rejected, there remains for us only a choice between the two opinions, that our Lord's brethren were children of Joseph by a former wife (Escha, or Salome, according to an apocryphal tradition), which was the sentiment of the majority of the fathers (still received in the Oriental Church), and that adopted in the Western Church, and first broached by St Jerome, that the brethren of our Lord were his cousins, as being children of Mary, the wife of Cleophas, who must therefore be considered as the same with Alphæus. If we consider James, the brother of our Lord, to be a different person from James the son of Alphæus, and not one of the twelve, Jude, the brother of James, must consequently be placed in the same category; but if they are one and the same, Jude must be considered as the person who is numbered with our Lord's apostles. We are not informed as to the time of the vocation of the Apostle Jude to that dignity. Only one circumstance relating to him is recorded in the Gospels. Nor have we any account given of his proceedings after our Lord's resurrection, for the traditional notices which have been preserved of him rest on no very certain foundation. It has been asserted that he was sent to Edessa, to Abgarus, king of Osroene (Jerome *Annot. in Matt.*), and that he preached in Syria, Arabia, Mesopotamia, and Persia; in which latter country he suffered martyrdom (Lardner's *Hist. of the Apostles*). Jude the Apostle is commemorated in the Western church, together with the Apostle Simon (the name, also, of one of our Lord's brethren) on the 8th of October. There is an interesting account preserved by Hegesippus (Eusebius, *Hist. Eccles.* iii. 20) concerning some of Jude's posterity:—"When Domitian," he observes, "inquired after David's posterity, some grandsons of Jude, called the Lord's brother, were brought into his presence. Being asked concerning their possessions and mode of life, they assured him that they had thirty-nine acres of land, the value of which was 9000 denarii, out of which they paid him taxes, and maintained themselves by the labour of their hands. The truth of this was confirmed by the hardness of their hands. Being asked concerning

Judas Mac-
cabeus
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Jude, or
Judas.

Jude,
Epistle of,
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Juggernath.

Christ and the nature of his kingdom, they replied that it was not a kingdom of this world, but of a heavenly and angelic nature; that it would be manifested at the end of the world, when he would come in glory to judge the living and the dead, and render to every man according to his works. Having observed their humble condition and their harmless principles, he dismissed them with contempt, after which they ruled the churches, both as witnesses and relatives of the Lord."

JUDE, *Epistle of*, is placed by Eusebius among the *controverted books*, having been rejected by many of the ancients. It is, however, cited by Clemens Alexandrinus (*Strom.* iii. 431), by Origen (*Com. in Matt.*, &c., &c.), and by Tertullian (*De Habit. Fam.*). It is also included among the books of the New Testament in the ancient catalogue discovered by Muratori, a work of the second century. It is found in the catalogues of the Councils of Laodicea, Hippo, and Carthage, and in the apostolical canons, but is wanting in the Peshito or ancient Syriac version. It is, however, cited as of authority by Ephrem. In modern times its apostolic source at least, if not its canonicity, was called in question by Luther, Grotius, Bolten, Dahl, Berger, and Michaelis, but it is acknowledged by most to be genuine. Indeed, the doubts thrown upon its genuineness arose solely from the writer having cited two apocryphal books. In regard to the authorship moderns are divided in opinion between Jude the apostle and Jude the Lord's brother, if indeed they be different persons; Hug and De Wette ascribe it to the latter. The author simply calls himself Jude, the brother of James, and a servant of Jesus Christ. This form of expression has given rise to various conjectures. Dr Lardner supposes that Jude's Epistle was written between the years 64 and 66, Beausobre and L'Enfant between 70 and 75 (from which Dodwell and Cave do not materially differ), and Dr Mill fixes it to the year 90. If Jude has quoted the apocryphal book of Enoch, as seems to be agreed upon by most modern critics, and if this book was written, as Lücke thinks, after the destruction of Jerusalem, the age of our Epistle best accords with the date assigned to it by Mill.

JUDEA. See PALESTINE.

JUDENBURG (the ancient *Idunum*), a town in the Austrian province of Styria, capital of a cognominal circle, on the Mur, 38 miles W. of Grätz. In the middle ages it carried on an important trade with Germany and Italy, but at present it has scarcely any trade, and its chief manufactures are gunpowder and ironware. On 7th April 1797, an armistice was signed here between the French and Austrians. Pop. about 2000.

JUGDULUK, a village of Afghanistan, in the defiles between Jelalabad and Cabool, 5375 feet above the level of the sea, in N. Lat. 34. 25., E. Long. 69. 46. It was one of the principal scenes of the massacre of the British troops retreating from Cabool in the beginning of 1842.

JUGGERNATH, properly JAGATNATHA (*the Lord of the World*), a celebrated temple and place of Hindu worship, on the sea-coast of Orissa, and district of Cuttack, esteemed the most sacred of all the Hindu religious establishments. It is situated a few miles to the N.E. of the Chilka Lake, close to the sea shore, and when seen from a distance is a shapeless mass of building, but forms an excellent landmark for navigators in approaching so low a coast. The temple of Juggernath stands within a square area inclosed by a lofty stone wall measuring 650 feet on a side. The inclosure is entered on the E. by a grand gateway, from which a broad flight of steps gives access to a terrace 20 feet in height, inclosed by a second wall 445 feet square. From this platform the great pagoda rises to the height of about 180 feet from the platform. At the gate of the outward wall are two large statues of singhs, an imaginary or fabulous animal, nearly as large as an elephant. Juggernath is said to be one of the incarnations of Vishnu;

but the original dedication of the temple is involved in fable. Jugurtha. It is known to have existed for above 800 years, and is mentioned as a celebrated place of Hindu worship by the oldest Mohammedan historians of India. The idol itself is a huge disgusting image of the human form, made of wood, with a frightful black visage, and a distended mouth foaming with blood. On each side of him is another image, one part of which is painted white, and the other yellow; the first is said to be the image of his sister Shubudra, the other that of his brother Balaram. The throne of the idol is placed on a stupendous car or moveable tower about 60 feet high, resting on wheels, which, from the weight, indent the ground deeply as they move along. Formerly devotees threw themselves under the wheels, and were crushed to death, but these horrible deeds are now prohibited by the British government. The tower is drawn along by the people by means of ropes, amidst the shouts of the ignorant multitude; and upon the car are the priests and attendants. The concourse of Hindu pilgrims to this shrine is immense; the aged come to die at Juggernath; and so numerous are these pilgrims, that the approach to it is known at the distance of 50 miles by the quantity of human bones strewed on the way. The impurity of the Hindu idolatry is strongly indicated by the indecent sculptures that cover the walls of the temple and the sides of the machine.

The resort of Hindu pilgrims to Juggernath is the source of a considerable revenue; and the British, by the conquest of the province of Cuttack from the Mahrattas in 1803, had succeeded to all their rights as sovereigns, and consequently to the right of collecting this tax on the superstition of the inhabitants. The pilgrim tax thus became a regular source of revenue to the East India Company. At home the measure was disapproved by the Court of Directors, but the president of the Board of Control, Mr Dundas, took a different view; and, through his influence, a despatch was framed, to the effect that, as the tax on pilgrims had been levied under Mohammedan and Mahratta governments, there did not appear any objection to its continuance under the British government. In 1839, under the administration of Lord Auckland, the subject came again under notice, when arrangements were made for the abolition of the pilgrim tax, and shortly after the British government wholly disconnected itself from idolatrous worship. It is a circumstance for congratulation that the government has thus purged itself from a foul scandal, which lowered its character and impaired its usefulness. The superintendence of the temple is now exercised by the rajah of Khoordah, who is forbidden to receive any payments from pilgrims except such as may be voluntarily offered. One of the chief periods of pilgrimage is in March, when the Dole Jattrah takes place; and the other in July, when the Ruth Jattrah is celebrated. Distant S.W. from Calcutta 250 miles. E. Long. 86. 5., N. Lat. 19. 49. (E. T.)

JUGURTHA, the Numidian usurper, occupies a prominent place in the history of Rome, not only from the greatness of his own exploits, but as having furnished the subject of one of the most masterly pieces of historical writing that antiquity has handed down to modern times. He was born shortly before the middle of the second century B.C. He was the illegitimate child of Mastanabal, the youngest son of Masinissa, king of Numidia. He was brought up by his uncle, Micipsa, and at an early age gave signs of that warlike, intriguing, and ambitious spirit which enabled him for some years to defy the generals and armies of Rome itself. In the hope that he might fall in battle, Micipsa gave him the command of the troops which he was sending into Spain to help the Romans in the Numantine war. Jugurtha distinguished himself greatly, and returning home in safety at the end of the war, was adopted by Micipsa, and named joint-heir with his own sons, Adherbal and Hiempsal. Micipsa died soon after, and Jugurtha,

Julian
Calendar
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Julianus.

aspiring to the undivided sovereignty, caused Hiempsal to be murdered, and Adherbal only escaped the same fate by a timely flight to Rome, where he laid his case before the senate. A commission was appointed to decide upon the claims of the rivals. By means of unscrupulous bribery Jugurtha secured the largest and best portion of his uncle's kingdom. Scarcely had peace been restored, when Jugurtha invaded his cousin's territory, defeated him in the open field, shut him up in Cirta, his capital, and having taken that city by storm, cruelly put him to death. This outrage excited great indignation at Rome, and war was immediately declared against the usurper. Partly by a desperate resistance, partly by skilful bribery, Jugurtha foiled the generals opposed to him, and was by them confirmed in possession of the whole realm of Numidia. The senate refused to sanction this arrangement, and Jugurtha repaired to Rome under the public guarantee to plead his cause in person before the senate. Unstinted bribery was as effective now as ever, and he practically gained his case by prevailing on the senate to suspend judgment altogether. This success encouraged him to fresh outrages. Hearing that his cousin Massira was plotting to supplant him on the Numidian throne, he caused him to be assassinated. The murder was traced to him; but as he had come to Italy under the public guarantee, it was impossible to punish him in Rome. He was immediately ordered out of Italy. On quitting the city, he is said to have looked back upon it, and to have apostrophized it as "venalis, et mature peritura si emptorem inveniet." War was now formally declared, B.C. 111, and the campaign opened disastrously for the Romans. Aulus Posthumius was surprised, surrounded, and, with his whole army, sent under the yoke. Metellus, the new consul, next took the field with fresh troops, and prosecuted the war with great vigour. Bribes were offered to him in vain by his wily adversary, who was speedily reduced to desperate straits. Caius Marius next took the command; but Jugurtha, aided by the Mauritanian Bocchus, still continued to make head against this terrible foe. Town after town fell into the hands of Marius, and a bloody pitched battle at last laid Africa at his feet. Bocchus temporized, and, as the price of his own safety, delivered up his ally to the Romans. Jugurtha was carried to Rome, where, after decking the triumph of Marius, he was thrown into the Mamertine prison, and cruelly put to death, B.C. 106. (Sallust's *Jugurtha*; Plutarch's *Life of Marius*; Diodorus Siculus, *Fragm.*, vol. x., p. 141.)

JULIAN CALENDAR. See CALENDAR.

JULIANUS, FLAVIUS CLAUDIUS, emperor of Rome from December 361 to June 363, was the son of Julius Constantius, and nephew of Constantine the Great, and was born in A.D. 331. On the death of Constantine, the soldiers, to assure the empire to his sons, murdered his collateral relations. Julian and his half-brother Gallus alone escaped. Constantius the new emperor hearing that his cousin was still in life, consigned him to the care of Eusebius, bishop of Nicomedia. By this prelate and the learned eunuch Mardonius, Julian was trained not only in every branch of polite literature, but in the doctrines of the Christian system. At a befitting age he was made a reader in the church, and in that capacity used to expound the Scriptures to the people. At the age of fourteen he was transferred to the castle of Macellum, where he and Gallus were educated together under the strictest surveillance. When Constantius, who was childless, found it necessary to adopt Gallus as his heir, Julian returned to the capital to carry on his studies, and there made the friendship of the sophist Libanius. Reasons of state induced his cousin to send him back once more to Nicomedia, where he fell under the sway of Maximus of Ephesus, and other Platonists. After the tragic death of Gallus in 355, Julian was sent to Milan, where he remained for some months as

Julianus.
closely watched and guarded as ever. More than once his life, endangered by the suspicions and caprice of his imperial cousin, was saved at the instance of the empress Eusebia. By her advice he was now invited to court, and named heir to the purple. The emperor next gave him his sister Helena in marriage, and assigned to him the government of Gaul, which the hordes of German invaders were then laying waste with fire and sword. In four successful campaigns Julian displayed his bravery and military skill. The Germans were driven across the Rhine, and Chnodomar, their most powerful king, taken prisoner. Fixing his headquarters at Lutetia (Paris), he set himself to repair the havoc of the barbarian invasions. Cities were rebuilt, impost and taxes abolished, and rapacious governors punished. All these reforms were brought about in such a way as to gain to their author the highest credit for gentleness and clemency, as well as wisdom and sagacity. When the war with Sapor, king of Persia, broke out, Constantius, alarmed at his cousin's growing popularity, took the occasion to draft away to the East the veteran legions of Gaul. When they were preparing to depart, Julian assembled them at Paris, and formally bade them farewell. His address was received with shouts of displeasure, and before he could understand what was meant he found himself saluted as emperor. His first step was to announce the fact to his cousin, whose timely death saved the Romans from the scourge of a civil war. Julian hastened to the capital, and was quietly invested with the imperial purple. His first act was to put an end to the reckless and wasteful extravagance which had prevailed at the court of his predecessor. He himself affected the extreme of simplicity, always walked on foot, prided himself on the length of his nails, and the inky blackness of his hands; and, in his *Misopogon*, "celebrates with visible complacency the shaggy and *populous* beard, which he fondly cherished after the example of the philosophers of Greece" (Gibbon, ch. xxii.). To carry out his reforms he established, at Chalcedon, on the Asiatic side of the Bosphorus, an extraordinary chamber of justice, consisting of six judges of the highest rank in the state and army. The object of this tribunal was to bring to trial such public men as in the last reign had abused their influence with the emperor to grind down and oppress the people. Many guilty persons were condemned and punished, but unfortunately some who were quite innocent shared the same fate. In the latter class was Ursulus, the able and honest treasurer of the empire, "over whose fate," in the words of the historian Ammianus, "justice herself appeared to weep." Among the wise edicts which Julian had published on ascending the throne, was one proclaiming universal toleration. His own conduct, however, was soon marked by a keen and even bitter hatred to Christianity. Though brought up in that faith, he had never owned himself its disciple; and the name of the Pagan would have suited him better than that of the Apostate, which was fixed upon him when he abolished Christianity as the religion of the empire. Revoking the edict of universal toleration, he persecuted the Christians, confiscated the revenues of their churches, and taxed them heavily to rebuild the heathen temples, which, in their day of power, they had pulled down and plundered. He excluded them from every, even the meanest, office of state; and by a special edict forbade them either to study or to teach polite literature. With his connivance, if not at his instigation, the whole paganism of the empire rose in arms against the disciples of the new faith, and imprisoned, tortured, and even offered them as victims on the altars of the heathen gods. Such of the unfortunates as claimed Julian's protection were answered with the heartless taunt that "Every Christian is called upon to suffer." Among the victims was the aged Marcus, bishop of Arctunsa, who had saved Julian, when a boy, from the general butchery of his father's

Julianus. family. When the emperor heard that his old preserver had been ignominiously dragged through the mud and tortured to death, he allowed the perpetrators of the foul deed to pass unpunished. The feeble efforts which he made to check these and similar excesses only served to stimulate the fanaticism of the persecutors. Meanwhile, Julian had resolved to make war upon Sapor, king of Persia. On his way to the East he made Antioch his head-quarters till the expedition should be completely organized. During his sixth months' residence in that city, his unkingly dress and manners, ill-trimmed beard, and strange retinue, offered a tempting mark to the shafts of ridicule, and gave abundant occupation to the epigrammatists and small wits of the place. Julian avenged himself in his famous satire of *Misopogon*, or Beard-hater, the most trenchant and original of his works. He afterwards took a far more terrible vengeance, by appointing to the government of the city one of the worst men in his dominions. When the inhabitants remonstrated, he replied, "I well know that Alexander is a bad man, and does not deserve a government; but he is exactly such a governor as the greedy and insolent Antiochians deserve." When everything was at last ready, Julian set out on his expedition with a brilliant and well-appointed army of 65,000 men. The campaign brought out the better qualities of his nature. He was indefatigably active, and exposed himself to every hardship like the meanest soldier. Success at first attended his arms. He crossed the Euphrates, and afterwards the Tigris, without loss, took several strongly fortified towns, and defeated the Persians in many skirmishes. His nimble foe, however, refused to close with him in a pitched battle, but his clouds of light horsemen cut off the foraging parties, and the Romans were soon reduced to great straits for supplies. Still, they held out so gallantly, that Sapor seriously thought of suing for peace, when, in a skirmish of outposts, the Roman emperor fell mortally wounded. Brought back to his tent, and feeling that he had but a short time to live, he spent his last hours in discoursing with his friends on the immortality of the soul. He reviewed his reign, and declared himself satisfied with his own conduct, and as having neither penitence nor remorse to express for anything that he had done. He died on the 27th July 363, after a reign of one year and nearly seven months. In accordance with his own instructions, his ashes were carried to Tarsus, in Cilicia, where a stately monument was erected to his memory by his successor, Jovian.

The character of Julian is one of the most interesting and difficult of historical problems. He seemed to have embodied, if not reconciled in himself, qualities in their own nature most opposite. With brilliant endowments, he often acted as for the most part fools only act. Naturally, and to the last humane, he allowed his kingdom to be drenched with the blood of his Christian, in other words, his best subjects. Many of his acts and edicts were lofty in aim and wise in effect; others were illogical and arbitrary. His personal morals were austere pure, and many of his meanest subjects were both better clad and better fed than he; yet he lavished his wealth and hospitalities on the sophists whom he chose as his friends. With all his modesty and self-denial, he had no small share of vanity, which showed itself in his eager thirsting for posthumous fame. To be remembered, when other monarchs of his line should be forgotten, was to him a prize worth any amount of hardship and self-sacrifice. When in early life his chances of the throne were very small, he sought to immortalize himself as an author; and, to make his character as marked and unique as possible, he affected those eccentricities from which in later life he failed, if indeed he ever tried, to disengage himself. When he came to assume the purple, his imagination glowed with the hope of doing some great deed that should transmit his name to prosperity. His visions of

military glory were soon dispelled, when he found, at first, no foe against whom to concentrate the whole power of his empire. In the internal administration of his kingdom he found "ample room and verge enough" for reform, which he was not long of effecting. Such services as these, however, posterity was likely to regard as mere acts of duty, for which no special credit was due to him. A much better chance lay in his restoring the ancient greatness of the republic and the empire, and with it the religious system under which its triumphs had been achieved. Paganism, though on the wane, was still able to oppose a strong front to the new faith. Personally, Julian had little reason to prefer the new to the old. From his own relations—all adherents of the former—he had suffered nothing but cruel maltreatment, and more than once had narrowly escaped with his life, while the Christian church itself presented a sad spectacle of schism, disunion, angry controversy, and intolerance. On the other hand the friends of his youth, as of his riper years, had all been pagans, and by them he had uniformly been caressed, flattered, and admired; while the unity and splendid ceremonies of the pagan worship were probably not without their influence. It is ridiculous to suppose that he did not see through the absurdities of the old mythology; but it was part of his tactics to profess reverence for the deities of Rome, and he himself used to sacrifice to the mother of the gods and compose orations in honour of Apollo, whose son he ordered himself to be called. The sophists, his chosen friends, were not slow to confirm what his vanity had already whispered; and it is not difficult to see why they should have done so. Encouraged by their advice and the hopes of immortal fame, of which he might count himself secure, if successful, Julian came forward as the champion of paganism. It would almost seem as if, in doing so, he had done violence to the dictates of his conscience and the early religious impressions, from which his chequered career could hardly have set him free. If, in coming to this conclusion, we disregard the fierce attacks of the Christian fathers, Gregory of Nazianzus, Cyril, and Jerome, who accused him of downright hypocrisy, it is much less easy to reject the testimony of his own friend Libanius, and the historian Ammianus, who unconsciously make a similar admission.

Even had he not reigned, Julian's name would, in all probability, have been saved from oblivion by his writings. Of these the best are his *Letters*, especially that to Themistius, in which, in a lofty style, and with great closeness and force of reasoning, he details the duties of a sovereign. His *Cæsars*, or *The Banquet*, is a satire in which the Roman emperors are described as one by one seating themselves round a table in heaven, and defending themselves from the attacks made on the vices, crimes, and follies of their earthly career by Silenus. Gibbon pronounces this work one of the most agreeable and instructive productions of ancient wit. His *Oration*s are less interesting. His narrative of his *Gaulic Campaigns*, as also his *Refutation of the Christian Religion*, has unfortunately perished. The best editions of Julian's complete works are those of Petavius, Paris, 1630; and of Ezechieel Spanheim, Leipzig, 1696. (*Life of Julian*, in Gibbon's *Decline and Fall*; *Vie de Julien*, by the Abbé de la Bletterie; *Vie de Julien*, by M. Thourlet; *Histoire de Julien*, by M. Jondot; Neander's *Ueber den Kaiser Julian*, &c., &c.)

JULICH, the capital of a cognominal circle in the Prussian province of Aix-la-Chapelle, is situated on the Roer, 15 miles N.E. of Aix-la-Chapelle, and 24 miles W. of Cologne. It is strongly fortified, and has a citadel of great strength. Chief manufactures, woollen cloth, leather, and soap. Jülich is the ancient *Juliacum*, and is said to have been founded by Julius Cæsar. Pop. 2890.

JULINDER DOOAB, a tract of country in Upper India, lying, as the word Dooab implies, between two rivers,

Julich.
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Julinder
Dooab.

Julius I. which, in this case, are the Beas and the Sutlej. It has an area of about 374 square miles. This territory came into British possession during the earlier operations against the Seikhs, and was permanently retained as a portion of the British dominions under the Treaty of Lahore, concluded in March 1846, whereby the Maharajah of the Punjab ceded to the East India Company, in perpetual sovereignty, all his territory between the Beas and the Sutlej. The tract is situated between the 31st and 33d degrees of N. Latitude.

Julius II.

JULIUS I. succeeded Marcus on the papal throne A.D. 337. It was during his pontificate that the church was embroiled by the Arian heresy. Athanasius, bishop of Alexandria, driven from his see by the Eusebians, had repaired to Rome to defend himself from the charges brought against him by them. Julius received him with honour; and, in a council held at Rome in 342, but which the Eusebians refused to attend, the deposed bishop was held to have completely cleared himself. The Eusebians complained, and another council was held at Sardica in Illyria. This council likewise they refused to attend; and Athanasius was again acquitted. The two parties then mutually communicated each other, the Eastern faction being peculiarly indignant at Julius, whom they accused of being the author of the whole evil. Another cause of their bitter feeling seems to have been that the council invested the bishop of Rome with the power of arbitrating on matters relating to the deposition of a bishop. After a pontificate of fifteen years, Julius died in 352. Two letters of his are extant, both bearing upon the affair of Athanasius. Some others have been spuriously ascribed to him.

JULIUS II., one of the greatest of all the successors of St Peter, came to the throne on the death of Pius III. in Nov. 1503. He was the nephew of Sixtus IV., but his own parents were obscure and poor persons in the little town of Abizal, near Savona. Entering the church and occupying successively the sees of Carpentras, Ostia, Albano, Bologna, and Avignon, he had reached all but the highest grade in the church as Cardinal della Rovere. From an early age he had taken an active part in all the political movements of that stirring age. Few of his contemporaries were so well able as he, either to read or to control the signs of the times; and he was likened to Virgil's Neptune lifting his serene head above the billows, and calming their fury with a glance. His keen sagacity pierced into the inner core of men. His mind was capable of forming vast designs, while his intellect, fertility of resource, and indomitable will enabled him to give them practical effect. These qualities, combined with a boundless ambition, a courage which nothing could daunt, and an insatiable passion for war, went to form a character apparently better adapted to lead great armies, or govern a great state, than to diffuse and maintain peace and good-will among men. The great idea of his life, as soon as he assumed the tiara, was to enlarge the territorial domains of the church. This aim he always kept steadily in view, and before his death he could boast that he had laid the foundations of such a power as never pope before him had possessed. His first step was to rid himself of Cæsar Borgia, whose crimes, passions, and power had long made his name a watchword of terror in Rome. Julius was dexterous enough to drive this scourge of the country out of his dukedom and possessions in the Romagna; but he found that his claims to the conquered lands were contested by the Venetians who had seized Ravenna, Rimini, and other important places. They were determined to keep them at all hazards, and Julius was far too weak to cope with them in war unaided. It was to no purpose that they offered to do him homage and pay him tribute for what they looked upon as their lawful conquests. The pope refused to content himself with anything short of their unconditional surrender of these cities and lands to the church, as repre-

sented in his own person. The Venetians were obstinate, and Julius organized against them, in 1508, the celebrated "League of Cambray," by which the Emperor Maximilian of Germany, Louis XII. of France, and the Duke of Ferrara, bound themselves to blot out the republic of Venice from the map of Europe, and parcel out its dependencies among them. But the pope, resolute as he was to assert his rights to the hereditary possessions of the church, had no desire to see either French or Germans (or, as he called them, "the barbarians") secure a permanent foothold in the Italian peninsula. No sooner, therefore, had he vindicated his ancestral rights, and been confirmed in his conquests of Parma, Piacenza, and Reggio, than he concluded peace with Venice, which, after a disastrous war of two years, was ready to listen to his overtures. To rid Italy of "the barbarians," he tried to sow the seeds of discord between the French and Germans. Foiled in this attempt, he called in the Swiss to his aid, and with their help took the field in person against the French in Lombardy. In 1511 he laid siege to the town of Mirandola, took it, and caused himself to be drawn over the frozen trenches, and through the breach into the ruins. The summer campaign was less prosperous, and was marked by the loss of Bologna to the pope. In the autumn, however, he formed what he was pleased to call a "holy" league with the Swiss and Venetians, and the kings of Spain and England. The allied troops took the field in the following year. Under their cruel but able general Gaston de Foix, the French made a most gallant resistance; but in the desperate fight of Ravenna they were utterly routed. Their commander was killed, and the relics of the army were speedily driven across the frontier into their own country. But though he had thus rid himself of the French, he had little reason to pride himself on his success. Italy was as full as ever of "barbarians"—the motley armies of Spain, Switzerland, and Germany,—who took upon themselves to remodel the internal constitution of such of the Italian states as were in their power. Julius did not live to see all the evils which his policy entailed on his country, as he died after a brief illness, Feb. 21, 1513. But he witnessed the overthrow of the Florentine republic, and the beginnings of other changes well calculated to fill with gloomy forebodings a mind so acutely alive as his to the political tendencies of the age.

Though Julius left no literary record of his genius, he was a warm and enlightened patron of literature and the fine arts. He treated with marked honour the leading scholars of that age, Bembo, Castiglione, Flaminio, and others, and enriched the library of the Vatican with many rare and precious books and MSS. He gave full scope to the genius of Bramante, and with his own hand laid the foundation of the new church of St Peter, which that architect had planned. Michael Angelo and Raphael owed their early fame to his patronage. Perugino reached in his pontificate the acme of his renown, and Leonardo da Vinci then first came forward to share with Michael Angelo the suffrages of the world. The reign of Julius in short was the golden dawn of that day which reached its splendid noon under Leo X.

JULIUS III., Cardinal del Monte, whose family name was Giocchi, succeeded Paul III. in 1550. One of his first acts was to recommence the sittings of the Council of Trent, which had been discontinued under his predecessor. A silly quarrel between him and Ottavio Farnese, involved France and the Empire in a bloody war. One of its consequences was another suspension of the Council of Trent; for which Julius was secretly very thankful, as the debates had threatened to be troublesome and complicated. The closing of the council seems to have been the last act of his public life. The remainder of his days were spent in an imbecile and immoral self-indulgence. He died in 1555, in the sixty-fourth year of his age, and sixth of his pontificate.

Julius III.

Jumbasier
||
Junagur.

JUMBASIER, a town of Hindustan, in the province of Gujerat, and district of Broach, situated on the headland projecting between the estuaries of the rivers Nerbudda and Myhee. It exports to Bombay and other places, cotton, grain, oil, and piece-goods. The tide rises from five to six fathoms. It is 28 miles from the town of Broach. N. Lat. 22. 2., E. Long. 72. 50.

JUMILLA, a town of Spain, province of Murcia, on the S. declivity of a hill, the summit of which is crowned by a castle, 37 miles N. by W. of Murcia. The streets, though mostly narrow, are paved and clean, and the houses are generally well built. Jumilla is the see of a bishop, and has two handsome parish churches, one of which is adorned with fine frescoes and paintings, two convents, an hospital, and a public granary. There are a number of oil and corn mills in the town, and several branches of manufactures are carried on. Pop. 8397.

JUMNA. This celebrated river takes its rise in the Himalaya Mountains, at the south-western base of the group called the Jumnotri Peaks, at an elevation of 10,849 feet above the sea-level, and in Lat. 31., Long. 78. 32. It first holds a course, for about 100 miles, in a S.W. direction, through the mountainous districts of Gurwhal and the Dehra Dhoon, during which it receives the waters of the Berai-Ganga, the Budeear, Comalda, Rickna, Khootnee, Aglar, Tonse, Giree, and Asun. From the point of its confluence with the last named stream, the Jumna takes a direction, first westerly, then southerly, and flowing through a ravine in the Sewalik Mountains, it enters the plains of Hindustan in Lat. 30. 20., Long. 77. 38. After emerging from the mountains, it throws off the Delhi and Dooab Canals, the former issuing from its right, and the latter from its left bank. It then directs its course in a parallel line to that of the Ganges, until, after passing the cities of Delhi and Agra, it falls into the Ganges at Allahabad, in which, as the holier and rather the larger stream, its name is absorbed. Between Delhi and Allahabad the Jumna receives the waters of many considerable streams, among which may be enumerated the Chumbul, the Sind, the Betwa, and the Cane. Jacquemont styles the Jumna in the lower part of its course, an enormous river; in the rainy season, it is in some places a mile in width, with a very rapid current. The total length of this river, from its source to its confluence with the Ganges at Allahabad, is 860 miles. The streams at the junction are nearly equal in volume; the Ganges, the deeper, with yellow water; the Jumna, the more rapid, with water as clear as crystal, but considered less palatable and wholesome than that of its fellow. The confluence of the two rivers takes place in Lat. 25. 26., Long. 81. 45. The Jumna is only useful as a military barrier to the British territories during the rainy season, when all field operations are impracticable. At this period it may be navigated by flat-bottomed boats of considerable burden; but at other times it is of no utility to commerce. Above its junction with the Chumbul, or 10 miles below the fort of Etayeh, it is fordable, except for a few weeks during the rainy season. From Calpee to its junction with the Ganges there is no obstruction, and only one place where, in the dry season, the passage is rendered difficult by a bank of limestone. It is mentioned by Bishop Heber that its waters act on strangers like the Cheltenham waters. (E. T.)

JUNAGUR, a town of Hindustan, in the province of Gujerat, possessed by an independent native chief, now one of the British allies. He and other chiefs engaged, in 1808, with the Bombay government, not to connive at piracy, and to permit a free and open commerce with the British vessels, on paying the stipulated duties. The chief, a Musselman, styled the Nawaub of Junagur, possesses a territory estimated to contain a population of 284,300 souls. Junagur is distant N.W. from Bombay 235 miles. Lat. 21. 31., Long. 70. 31.

Jungfrau
||
Junius.

JUNGFRAU (*i.e.*, VIRGIN), one of the most picturesque mountains in Switzerland, rises very steeply from the valley of Lauterbrunnen to the height of 13,671 feet. It is one of the ridges of the Bernese Alps, separating the cantons of Valais and Berne. It is in reality a group of mountains, increasing gradually in height, and separated by deep ravines. Of these heights, the Silberhörner, on the W. side, are remarkable for the graceful forms assumed by the snow which covers them. The Jungfrau, like the other mountains of the chain to which it belongs, is characterized by its sharp edge, the summit being not more than two feet broad. As seen from the Wengern Alp in full front, it appears a massive mountain, but as seen edgewise it is narrow and sharp. This, it is said, may be owing to the gneiss rock, of which it is composed, splitting into immense plates. The top of the Jungfrau was long considered inaccessible. In 1811, however, the Brothers Meyer of Aarau laid claim to having reached the summit. In 1828 six peasants of Grindelwald made a successful ascent. On the 28th Aug. 1841, a party of scientific gentlemen, including MM. Forbes and Agassiz, proceeding by the glaciers of Oberaar, Viesch, and Aletsch, succeeded in gaining the top. While they were there the thermometer fell to six and a half degrees below zero. Lichens were found on the highest exposed rocks.

JUNIEN, St, a town of France, department of Haute-Vienne, and arrondissement of Rochechouart, on the right bank of the Vienne, at its confluence with the Glane, 8 miles N.E. of Rochechouart. It is built in the form of an amphitheatre, and is surrounded by boulevards, planted with trees, and commanding pleasant prospects of the surrounding country. The inhabitants are actively engaged in the manufacture of serge, blankets, gloves, hats, woollen cloths, leather, and earthenware. Pop. 5500.

JUNIPER. The juniper tree belongs to the natural order *Conifera*, and is useful, both for its wood and its berries. The Virginian species, which is called *red cedar*, affords a light and durable material valuable in ship-building. It attains the height of about 30 feet, and grows well in barren soil. The berries used for flavouring gin are obtained from the *Juniperus communis*, and about 200 tons of them are annually imported to this country. They are also used for imparting pungency to beer. When roasted and ground, they afford a substitute for coffee. The oil of juniper is an important ingredient in varnish for pictures, wood-work, &c. The berries have also a diuretic property, and are used in medicine. The heavy duty to which they were subject was abolished in 1845. See BOTANY; nat. ord. 220, *Conifera*.

JUNIUS, FRANCISCUS, an eminent scholar and philologist of the seventeenth century, was born at Heidelberg in 1589. His father, whose name was also Franciscus, was a Protestant minister at Leyden, and a professor in the university of that city. He had made himself a considerable name by the Latin translation of the Scriptures, which he had written with the assistance of Tremellius, and which is still favourably known under the name of its conjoint authors. After his death in 1603, his son, abandoning study, followed the military profession, till the truce of 1609 put an end to his hopes of preferment in that career. During the next ten years, he devoted himself solely to study and literary pursuits. Passing over to England in 1620, he became librarian to Thomas Howard, earl of Arundel, one of the best of the many good men who have borne that title. During the thirty years in which he held that office he amassed vast treasures of antiquarian, and especially of philological lore. His attention had early been drawn to the languages of northern Europe, more especially to the Gothic. This tongue is now universally allowed to belong to the great Teutonic family. A dialect of it was, at a very remote period, spoken in Scandinavia, and another at a still

Junius
||
Juno.

more distant epoch, in Moesia and Thrace. For the benefit of the Goths inhabiting these two latter countries, their bishop, Ulphilas, had translated the historical part of the New Testament. His MS. was discovered in the library of the abbey of Werden in Westphalia, and is now preserved at Upsala in Sweden. It is written on vellum leaves of various hues, violet being the predominant colour. The letters are an adaptation of the capitals of the Greek and Latin alphabets, and are all of silver except the initials, which are of gold. Junius did a real service to letters when, in 1665, he published a facsimile of this "codex argenteus," or silver book, by far the most precious relic of the Gothic tongue, and illustrated it with many learned and valuable notes. As early as 1637, Junius had made his name known by his useful essay, in three books, *De Pictura Veterum*. Of this work, he himself published an English version in the following year. But the most useful of all his writings, and one which has been largely turned to account by all English lexicographers, is his *Etymologicum Anglicanum*, in which he evolves the Saxon element of the English tongue with great acuteness and learning. When on a visit to Germany in 1650, he learned that a curious dialect was spoken in some parts of Friesland. Two years' residence and study on the spot satisfied him that the language in question was identical with the Saxon, and proved of great advantage to him in his collateral researches. In 1674 he returned to England, and spent his remaining years at Oxford. He died in 1678 at Windsor, where he had gone to visit his nephew, the illustrious scholar, Isaac Vossius. His valuable collection of MS. he bequeathed to the Bodleian library at Oxford, and the grateful university erected a handsome monument to his memory.

JUNIUS, LETTERS OF. See FRANCIS, *Sir Philip*.

JUNKSEYLO or SALANG, an island of Siam, on the W. coast of the Malay peninsula, and separated from it by a narrow channel about a mile in width, and nearly dry at low water. The island is about 25 miles in length, by 10 miles in breadth, and has at its northern extremity a harbour called Popra, which may be entered over a mud bar during the spring tides by ships drawing 20 feet of water. The anchorage round the island is generally good, with a mud bottom. Previous to the settlement of Prince of Wales' Island, it carried on a considerable trade. It has valuable tin mines which formerly yielded an average of 500 tons annually, but several of the richest mines are said to be now nearly exhausted. Pop. about 6000. N. Lat. 8., E. Long. 98. 30.

JUNO, a Roman divinity, corresponding in most of her attributes to the Here of the Greeks. She was the daughter of Saturn and Rhea, the sister and wife of Jupiter, the queen of heaven; and, as the only married goddess among the Olympians, the especial protectress of marriage and married women. Many places of Greece contested the honour of having given her birth, especially Argos and Samos, which long remained the principal seats of her worship. Though the Samian temple of the goddess was the largest and most splendid, Argos seems to have been the cradle of her worship, which at a very remote period spread through the Peloponnesus, and thence into all the adjoining countries. In Greek sculptures and reliefs Juno is generally represented in a splendid *stola*, sometimes sitting or standing in a light car drawn by peacocks, and attended by the Auræ or air-nymphs, or by Iris, the goddess of the rainbow. At Rome she was worshipped under the titles of *Pronuba*, as the goddess of marriage; *Matrona*, as the goddess of married women; *Lucina*, as presiding over child-birth; *Moneta*, as the warner, in which capacity she had a temple on the capitol on the site of Manlius' house. In this temple the mint was afterwards established. Her other titles were very numerous, but they all had reference to some of the qualities indicated in those already mentioned. The great

Jupiter
||
Jura.

annual festival in her honour, in which all the married women of Rome took part, was called Matronalia, and was celebrated on the first day of March.

JUPITER, the great deity of the Romans, whose attributes corresponded almost exactly with those of the Greek Zeus. The etymology of the word, which is a corruption of Jovis-pater, Dies-piter, or Diu-piter, fixes down its meaning as father of day, or light, or air, and points out Jupiter as having been originally the god of the elements and the controller of the operations of the upper air such as the thunder, rain, snow, &c. Hence in the classics the word is very often used to denote the open air. The root of the word occurs in the kindred languages—Sanscr. *deva*, Greek *θεός*, Latin *deus* and *divus*—which are all nearly allied to Zeus or Ju-piter. In Greek and Latin the oblique cases, Jovis, Jovi, Jovem, are exactly identical with Διός, Δι, Δία, by the same change of letters as in ζυγόν, *jugum*, and *dies*, *diurnus*, *giorno*, *jour*.

In the old mythology there were three deities known under the name of Jupiter. Of these the most celebrated was the son of Cronos and Rhea. He was born in Crete, and his mother's care saved him from his father's cruelty at his birth. When he grew up he dethroned his father, and divided his kingdom, reserving to himself the upper world of air and earth, and assigning to Neptune the sea, and to Pluto the nether world. The deposed monarch called in the Titans to his aid, but though they made head for a time against the usurper, they were finally overthrown and destroyed. His throne established, Jupiter reigned in heaven and earth with irresistible authority and infinite wisdom. Of his wives the most famous was Juno, by whom he had Mars and Vulcan. His marriage, his loves, and his quarrels were among the commonest themes of the old mythology. His worship was widely diffused throughout Greece and Italy. The most famous of his temples was that on the Capitoline Hill of Rome, where he was worshipped under the title of Jupiter Optimus Maximus. On ancient coins and sculptures the father of gods and men was commonly represented as seated on a throne of ivory, grasping in his right hand a sheaf of thunderbolts, and in his left a sceptre. His favourite bird, the eagle, stands on the right side of the throne.

JURA, an island on the W. coast of Scotland, one of the inner Hebrides, 5 miles W. of the Mull of Cantire, between N. Lat. 55.52. and 56. 9., and W. Long. 5. 43. and 6. 8. It is bounded N. by the Gulf of Corrievecan, E. by Jura Sound, S. and S.W. by Islay Sound, and W. by the Atlantic Ocean. The island is 23 miles in length from N.E. to S.W., by 6 miles in average breadth, and contains an area of about 156 square miles. A chain of rugged hills traverses its whole extent, interrupted only by Tarbert Loch, an arm of the sea, which stretches into the island for about 6 miles, nearly separating it into two parts. Jura differs much in aspect from its sister isle, Islay, although belonging to the same geological formation. The soil is inferior and the minerals unimportant. Some good slate is quarried, and a very fine sand found on the western shore is used for making glass. Bere, oats, turnips, and potatoes form the chief crops, the first being raised for the distilleries here and in Islay. Jura belongs to the parish of Jura and Colonsay. In 1851 there were 200 inhabited houses, and a population of 1064. See HEBRIDES.

JURA, an eastern frontier department of France, formerly a part of the province of Franche-Comte, lying between N. Lat. 46. 16. and 47. 19., and E. Long. 5. 16. and 6. 11. It is bounded N. by the department of Haute-Saône, N.E. by that of Doubs, E. by Switzerland, S. by the department of Ain, W. by that of Saône-et-Loire, and N.W. by that of Côte d'Or. It is 114 miles in length from N. to S., and 40 miles broad, containing an area of 1928 square miles. The surface of the country is for the most part irregular, traversed

Jura
Mountains.

as it is by the Jura Alps, from which it takes its name. This mountain range enters the department from Switzerland, and runs in a southerly direction, attaining at some places an elevation of 4000 to 6000 feet. The eastern portion of Jura is the most elevated, the western for a considerable extent is level, while the middle districts form a series of table-lands. The climate is variable according to the contour of the country. In the higher regions it is cold and tempestuous in the winter, and humid during the warmer months. The chief rivers are—the Ain, Doubs, Seille, and Oignon, the latter forming the northern boundary of the department. They are navigable only for small barges. The soil is various. In the level parts to the W. it is a marly clay which is very productive, while in the highlands it is calcareous, thin, and stony. The products are similar to those of the neighbouring departments, including wheat, rye, maize, hemp, wine, and fruit, besides butter and cheese. Cattle and sheep in large numbers are fed on the hill sides, and on the extensive plateaux. Of 1,234,097 acres contained in the department of Jura, 452,498 are arable, 359,286 under wood, 195,242 moors and heaths, 124,907 acres under grass, 51,959 under vines, 29,662 roads, buildings, &c., 13,623 rivers, lakes, canals, &c., and 6920 in gardens and nurseries. Agriculture generally is progressing. The number of wolves and foxes which come from the mountains in winter do considerable damage, especially to the flocks, which require to be tended with great care and kept in strong and high folds. In Jura manufacture is mostly confined to the nicer articles of workmanship, as the making of clocks and watches, and the turning of wood, ivory, bone, and horn. The coarser manufactures include paper, linen, wool, leather, tiles, chemicals, and hardware. The corn grown here is sufficient for the wants of the inhabitants, without having recourse to importation.

The following are the political divisions and population of the department:—

Arrondissements.	Cantons.	Communes.	Pop. 1851.
Lons-le-Saulnier.....	11	212	108,214
Poligny.....	7	152	78,311
Dôle.....	9	138	75,350
Saint-Claude.....	5	82	51,486
Total	32	584	313,361

The principal towns are Lons-le-Saulnier, the capital, (with 9400 inhabitants), Dôle, Poligny, and Saint-Claude.

JURA MOUNTAINS (Ger. *Leberberg*, Fr. *Jorat*), a chain in the S.W. of Switzerland, extending from the canton of Schaffhausen S.S.W. to Savoy. The curve which it forms is about 200 miles long, its breadth being about 30 miles. The Jura chain strikes through Soleure, Berne, and Neuchâtel, parallel to the great range of the Bernese Oberland, and forms the frontier between the Canton de Vaud, and the French department of Jura. The N.W. portion of the range is low; further to the S.W. it is precipitous on the Swiss side; and on the French side it gradually retires in ridges, which successively become lower. Some of the highest points of the range are as follows:—

	Feet.		Feet.
Mont Molesson.....	6577	Dôle.....	5510
Reulet de Thoiry.....	5627	Mont Chasseral.....	5410
Grand Colombier.....	5567	Mont Chasseron.....	5400
Mont Tendre.....	5521		

The following are some of the passes:—Fort Ecluse, close under Mont Vouache; Col de Villeneuve, S. of Grand Colombier; Marchairu, S.W. of Mont Tendre; Echelle, S.W. of Mont d'Or; Verrieres, near Pontarlier; Pierre Pertuis, an immense archway cut through the rock in the Valley of St Imier as early as the time of the Romans;

Jurieu.

and the Klus Pass in Ballsthal, important as a military station in time of war. The chief roads by which the range is crossed are from Nyon into France, over St Cergue; from Orbe, Yverdon, and Neuchâtel, to Pontarlier—the latter of these being by the picturesque Motiers Travers; also from Neuchâtel to Morteau in France; from Biel to Porrentruy; two from Basle to the interior of Switzerland, viz., the Upper and Under Hauenstein; over Stafellegg, between Frickthal and Aarau; over Bötzbegg between Basle and Zurich, an old road which existed in the time of the Romans.

Geologically the Jura chain is a limestone formation, varying between grey and yellow in colour. (For the Jurassic formation, see MINERALOGICAL SCIENCE.) The strata are tilted up sometimes almost perpendicularly, and contain stalactite caverns usual in limestone districts. The more remarkable of these grottoes are in the valleys of Verrieres, Travers, Orbe, and Frick. Beds of marl and clay are found alternating with the limestone. Marble, asphalt and gypsums are also found; iron and coal never in such abundance as to form an important source of wealth. The iron mines have as yet been turned to account only by the French. The same remark applies to the rich salt springs of Salins, Montmorot, Courbauson, Tormont, Grosion, and in the neighbourhood of Poligny, which occur in the chain. The fossils consist of the bones of large Saurians, Didelphis, crabs, shells, ammonites, zoophytes, coral, wood, &c. The trees which at present grow on the range are mainly pine and box. The former are found in large quantities near Poligny, and afford materials to the French for ships of war. The forests of ash, lime, beech, &c., also afford an abundant supply of wood for the iron-foundries and salt works of Arc, Salins, &c. During the rigour of winter the inhabitants occupy their time in cutting all sorts of fancy articles of wood, from which they derive considerable revenue. Wolves are numerous; and the brown bear, at one time so destructive to herds, is still found in the more secluded parts of the Western Jura.

The pastures are covered with the herds which supply the Gruyere cheese. The meadows are so well watered by nature and art that they yield three crops a-year; vineyards occur in the valleys. There are no glaciers, and snow lies only in the sheltered ravines. A remarkable phenomenon, occurring all along the Swiss side of the Jura, is the existence of large detached blocks of granite and gneiss, the chain itself consisting of limestone. The largest of these blocks is the Pierre-a-bot (toad-stone), upwards of 60 feet long. It is about 2 miles above Neuchâtel, and the nearest rock of the same kind is found at Great St Bernard. In the same way protogine blocks occur near Geneva, which must have come from Mont Blanc; while towards the N.W. extremity of the range others occur, which must have come from the direction of the Grimsel. It has been supposed, accordingly, that these masses were borne by huge glaciers along the Arve, the Rhone, and the Aare, across the plain of Switzerland, and thus deposited in the places in which they now stand.

JURIEU, PIERRE, a French Protestant divine of considerable note in his day as a controversialist, was born in 1637 at Mer in Orléanais. Trained at the academy of Saumur, he was sent to Holland, and afterwards to England to finish his studies. Returning home, he was appointed to the living which his father had held at Mer, and was afterwards promoted to the professorship of Hebrew and Divinity in the Academy of Sédan. In 1681 that seat of learning was suppressed; and Jurieu, who had made himself obnoxious to government by a satirical pamphlet against the established clergy, retired to Rotterdam, where he became pastor of the Walloon church. Persecution and exile soured his temper, and the remainder of his life was made up of quarrels and controversies with men of his own or

Jury Trial. the opposite party. At the very moment that he was attacking Beauval, Basnage, and Saurin, he was constituting himself umpire between Bossuet and Fénelon, both of whom he insulted with an audacity little short of insane. When his friends Bayle and Jacquelin interfered to moderate a little the fury of his wrath, he labelled and ridiculed them as if they had been his bitter foes. The Catholic controversialists of the day used to call him in irony the Goliath of Protestantism. Though he is now chiefly remembered for his quarrels, Jurieu was a man of real learning and ability; but all his good qualities were stultified by the bad temper, fanaticism, and occasional insanity that marked alike his writings and his conduct. His works, with the exception of his *Treatise on Devotion*, are all controversial, and have long since passed into oblivion. Jurieu died at Rotterdam in 1713, in the seventy-sixth year of his age.

JURY TRIAL, the most thoroughly expressive feature in the administration of British justice, is, in its essential principle, nothing more than the citizen's right to have the judgment of an impartial committee of his fellow-citizens on any question of fact tending to affect his life, his liberty, or some important patrimonial interest. The origin of the practice has been traced by juridical antiquaries into many and far diverging sources, but they have all been found converging in one direction, by the influence of a common determination, which seems to have ever guided the purpose of the Anglo-Saxons and some other northern races, in the practical application of such existing institutions as could be influenced to the end in view. Guided by a suspicion that the interests of free men could not be entirely confided either to their political rulers or to trained officers of the law, the end they had thus ever before them was to obtain the judgment of a fairly selected body of their equals to decide those simple questions of fact, which all men of sense and perception can better decide according to the rules of every-day life which guide their own actions, than the best trained philosopher or lawyer can by the application of abstract principles or traditional practices. Thus, the jury has been identified with the compurgators of the Saxons; with the inquisitors or assessors who investigated and certified to the Norman lord the extent of his feudal rights; with the peers who represented the interests of the vassals in the court of the feudal seigneur, as parliament represented the interests of the tenants of the crown; with the *judices* of the Romans, and with the *dicasts* of the Greeks. Perhaps the practice of jury trial has drawn something from all of these sources except the last; and we may even see their divergencies typified at the present day. Thus the necessary unanimity of the English jury is supposed, not without reason, to be a relic of the accused Saxon's privilege to clear himself by the oaths of twelve compurgators who believed him guiltless, while the Scottish verdict by a majority bears the character of the old feudal court of peers, where each member gave his council and his vote. However humiliating it may be to trace the "palladium of our liberties" to such a source, yet there is no resisting the evidence, that the practice which had most concern in the formation of jury trial was that compurgation which was one of the ordeals on which men threw their cause, influenced in some instances by superstition, in others by a propensity for gambling, in many by a reliance on their own audacity and discretion, but in none by an expectation that justice would be impartially administered through mere human wisdom. The ordeal of battle lived so long in the theory of English law, as to have been absolutely claimed so lately as the year 1817, as a remedy against the abuse of its rival ordeal, trial by jury. Down to that time, the process called an Appeal in murder enabled the relations of a person said to be murdered to appeal from the acquittal of a jury to another jury, whose verdict, if it condemned the accused, could not, like ordinary verdicts of guilty, be obviated by the royal preroga-

tive of mercy. On this, the last reference to a jury by appeal **Jury Trial** of murder, the accused offered the other ordeal of battle, and the legislature had to deal with, and abolish both these remnants of barbaric practice. (See **APPEAL**.) Nine hundred years earlier—in the tenth century—the northern sagas afford evidence of an almost identical competition of ordeals. Thus, a report, as it may be termed, relative to a litigation by Egil Skallagrimson, is thus translated by a Norse scholar: "When Atli entered the court with the jurors, Egil met him, saying that he had no mind to receive the oath of a jury for his money. The law which I offer, he said, is different; we shall fight a duel here in court, and let the money be his who gains the victory. What Egil said was indeed law, and an ancient custom, for every man had a right to challenge another, whether he was a defender or prosecutor in a cause. Atli said that he would not refuse Egil's challenge. You speak, said he, what I ought to speak. Then Atli and Egil shook hands, mutually ratifying their agreement to fight. He who gained the victory was to have the estates about which they contended" (Egil's Saga; *Repp on Ancient Juries*, 10).

There was still a third class of ordeals, which was essentially the ordeal by miraculous intervention. It is exemplified in the well-known ceremony of walking blindfold on a path where red-hot ploughshares were laid down at intervals. The origin of this ordeal is attributed to the legend of Bishop Boppo, who, when engaged in the conversion to Christianity of the obstinate Jutlanders, was quite unsuccessful, until he tested the truth of his faith by putting his hand in a red-hot iron glove, and withdrawing it unhurt. Such a form of ordeal naturally fell into the hands of the priesthood, who would constitute themselves the agents of miraculous intervention, and it became unpopular among the lay opponents of spiritual supremacy. The ordeal by combat, too, held out more hope to those who wielded force or policy than to those who sought abstract justice; and it at last diverged through the institutions of chivalry to the single combats of later times. The duel so peculiar to the manners of Europe in the present, or perhaps it should more properly be said in the previous generation, was, with its special ceremonies and obligations, the natural descendant of the ordeal by battle. The ordeal by compurgation had much to recommend it in preference to the others among a people eminent for their common sense and their attachment to justice. It adjusted itself to the system of frank-pledge, or common liability. If the person who committed a depredation was not discovered the neighbours were responsible for it. What then more just than to admit the innocence of him who could get a sufficient number of those neighbours to express their belief in it?

In the laws of Alfred, to whom trial by jury, along with many other national institutions, is popularly attributed, the system of compurgation is briefly described thus:—"If any one accuse a king's thane of homicide, if he dare to purge himself, let him do it along with twelve king's thanes. If any one accuse a thane of less rank than a king's thane, let him purge himself, along with eleven of his equals, and one king's thane." Hallam justly warns us not to be misled by the number twelve in identifying the Saxon practice with proper jury trial. From whatever cause it may have happened, this number seems to have been consecrated by the northern nations to numerous collective functions. By the treaty of Ethelred III. certain disputes between Welsh and English were adjusted by a standing committee of twelve men, six of them Saxon and six Welsh. By a law of the same prince, a committee of twelve thanes sat as assessors to the sheriff. Many forms of inquest were held through twelve men. When the throne of Norway became vacant, twelve men from each of the great provinces were selected to undertake the responsible duty of appoint-

Jury Trial. ing a successor; and it is said that the humble ceremony of the return of the constable in the court-leet of an English manor, was the last representative of this method of delegated selection.

No one of these is to be counted the sole origin of jury trial; nor can it be exclusively traced to the feudal practice of the assembling of the chief vassals or *pares curiæ*, to assist the feudal lord with their council. But with that peculiar facility for turning to improved practical account ancient institutions with the least possible change either in their name or their character, through which the British constitution has developed itself, the jury system grew to maturity by absorbing into itself more or less vitality from nearly all these elements. An institution very like it in external character has been found in the customs of Normandy, and was prevalent in several of the French provinces. The English institutions were thus so far impregnated with the Norman character after the conquest, that some antiquaries have held jury trial to be an institution of entirely Norman extraction. In *Magna Charta*, and the other confirmations of liberties by the early kings, it is provided that "no freeman shall be taken or imprisoned, or be disseized of his freehold or liberties or free customs, or be outlawed or exiled, or any otherwise destroyed; nor will we pass upon him, or condemn him, but by lawful judgment of his peers, or by the law of the land." By the more rigid juridical antiquaries it has been called a mistake in Blackstone and other popular writers, to suppose this passage to refer to trial by jury, since it speaks of a separate practice common to England with other feudal countries—the inquisition by peers;—but it was one of the systems out of which the modern practice of jury trial was moulded, and was, in fact, the form in which it existed through a considerable period of the twelfth and thirteenth centuries.

In all their shapes and characters it must be kept in view that the early jurors were rather witnesses than judges. They did not sit to receive the testimony of others, but they communicated the resolution adopted on the ground of their own knowledge. This feature is the more remarkable, as one of the great objects in the theory of modern jury trial is to obtain the decision of persons whose judgments are unwarpd by previous acquaintance with the matter at issue, or the statements of the parties in dispute. The obsolete principle is still represented in the term verdict, *vere dictum* (truly said), as applied to the decision of a jury. In Scotland there is a still more palpable relic of the principle, in the oath put to a jury, which is to the effect, that the juror shall "the truth tell, and no truth conceal," in passing on the assize. The Scottish jury was feudal in its institution, having probably been directly imported from France, and its character as a testifying, rather than an adjudging body, lasted down to a comparatively late period. For instance, in the year 1606, Maxwell of Gribtoun, and his followers, were charged with a murderous attack on his relations, with whom he disputed the possession of the family estates. Among other outrages the offenders laid siege to the tower or keep of Newbie, the family seat and stronghold; and altogether the affair was one of those savage feuds in which all the neighbours were deeply embarked on one side or the other, and any such thing as impartial testimony was out of the question. The Privy Council, which frequently acted as a court of justice, endeavoured to deal with the case, but were impeded by the total want of testimony, and it was brought into the Court of Justiciary on the principle that, as that tribunal had the services of a jury, testimony was unnecessary for its guidance. The Lord-Advocate represented that crimes are often committed secretly, and in such manner that no witnesses can be cognizant of them, and therefore it is that crimes need not be proved by witnesses, but are referred

to the knowledge of a sworn assize, whose determination, according as they are persuaded in their conscience, is a sufficient warrant to themselves, and a just cause of conviction. The notoriety of the offence was all the material offered for the guidance of the jury; and they were told the singular rule of law, that, with this notoriety before them, if they could not conscientiously cleanse or absolve, they must of necessity convict, and they did so. (Pitcairn's *Criminal Trials*, ii., 266.) In the trial of James Scrimgeur for murder in the year 1619, a stand appears to have been taken by the crown lawyers against the admission of witnesses to contradict the accusation, and influence the minds of the jury. "Thair aucht," said the prosecutor, "na witnesses be ressaut befor the assyse, seing the hail poyntis consists *in facto*, and the tryell thair of is remittet to the assyse, quha becumis bayth tryeris and witnesses thairin" (*Ibid.* iii., 470). It used at the same period to be customary to put juries on trial for "wilful error," or a finding contrary to what they knew to be the truth, and the analogy of the character and functions of the jury was carried out in the punishment of such error, which was the same as the punishment for perjury.

The practice of punishing juries for improper verdicts was known also in England, but it disappeared at an early period; and nearly a century before the date of the instances cited from Scottish practice, the jury in England had acquired the function expressed in the obligation of their oath, to "give a true verdict according to the evidence." Although no longer the neighbours of the party concerned, acting on their own personal knowledge of the state of facts, yet, as representing "the country," a jury was looked upon as the jealous protectors of the innocence of their fellow-countrymen. Hence it seems to have been held unfair to arraign a foreigner before a jury entirely consisting of Englishmen, and the jury *de medietate lingue*, of which one half were aliens, was early conceded to the trial of foreigners, and has been a permanent feature of the English administration of justice.

Trial by jury became a peculiar instrument of the common law courts. In the courts of civil or ecclesiastical origin, the method of inquiry was by commission; but the inquisitorial secrecy in which this process was supposed to be involved has always rendered it unpopular; and in equity proceedings it became the practice to take the aid of the common law courts, and send disputed matters of fact to be decided by juries on issues. The staple questions on which juries decide in England are, in the first place, all the heavier offences, and, in the second place, disputed matters of fact in litigations before the common law courts. In these it came to be the form, that when issue was joined by the simple and distinct announcement, "And this the said A prays may be inquired of by the country;" or, "And of this he puts himself upon the country, and the said B does the like;" that the court, by the appropriate writs, caused to be summoned on such a day "twelve free and lawful men, who are of kin neither to the foresaid A nor the foresaid B, to recognize the issue of the truth between the said parties." Before an indictment for a crime comes before the real working jury, it is still customary for the grand jury "to find a true bill;" but this preliminary, which was formerly one of the solid barriers against oppression, has become little better than a ceremony. Antecedent to the grand jury, in cases of violent death, is the coroner's inquest, which has become a somewhat clumsy means of achieving the very desirable object of preserving a certified official record of all the circumstances connected with the discovery of a dead body, or the occurrence of a violent death. Thus, a person tried for murder in England or Ireland passes three times through the ordeal of a jury. The function of juries has in all parts of the United Kingdom been considerably extended by the pro-

Jury Trial. gress of railways and other public works; the property taken from private owners, under the parliamentary powers, being in disputed cases valued by a jury.

It is natural that the adjustment of the boundary between the function of the jury to ascertain the fact, and that of the court to apply the law, should have been subject to much jealous contention. If the rules of law prevented the jury from getting access to a knowledge of the facts, or failed to give effect to their finding, the efficacy of jury trial as a protection to public justice was annihilated. On the other hand, if juries got beyond their proper function, the law of the land would become as mutable as the opinions of every casual assemblage. The law has always assumed the prerogative of dictating what is to be evidence; and as it could not, in all cases, keep the jury from being influenced by that which it declared not to be evidence, the clumsy expedient of new trials on account of verdicts contrary to the evidence was adopted. In Scotland, in the reign of Charles II., the courts endeavoured, in criminal cases, to take out of the hands of the jury the plain question of "guilty" or "not guilty," by settling beforehand a train of facts whence guilt might be presumed, and requiring the jury to find whether these facts were or were not established. It was not until the trial of Carnegie of Finhaven for the murder of Lord Strathmore in 1728, that they re-established their privilege to give a general finding of guilty or not guilty.

The class of persons of whom juries are to consist has varied at different periods, and the specific qualification of the jurymen is at present peculiar to each of the United Kingdoms. The function has always been deemed a burden rather than a privilege; and several classes of citizens have obtained exemption from it, more by their influence than by their unfitness to perform the jurymen's functions. It has always been a popular belief that butchers, from their supposed callousness to suffering, are excluded from juries; but there is no such law.

The qualifications of ordinary jurymen in England, as fixed by the Act of 1825 (6th Geo. IV., c. 50), may be taken as a type of the class who now serve as jurymen throughout the United Kingdom. Every man between the ages of twenty-one and sixty, who has no special exemption to plead, is liable to serve, if he possess landed property under any of the ordinary tenures, which are specifically enumerated in the Act, worth L.10 a-year; or who is a leaseholder for twenty-one years, or life, of land worth L.20; or who is rated as a householder for poor-rates or inhabited house-duty, at L.30 in Middlesex, or L.20 elsewhere; or who occupies a house containing not fewer than fifteen windows.

There are very complex arrangements throughout the empire for preserving, through the aid of the parochial and other petty officers, an accurate and impartial record of jurors. There is a double object to be served in the accurate impartiality of the lists,—the one to save qualified jurymen from the oppression of too frequent service; the other to disable persons interested from "packing" a jury, or placing men upon it who will serve their object. The panel of jurors—or the whole body out of whom the twelve who are to act are selected by lot—is returned by the sheriff according to an established rotation. The Act of 1825 rendered it unnecessary to summon a separate panel for each cause to be tried at an assizes, and appointed one panel, of not less than forty-eight, or more than seventy-two, jurors to be summoned. The Act authorizes two panels, one for the civil, and one for the criminal work of the assizes. The right of challenge is one of the arrangements for securing an impartial trial. The suitor may challenge the array, as it is termed, or the whole jury, if there be any fundamental blemish in its constitution; or he may bring against any particular jurymen a challenge, per poll, on disqualification, personal interest, or other similar

objection. A person under trial for a capital offence has the privilege of objection to one jurymen after another, to the number of thirty-five, by peremptory challenge, without assigning any cause. Questions may, on special application, be tried by what are called "special juries." The special jury list consists of those who are entered as esquires; and the privilege of resorting to such a jury has generally been used in cases where the nature of the litigation rendered it of moment that a verdict should come from persons skilled in the matter in dispute. The arrangements for adjudication by special juries were adjusted in the Common Law Procedure Act of 1852.

It has already been seen that in the development of the jury system Scotland did not follow the same course as England; but the general spirit of the English system has had an influence over the tendency of its neighbour. In Scotland there is no coroner's inquest. In ordinary criminal prosecutions there is no grand jury, and the ordinary jury or assize, consisting of fifteen, give their verdict by a simple majority. In questions of treason the English system was, much to the discontent of the country, introduced immediately after the Union. Jury trial in civil cases was inconsistent with the traditional spirit of the Scottish legal tribunals. The Court of Session, consisting, like the penal jury, of 15 members, represented the old judicial committees of parliament, or the grand jury of the nation. Their method of procedure had, down to a very late period, several elements of a popularly deliberative character, distinguishing them in an emphatic manner from the rigid legal technicalities of the English common law courts. In the year 1815 it was determined that the English system of jury trial should be brought into Scotland, and a separate court of commissioners was appointed to carry it into effect. In 1830, after what was deemed a sufficient trial of the system in this separate form, it was made a portion of the ordinary jurisdiction and procedure of the Court of Session. Trial by jury in civil questions has not been popular in Scotland; and whatever good it may have accomplished has certainly been balanced by much costliness, uncertainty, and tedious protraction of litigation. The English system of pleading has, through a long course of refining, brought itself to that simplicity of assertion and denial which at once opens the issues on which a jury have to decide. But the Scottish system of pleading was formed for the purpose of reaching results in a different manner. It was predicted by law reformers, that what in England offers the means of a rapid and distinct decision on the point in dispute, would in Scotland merely add an element of prolixity and confusion to a method of procedure already too cumbrous; and the prediction has, at least in popular estimation, been verified. It is a common remark, that the threat of a jury trial is one calculated at once to enable a rich man to frighten his opponent into submission. A people not trained to a traditional veneration for every feature of the system, could not see a logical conformity in making twelve men swear that they would do justice according to their consciences, and then coercing them by confinement and starvation until they had agreed to be all of one mind. In 1854 the stringency of the rule of unanimity was accordingly relaxed by a provision that, after six hours' deliberation, a verdict returned by nine of the twelve jurymen should be effectual (17th and 18th Vict., cap. 59). Some attempts were made, but in vain, to introduce this arrangement in England.

In estimating the general merits of the jury system, its inapplicability to communities not trained to it must be counted. Like many other safeguards of freedom, it is effectual only for the protection of those who raise it for themselves. Among people trained by arbitrary governments to submit when they must, and rebel when they can, it has been found utterly futile; they cannot compre-

Jury Trial. hend any use of a power or a privilege save the serving of their own immediate objects. Even in France, where it was introduced after the Revolution in criminal questions, it has given imperfect satisfaction. It has been said that in important, and especially in popular cases, juries have been led astray by excitement; while for conducting the ordinary routine of dry business, the country does not afford sufficient public spirit. It will probably soon be seen how far juries may be effectually replanted in those Scandinavian states, whence, in their indigenous growth, they have been long uprooted.

Whether in England itself jury trial is not worshipped with a superstitious and indiscriminating reverence is a fair question. No one will deny its inestimable services in criminal trials. It is not only a protection against political oppression and the procrustean cruelty of implacable legal technicalities, but it tends to bring the method of discerning truth in questions between man and man to scientific perfection. It is quite true that there are eminent difficulties before the prosecutor who requires to bring all his evidence up at one moment, and fit together its several parts before a public audience. From the sound rule, that no man can be twice tried, any defect in the completeness or the adjustment of the evidence is fatal, and a criminal escapes. But the rigid exactness thus enforced only tends to give the evidence adduced to a jury a perfection which the method of secret inquisition does not require. There are few nobler objects than a great trial, in which the results of legal and detective skill, all brought to a focus, are exhibited before the world, bringing out, as in a drama, the unravelled intricacies of some great crime.

For civil cases, the great utility of the jury has consisted in its being a method of keeping the facts of each case absolutely separated from the law. The importance of this absolute separation can scarcely be over-estimated; and though it might seem possible that it should be accomplished in a less ceremonious manner, yet respect is due to the opinions of those who hold that the employment of men taken from the ordinary affairs of life, and restrained neither by technical rules of law nor official routine and prejudice, brings daylight into courts of justice, and enables them to walk in the proper direction of their functions to do substantial justice between man and man. It is proper, in conclusion, to mention a tentative arrangement for substituting the decisions of a judge for the verdict of a jury, when parties consent to an issue being so tried. It was introduced by an Act of 1850 regulating the procedure in Scotland, and it was transferred to England by the Common Law Procedure Act of 1854 (17th and 18th Vict., c. 125). It is said, however, that the arrangement so sanctioned has been rarely adopted. The measure for deciding small debt questions in England in county courts passed in 1846, had previously adopted a modified jury system. The number of jurors was to be five, but unless a jury was specially demanded, and the required notices sent, the function of deciding the fact as well as the law was left to the judge.

(J. H. B.)

JUSSIEU, ANTOINE LAURENT DE, the most illustrious member of a family which has given several great names to science and was long known as the *dynastie botanique* of France, was born at Lyon, April 12, 1748. At the age of seventeen he left his native town to study medicine in Paris. He took up his abode with his uncle Bernard de Jussieu, one of the lecturers on botany in the Jardin du Roi, and a man of immense scientific learning and skill. The teaching and example of this relative first gave the young student a taste for the science which he may be said in a great measure to have created, or at least re-modelled. He did not, however, wholly abandon medicine; but the thesis which he defended on taking his degree in 1770—"An Economiam Animalem inter et Vegetalem Analogia"—indicates

clearly enough the bent that his thoughts and studies had already taken. In this same year he was made professor of botany in the Jardin du Roi, in room of Lemonnier, whose duties as first physician to the king prevented him from lecturing regularly in person. This rapid and sudden promotion took him by surprise. He was only twenty-two years of age, and his knowledge was so far from being adequate to the duties of his chair, that he had to prepare carefully the evening before the prelections of the following day. His indefatigable zeal and industry soon brought him abreast of the science as then taught; and his Memoir on the family of the Ranunculaceæ procured his admission into the Academy of Sciences, and was incorporated in the *Transactions* of that body. In this memoir one sees the germs of that system of classification according to characters which he afterwards extended and applied to the whole vegetable kingdom. To illustrate the new method he could not have fixed upon a more safe or convenient order than that which he selected; and he used to say in after life that it was while engaged in preparing this memoir that he first felt himself truly a botanist. A wider field was presently opened up to him. The Jardin du Roi was at this time arranged according to the system of Tournefort. In 1774 the number of specimens had so greatly increased, that by the advice of Buffon it was determined to replant the garden. Jussieu profited by this occasion to send in to the authorities a scheme of his method, which was finally adopted. The general idea of it was undoubtedly borrowed from what was called the *Catalogue of Trianon*, which had been drawn up by his uncle Bernard. Many of the details, however, were so different, and the scheme itself was applied on such a large scale, that the credit of the whole fell to the younger Jussieu, especially as his uncle, now aged and infirm, and imbecile, had become a victim to the hereditary scourge of blindness. The new views were given to the world in a Memoir, entitled "Exposition d'un Nouvel Ordre de Plantes adopté dans la Démonstration du Jardin Royal," and embodied in the *Transactions of the Academy of Sciences* for 1774. Great as were the merits of the "Natural" system, Jussieu was himself well aware that as first evolved by him it was merely provisional. Accordingly, the next twelve years of his life, that is from 1775 to 1787, were entirely spent in testing it in his class lectures, and modifying it according to the new genera which were brought to him by travellers from every quarter of the globe. When at length, in 1778, he began to publish, so thoroughly had he matured his plan in its minutest details as well as its general outline, that he did not find it necessary to transcribe the whole work before consigning it to the press. Leaf by leaf his MS. was put in type as soon as it was written. The printing of the work lasted fifteen months, during all which time Jussieu, according to the testimony of his son, was never more than two sheets a-head of the compositors. The difficulty experienced in wringing either "copy" or "revises" out of his hands, and the elaborate care with which he corrected and often re-cast the proof-sheets, are dwelt upon by his biographers as sufficient evidence that he was really the author of his own work, and was not merely transcribing or translating into Latin his uncle's MS. notes, as was at one time alleged against him. Making due allowance for all this care, however, we are still surprised that the composition of the *Genera Plantarum* should have taken so long as it did. It only comprises some 2700 genera; and in the then state of botanical science could hardly have contained more. The botanical text-books of the present day contain from 9,000 to 10,000 genera. When at length the work appeared, it was at first very coldly received, and nowhere more so than in the author's native country. The artificial or sexual system of Linnæus had been adopted in all the schools, and had taken root so firmly that it was impossible at once to eradicate it. The

Jussieu. hurricane of revolution was likewise sweeping over France, and men were too busy with politics to spare time for deciding between rival systems of botany. In England and Germany it began, though slowly, to find favour with the learned few; and when order was at length restored in France, its merits secured its adoption as the text-book in most of the scientific schools. It was not, however, till about the year 1820 that the Jussieuan system came to be recognised and publicly taught everywhere in England and America as well as on the Continent. The leading feature of this, as of every other natural system is, that it brings together all those plants which are allied in all essential points of structure, and takes into account the true affinities of plants on a comparison of all their organs. Assuming that as the lowest species which has no cotyledon in its embryo, that as next higher in the scale which has one, and that as highest of all which has two, Jussieu divided plants into the three primary groups of *Acotyledones*, *Monocotyledones*, and *Dicotyledones*, under which he included fifteen classes. Of these classes one is Acotyledonous, three are Monocotyledonous, and eleven Dicotyledonous. The three Monocotyledonous classes are distinguished by the position of the stamens, whether inserted on the thalamus (hypogynous), attached to the calyx (perigynous), or to the ovary (epigynous). Dicotyledonous plants are divided into Apetalous (monochlamydeous)—plants having a calyx only; Monopetalous (gamopetalous)—plants having united petals; Polypetalous—plants having separate petals; and Diclinal—plants which are unisexual and incomplete: the last constitutes the fifteenth class, while the other ten classes of Dicotyledons, included in the three other divisions, are determined chiefly by the position of the stamens and the corolla in relation to the ovary. Under these classes he included 100 orders. A tabular view of Jussieu's "Natural" system is given in art. BOTANY, part ii., chap. 2.

When the Revolution broke out, Jussieu, very much against his own wishes, was drawn into its vortex. In 1790 he was made a member of the municipality of Paris, and was entrusted with the supervision of the hospitals and charities,—an office which he held for two years. In 1793, when the Jardin du Roi was re-organised as the Museum of Natural History, Jussieu succeeded Daubenton as director and treasurer, and signalized his year of office by laying the foundation of what has since become one of the best, if not actually the best scientific library in Europe. From this time till 1820 he continued to enrich the *Annales* and *Mémoires* of the museum with contributions, bearing chiefly on the orders, genera, and species of his own system. After that year the infirmities of old age and blindness disabled him from keeping abreast with the progress of the science to which he had himself given the strongest impulse. In 1826 he resigned his chair at the museum in favour of his son Adrian, to whom he transmitted the virtues as well as the talents of his family. The next ten years of his life were spent in dictating a new edition of the *Genera Plantarum*, in which all the recent discoveries were to be embodied. But his strength was not equal to the task, and he never got beyond the introduction, which, however, is itself sufficient to show that to the last he retained that union of knowledge and philosophy which places him at the head of all the botanists of France. While lingering over this last effort of his mind he was carried off after a short illness, September 17, 1836, in the eighty-ninth year of his age. Jussieu's life, long as it was, and embracing the stormiest era of French history, was a happy and a peaceful one. His temper, less austere than that of his uncle, was singularly equable; and the fierce attacks that were often levelled against him never drew from him an angry or even a harsh retort. To the last he retained undiminished the affection of his family and the respect of his friends.

JUSTICE-CLERK OF SCOTLAND. See SCOTLAND.

JUSTICE OF THE PEACE. Before the institution of this office, as it now exists, certain public functionaries in England, such as the Lord Chancellor, the Judges of the Queen's Bench, sheriffs, and coroners, were invested with powers, as they still are, for the maintenance of the public peace. Besides these there were, however, in earlier times, persons appointed to that duty by the freeholders in their county courts, under authority of the common law of England, as well as others, who were bound to discharge it by the tenure of their lands. These persons were at length superseded by justices on the accession of Edward III., who issued writs commanding each sheriff to cause the peace to be kept within his bailiwick. The statute 1st Edward III., c. 16, passed soon after, transferred the appointment of these newly created conservators of the peace to the king; and when, by 34th Edward III., c. 1, they acquired the power of trying minor offences, they received the name of Justices. Since that time the sovereign has been constitutionally recognized as the chief conservator of the peace; and commissions are granted at the royal pleasure, authorizing any one to cause it to be kept, with power to punish whoever may break it. The form of the commission was first settled in 1590; and, among the number of those included in the commission, one or more were named—popularly styled Justices of the Quorum—without whose presence the others were not entitled to act. This distinction is, however, not now kept up, and all are equally empowered to act. On their appointment they must take the oaths prescribed by law. Their services are rendered gratuitously; and hence they are usually called the unpaid, to distinguish them from stipendiary magistrates. A variety of statutes were passed between the reign of Edward III. and Henry VI., regulating the numbers, qualifications, and residences of justices in England, but these are not now of much practical importance. In order to exclude persons from the office who were unsuitable on account of their poverty, the statute 18th Henry VI., c. 11, required that each justice should have lands to the value of £20 per annum. To meet the depreciation of money, the statute 5th George II., c. 11, raised the required sum to £100 per annum, clear of all deductions, and subjected every person who acted without that qualification to a penalty of £100. This statute, and the 6th and 7th Vict., c. 73, § 33, disqualify every practising attorney, solicitor, or proctor, from acting as a justice of the peace. The 34th section of the latter of these statutes declares, that this disqualification does not extend to any town, having justices within its limits, by charter or commission. The statute 18th Geo. II., c. 20, continues the requirement, that the English county justice shall possess £100 per annum from heritage, but excepts the justices of the English burghs.

In Scotland, we find the office of justice of the peace mentioned so far back as the Act 1587. In cap. 82 of that year, the sovereign was authorized to grant commission to noblemen of all ranks, and landed gentlemen, actual indwellers in the shires, the number for each shire being limited, together with four of the council of every burgh. The following statutes were afterwards passed for the better regulation of the office:—1609, c. 7; 1617, c. 8; 1633, c. 26; 1661, c. 38. This last is worthy of perusal. An act, passed in 1686, c. 20, vested the appointment of clerk to the justices in the crown. In 1707 a new commission for Scotland was issued, conferring on justices the same powers, in reference to the customs and excise, as were exercised by justices in England; and the Act 6th Anne, c. 6, declared that justices in Scotland are "authorized to do, use, and exercise over all persons within their several bounds, whatever doth appertain to the office and trust of a justice of the peace, by virtue of the laws and acts of Parliament made in England before the Union, in relation to, and preservation of, the public peace; provided,

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nevertheless, that in the sessions of the peace the methods of trial and judgment shall be according to the laws and customs of Scotland." With commissions for Scotland there are issued writs authorizing the appointed justices to be sworn; but, by 7th Geo. III., c. 9, the oaths do not require to be taken oftener than once in each reign. In Scotland no property qualification is required. When the office is conferred on sheriffs or magistrates, they cease to hold it on the termination of their office. By the 6th George IV., c. 48, § 27, it is declared that "no solicitor or procurator in any inferior court in Scotland, or the partner of any such person," shall act as a justice in any county in Scotland during the time that he is in, or connected with any such business.

The powers of justices of the peace are conferred and defined, 1st, By the terms of the royal commission in their favour; and, 2d, By the terms of a great variety of Acts of Parliament, conferring on justices the power of carrying them into effect. The leading clause of their commission runs thus,—“to keep and cause to be kept all the ordinances and statutes for the good of our peace, and for the preservation of the same, and for the quiet rule and government of our people;” and “to chastise and punish all persons that offend against” the same; and “to cause to come before you, or any one of you, all those who, to any one or more of our people concerning their bodies, or the firing of their houses, have used threats; to find sufficient security for the peace, or their good behaviour towards us and our people; and, if they shall refuse to find such security, then there in our prisons, until they shall find such security, to cause to be safely kept.” They are also empowered to grant warrant for apprehending all criminals, and for remitting them to be dealt with in higher courts, when the offence charged is one which they cannot themselves try. The Acts of Parliament which have been passed from time to time, within the last two centuries, have devolved on them an amount of business which our limits do not enable us even to specify. We may mention generally, that under special statutes they hold both criminal courts and small-debt courts, and decide in matters connected with the poor, with the highways, the excise and customs, and other revenue matters, fishings, game, factories, and public-houses. They judge also in questions between master and servant, and in cases of petty thefts and trifling assaults. They hold quarter-sessions, which they may continue and adjourn when necessary. Two justices form a quorum for trial and judgment, both in England and Scotland. One justice may, however, grant a warrant to apprehend an accused party, and bring him into court, except where any special statute requires that to be done by more than one. They never had the power, in Scotland, of trying cases with a jury like the quarter-sessions of England. They are not entitled to judge or act in any matter which affects the interests of themselves or their near relatives. No military officer can act as a justice of peace in the billeting of soldiers under the Mutiny Act; nor millers or bakers under the Bread Act; nor tradesmen in charges of violent combination against the workmen of the same trades; nor brewers, maltsters, or distillers, or dealers in exciseable commodities under the Licensing Act, or in excise questions connected with their trades.

As the office of justice is conferred by, it subsists only during the pleasure of the crown; so that the issuing of a new commission, in effect, recalls the former one, as two cannot exist for one place at one time. The commission also expires in six months after the demise of the crown. Sometimes a writ passes the Great Seal, discharging a particular justice from any longer exercising the office. The entire commission may also be suspended by a writ of *supersedeas*, and it may be revived by another writ called a *procedendo*. The office is of great public utility. It

must necessarily, however, on account of the great number of justices required, be conferred on many persons who have had no training for the discharge of its duties; and, therefore, most statutes which confer a cumulative jurisdiction, require the concurrence of two justices where one stipendiary magistrate (who must necessarily have undergone a professional training) is sufficient. Wherever a justice of peace, however, acts conscientiously and consistently with the statute which he is called on to enforce, he is protected from all personal responsibility; but if he plainly exceed the powers conferred on him by the statute, or if he act maliciously and without reasonable and probable cause, he is justly liable in damages. Malice is not required to be proved where the justice acts grossly irregularly, or plainly beyond his powers. Acting within his powers it is otherwise; but not where, in the words of Lord Corehouse, his proceedings are “extra-judicial, lawless, and oppressive.” Lord Chief-Commissioner Adam remarked, however, that, “if there was probable cause, the magistrate is protected, in whatever situation his mind may have been.” For their protection in England, see the statute 24th George II., c. 44; and both in England and Scotland, see 43d George III., c. 141, by which it is declared, that even when their judgments are quashed, the justices in actions of damages, besides the penalties levied, shall not be liable in more than two pence of damages, nor costs of suit, unless the acts complained of “were done maliciously, and without any reasonable and probable cause.” Nor are they liable in any consequences, though their judgment is quashed, where they can prove that the plaintiff was guilty of the offence of which he was convicted, and had undergone no greater punishment than the law assigns to such an offence. See also 9th George IV., c. 29, § 26; and 1st William IV., c. 37; and 11th and 12th Vict., c. 44. A calendar month’s notice must be given to the justice before the raising of the action, and it must be raised within six months after the act complained of.

JUSTICIAR, or JUSTICE-GENERAL. See SCOTLAND.

JUSTIN MARTYR, one of the fathers of the early Christian church, who flourished in the second century, was born at Flavia Neapolis, near Shechem in Samaria. The exact date of his birth is much disputed, some authorities assigning it to A.D. 89, others to A.D. 118, while others again adopt intermediate dates. He seems to have entered upon the study of philosophy with an ardent desire to arrive at the knowledge of God; but neither the system of the Stoics nor that of the Peripatetics, which he tried in succession, brought him to the knowledge for which he thirsted. The next system which he determined to study was that of the Pythagoreans, but owing to his ignorance of some of the elementary sciences, he was denied admittance to the schools where that philosophy was taught. Foiled in this resolution, he sought refuge in the doctrines of the academy. Expecting to be favoured with a sight of the Divine Being, he was, upon one occasion, walking alone by the sea-shore, when he was met by an old man who pointed out to him the errors of Plato, and advised him to turn his attention to the Jewish prophets as inspired by the Spirit of Truth. For the fifth and last time Justin changed his creed, and about the year 132 made a public profession of Christianity. The Christians, at the time when Justin joined them, were suffering greatly from the false rumours regarding their character and principles, which were industriously circulated by their enemies. One of Justin’s earliest acts was to address an *Apology* to the Emperor Antoninus in defence of his fellow-sufferers. His appeal was so far successful as to gain some little toleration for the new faith. His second *Apology*, addressed to the Emperor Marcus Aurelius was called forth by the renewed persecution of the church, but had unfortunately no other effect than that of making its author a conspicuous mark for vengeance. In both these

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Justin
Martyr.

Justinian. *Apologies* Justin turned to such good account his knowledge of the Greek schools, that Tertullian and many of the early writers called him *The Philosopher*. About the year 165 Justin was himself called upon to seal his testimony with his blood. He might have saved his life by consenting to offer sacrifice to the heathen gods; but he refused, and his refusal was punished with death. As his life and death had been both in an eminent degree those of one bearing witness to the truth, he became known to posterity as the Martyr.

The writings of Justin are chiefly valuable as having been written at so early a period in the history of Christianity, for they display nothing approaching to genius, and are faulty in method, reasoning, and style. His most important works are the two *Apologies* already mentioned, and his *Dialogue with Trypho*, a learned Jew, in which he describes his conversion to Christianity, and defends that faith from Jewish prejudices and assaults. Many other works are attributed to him, of which that on the *Unity and Sovereignty of God* is alone accepted as genuine. Of the rest the majority are spurious, and the whole at best doubtful.

The best editions of his works are those of R. Stephanus, Paris, 1551-1571, in Greek; of Commelin, 1593, in Greek and Latin; of Prudentius Maranus, 1742; and of Otto, Jena, 1842-4, in 2 vols. 8vo, with a valuable preface and notes. The *Apologies* and the *Dialogue with Trypho* have been both translated into English; the former by William Reeve, M.A., in 1809; and the latter by Henry Brown, M.A., in 1755. A good idea of the life, times, and theology of Justin is given in Bishop Kaye's *Writings and Opinions of Justin Martyr*, Cambridge, 1829; and a still better in Semisch's two essays on that same subject, Hamburg, 1842, 1848.

JUSTINIAN I., FLAVIUS ANICIUS, surnamed *the Great*, emperor of Constantinople and Rome, was born in May A.D. 483, at Tauresium in Dardania. His parents were obscure, but his uncle, Justin I., who had risen to a high position in the court of Constantinople, took Justinian under his care, attended to his education, and resolved to further his fortunes. As Justin was without issue, Justinian wisely identified his own interests with those of his uncle, and manifested great zeal in the destruction of certain persons who were considered dangerous to the imperial safety; and as a reward for his services he was appointed commander of the forces in Asia. But he consulted his own interests better by remaining in Constantinople and ingratiating himself with the senate. In A.D. 521, that body raised him to the consulship; and as he still continued to increase in favour, the senate recommended the emperor, who was now old and infirm, to adopt his nephew into a share of the government of the empire. This was done in 527, Justinian having reached the age of forty-four. In a few months afterwards Justin died, and his nephew was crowned by the patriarch of Constantinople. The coronation was accompanied by most magnificent festivals, and vast quantities of money, amounting to 288,000 pieces of gold, were given to the populace. The new emperor persisted in having Theodora, who had been a common actress, crowned along with him as his empress. The first years of this reign were spent in repelling the inroads of the Huns and the Arabs; and an extensive war was carried on in Armenia with the Persians, which ended in an annual payment of 440,000 pieces of gold to Chosroes, the Persian king.

At this time the struggle between the *Blue* and the *Green* factions, as they were called, raged within the city; and a conflagration, kindled by them for the sake of massacre, would have cost Justinian his empire but for the courage of Theodora, who exhorted him to fight for his empire to the last extremity. See **CONSTANTINOPOLITAN HISTORY**.

The rebellion was quelled, and Justinian being established on the throne, turned his arms against surrounding enemies. His generals, Belisarius, Germanus, and Narses

fought the battles of the empire against the Vandals in Africa, the Goths in Italy and Spain, the Persians in the East, and the countless hordes of Huns, Franks, Bulgarians, Slavonians, and others who were ever ready to invade the imperial dominions when they had the least prospect of plunder. When the successes of the generals above mentioned had restored peace, the emperor turned his attention to the formation of a complete code of laws, the execution of which has conferred great lustre upon his name. (See **CIVIL LAW**.) He died in November 565, in the eighty-third year of his age, of which he had reigned 38.

The time of Justinian is a bright epoch in history; but when his character and conduct are fairly canvassed, it is found that much of the merit for ability displayed during his reign attaches to others, and much demerit to himself. The glory of the warlike operations carried on against the enemies of the empire, belongs to his faithful generals Belisarius, Germanus, Narses, and others, for Justinian himself was no warrior, nor did he ever enter a field of battle. It is true he supplied his generals with abundant means for carrying on active warfare, but it was by the most merciless rapacity exhibited towards his own subjects. They were often compelled to bring their stores for the supply of the troops without receiving adequate remuneration, and sometimes without any remuneration at all. The emperor could well afford to scatter hundreds of thousands of gold pieces amongst the people, when this money so distributed was quite certain to find its way back to his own treasury by the oppressive taxes which were imposed upon all branches of industry, and by his monopoly of the silk trade. In the same way, at the expense of his subjects, he could gratify his desire for associating his name with art, by building splendid monuments in almost every important town of his empire. Procopius has written a work, *De edificiis Justiniani*, which contains an account of these buildings; and one of them, the church of St Sophia, so impressed the emperor when he saw it in all its splendour, at its dedication, that he exclaimed in a transport of delight, that he had surpassed Solomon himself! But besides avarice his character was deformed by religious intolerance. Zealous in the cause of orthodoxy as then professed, he persecuted those who held different opinions from his own, and tried to expel them from his empire; yet he ended by becoming a Nestorian himself. Having risen to power by unscrupulous means, he was naturally suspicious; and his ungenerous treatment of Belisarius has left an indelible stain upon his memory. (See **BELISARIUS**.) Although he raised Theodora, who was a mere courtesan, to be his empress in spite of all remonstrance, yet, when he had set his heart upon Amalasuntha, the queen of Theodot, it is pretty certain that he would have sacrificed both Theodora and Theodot in order to gain the object of his desire. It is to his *Pandects*, *Institutes*, and *Novels*, that Justinian is chiefly indebted for his fame; and perhaps his merit in respect of these has been overrated. In private life he was a man of hard application, frugal, and even penurious; for though he frequently helped those who were suffering from the effects of plagues and earthquakes, yet he turned a deaf ear to the complaints of those who were suffering from the rapacity of his ministers.

JUSTINIAN II., surnamed *Rhinotmetus*, succeeded his father Constantine IV. as emperor of the East, and reigned from 685 to 695, and again from 704 to 711. His reign was signalized by his wars and truces with the Saracens and the Christian Maronites of Mount Lebanon, by the dissensions created in the church through his intolerance, the bloody persecution set on foot against the Manicheans, and the insatiable rapacity with which he taxed his subjects in order to raise the means of gratifying his sumptuous tastes. His cruelty and extortions at last maddened his subjects into rebellion. Under the command of the famous soldier Leontius, they rose *en masse*, dethroned Justinian, cut off

Justinus. his nose (from which indignity he obtained the surname of Rhinotmetus), and banished him to the Crimea. Leontius was proclaimed emperor, and after a reign of three years was in his turn dethroned and banished by Tiberius Absimarus, who wore the purple for seven years. Meanwhile, Justinian, having escaped from the Crimea, had married the daughter of Busris, the khan of the Khazars. Compelled by the intrigues of Tiberius to quit his new home, he fled to Terbelis, king of the Bulgarians. With an army of 15,000 horsemen he suddenly pounced upon Constantinople, slew his old rivals Leontius and Tiberius, with thousands of their partizans, and reinstated himself on the throne. Cruelty, rapacity, and disaster marked his second reign. Conspiracies again broke out, and Justinian, to the great joy of the whole Roman world, was at length dethroned and put to death by Philippicus Bardanes, A.D. 711.

JUSTINUS, a Latin historian, whose name appears in some MSS. as M. Junianus Justinus, and in others as Justinus Frontinus. Of his personal history absolutely nothing is known. He was at one time believed to have flourished in the reign of Antoninus Pius, as the preface of his history was addressed to that emperor. But the passage in which Antoninus' name occurs has now been proved to be spurious, and there is nothing by which to indicate this historian's era until a reference to him by St Jerome fixes it down to some point before the fifth century A.D. Justinus' name has been kept alive by his work entitled *Historiarum Philippicarum, libri xlv.*, which he himself describes as derived solely from the *Universal History* of Pompeius Trogus, a Latin writer of the Augustan age. The work of Trogus has perished, with the exception of a few fragments preserved in quotation by Pliny and others; but the *prologi*, or abstracts prefixed to each chapter, and giving a synopsis of its contents, still remain, and indicate the general tenor of the history. The work, as its title suggests, was, strictly speaking, an account of the Macedonian monarchy; but the author, imitating the example of Herodotus and Theopompus, indulges in frequent digressions, and discusses every subject, however remotely connected with the main narrative. The first book is devoted to the Assyrians from the time of Ninus to that of Sardapalus, and to the Medes and Persians to the reign of Darius Hystaspes. The next five books discuss the wars between Greece and Persia. The way is thus paved for the main theme,—the rise, progress, and decline of the Macedonian empire,—which occupies the next ten books. Then follow six books devoted to Carthage and Sicily. Sixteen books, from the twenty-fourth to the fortieth, are allotted to Greece, Egypt, and Asia, and the gradual subjugation of these countries to the Roman power. The rise of the Parthian monarchy engrosses the next two books. The forty-third is devoted to the early history of Rome and Marseilles; and the forty-fourth contains scattered notices of the Ligurians and Spaniards.

Though Justin's work is generally described and criticised as an epitome of the great history of Trogus, it is in reality nothing more than a selection from that work of such passages as struck the compiler's fancy. The general idea, however, is that Justin designed to furnish a systematic abridgement of Trogus' work, and on that understanding he has been severely censured for the careless and slovenly way in which he has performed his task. There is, indeed, great reason to regret that he has seen fit to dwell at length on trifling subjects, and to dismiss with a few words others of deep importance. At the same time it should not be forgotten that, with all its omissions, intricacies, and digressions, Justin's work contains a large mass of valuable learning, which, but for him, would never have been recorded at all. A sufficiently honest, though not very discreet compiler, he might have given a high value to his work by bestowing a little more care on the plan,

and, above all, on the chronological and geographical portions of it. His style,—very far, indeed, from being perfect,—has, nevertheless, the merit of clearness, occasionally even of elegance. There have been numerous editions of Justinus. Among the best may be mentioned those of Groëvius, Leyden, 1683; Hearne, Oxford, 1705; Gronovius, Leyden, 1719 (reprinted in the *Variorum Classics* in 1760); the Bipontine Society, 1802; Wetzel, 1806; and Froscher, Leipzig, 1827. The English translations by Codrington, 1664; Thomas Brown, 1712; Nicolas Bayley, 1732; John Clark, 1732; and Turnbull, 1746, all of which were published in London, have gone through several editions.

JUSTINUS I., Emperor of the East, A.D. 518-527, was a native of Tauresium, in Dardania, who, discontented with his humble lot as a shepherd, set off to Constantinople to seek his fortunes in the capital. Enlisting in the guards of the Emperor Leo, he greatly distinguished himself in his and the two following reigns, and attained successively the rank of tribune, comes, senator, and finally commander-in-chief of the troops which, some years before, he had joined as a private. On the death of Anastasius, in 518, he was raised to the purple by the army, being then in his sixty-eighth year. He was brave, and fond of war; and clergy and people both ratified the choice of the troops. Though he could neither read nor write, and was wholly unskilled in civil affairs, he was always able to preserve order throughout his vast empire, and to select the best men to the special offices of state. He made over the civil administration to the quæstor Proclus, a faithful and able officer, whose policy gave equal satisfaction to the emperor and his subjects. Himself an orthodox churchman, he brought about a reconciliation between the Eastern and Western Churches in 520, which was maintained for a considerable time undisturbed. In that same year he adopted his nephew, the famous Justinian, with whom from this time he shared the cares of state. It was at his nephew's instigation that Justin caused the Goth Vitalianus to be assassinated. This turbulent and unruly spirit had recently been raised to the consulate, and his conduct in that office had roused the jealousy and suspicion of the court. Justin invited him to a sumptuous banquet, and there caused him treacherously to be murdered in presence of himself and Justinian. This cruel act throws a dark stain on the characters both of uncle and nephew, and led to fierce contests between the green faction, by which Vitalian had been beloved, and the blue faction, which enjoyed the favour of the emperor. In 522 a war broke out with Persia, which continued for several years, without any decisive result. It was in this war that Belisarius first gave proof of his military genius. Justin died in 527, soon after having conferred the dignity of Augustus on his illustrious nephew. Though rude, illiterate, and warlike in his tastes, Justin was a wise and successful ruler. He was perfectly honest, a sincere well-wisher of his subjects, and ever ready to promote their best interests. His insight into human character was both deep and sound, and to his tact in singling out and promoting men of talent was due much of the happiness and success of his reign.

JUSTINUS II., Emperor of the East, from A.D. 565 to 578, was the nephew of the great Justinian, and immediately after his uncle's death in 565 was raised to the throne by the senate and the army. The opening of his reign augured well for the future. He paid the debts of his predecessor, distributed large sums of money among the poor, published an edict of universal toleration for religious belief, recalled many persons who had been banished for heresy, and restored peace to the church. As soon as he was fairly seated on the throne, however, his real character began to show itself. His rapacity, cruelty, and pride raised a host of enemies against him, abroad as well as at home. One of his victims was the famous eunuch Narses, the exarch of

Justinus I.
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Justinus II.

Juterbock
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Juvenalis.

Ravenna, and the great champion of the empire against the Goths. Justin's wife Sophia, a haughty and ambitious woman, hated Narses on private grounds, and persuaded her husband to recall him, adding, in her own hand, that he ought to leave the cares of state to men, and live for the future among the maidens of the palace, who would teach him to spin. Stung to the quick the old general opened negotiations with Alboin, king of the Longobards, and invited him to pour down his hordes upon Italy, an invitation which the barbarian chief was not slow of accepting. Narses, repenting of his treachery, died of a broken heart when he saw the fairest provinces of Italy laid waste by fire and sword. His repentance came too late, and the whole of northern Italy, along with a great portion of the peninsula, was soon lost to the Roman empire. Persia, under its great king Chosroes, next rose in arms against Justin. The fortress of Dara, the bulwark of the empire, was taken, and the fairest provinces of Asia were overrun and devastated as completely as those of Italy had been by the Longobards. These accumulated disasters unmanned the spirit of the emperor, who resigned the conduct of affairs into the hands of his wife. An ignominious peace was obtained from Persia on the payment of a large annual tribute. Justin, hopeless of retrieving his losses, named Tiberius, the captain of his guard, as his successor. This great general had been practically at the head of affairs since the year 574, and in the September of 578 Justin publicly resigned in his favour. This last act of his life showed a sense and wisdom which he had never before displayed. He only survived his abdication by about a month.

JUTERBOCK, a walled town, capital of a circle of the same name, in the Prussian province of Brandenburg and government of Potsdam, on the River Rohrbach, 40 miles S.S.W. of Berlin, with which it is connected by railway. It has manufactures of woollen and linen cloth, and some trade in horses, cattle, and wool. In the church of St Nicholas is the indulgence-box taken from Tetzels by a knight to whom he had previously sold a pardon for any sins he might commit. At Dennewitz, in the vicinity, on 6th September 1813, the Prussians under Bülow defeated the French under Ney. Pop. (1849) 5632.

JUVENALIS, DECMUS JUNCTUS, one of the greatest of the Roman classics, the details of whose personal history are both scanty and obscure. What little we know of his life is chiefly derived from a biographical sketch of him, purporting to be written by Suetonius, but more probably the work of some later hand. According to this authority he was the son or foster-child of a rich freedman of Aquinum, where he was born about A.D. 40, in the reign of Caligula. Though carefully trained to the bar, and extremely fond of declamation, he never pleaded professionally, but practised his art in the schools as a mental discipline. The praise awarded to some satirical lines which he composed on the actor Paris, then high in favour and power at court, encouraged him in that kind of composition. He suppressed his satires, however, for some time; but when at length he published them in his sixtieth year, they took the world by surprise, and gained a great name for their author. The severity with which the old poet lashed the degeneracy of public morals and the decay of the old national greatness became offensive at court, and Hadrian, on pretext of rewarding his services, gave him the command of a cohort, which was then on its way to garrison a frontier fortress of Egypt. Soon after reaching this place of honourable exile Juvenal died of chagrin and disappointment. At the time of his death he was in his eighty-first year. Such is the gist of the great satirist's life as given in the sketch attributed to Suetonius. Meagre as it is, however, much of it has been already shown by modern criticism to be unauthentic. All that we can accept as undoubtedly true is that the poet was born, or at least spent much of his time

at Aquinum during the latter half of the first century after Juvenalis. Christ. From other sources we know that he lived on terms of intimate friendship with the poet Martial.

To the scholar the works of Juvenal are of the highest value, from the insight which they give into the social and moral condition of Rome, during the first century of the Christian era. A richer or more tempting field has seldom opened to the satirist than offered itself to him. The foundations of the old Roman virtue had been sapped, and the worst vices had been openly practised and fostered by the Neros and Domitians. On such an age the genial humour and sly sarcasm of Horace would have been wholly thrown away. None who could not boldly and even fiercely denounce its vices, crimes, and follies, would have gained a hearing. Conscious of this, and imbued in no small degree with the vicious taste of the schools, Juvenal adopted that style of splendid and vehement declamation, which, had his force and weight of thought been less, might have degenerated into sheer bombast and hyperbole. Even as it is the rhetorician not seldom throws the moralist into the shade, and a wholesome lesson is often sacrificed to a brilliant point. This indeed is the capital defect of his writings,—they are too ambitious, too obviously artistic, too manifestly designed to dazzle or to stun. At the same time it must be remembered, that, in so far as his aim was to produce effect, he succeeded as no Roman author, Horace himself hardly excepted, ever did. There is no Latin composition, from which so many thoughts and expressions have passed into the common speech of all languages, as the Tenth Satire of Juvenal—the highest flight of the satiric muse of Rome. It is in its author's best vein. Fulfilling the negative conditions of satire in ridiculing and denouncing vice and folly, it also fulfils the positive conditions of a moral essay by alluring and encouraging to virtue. In loftiness and purity of sentiment it stands unsurpassed in Greek or Roman literature, and the moral precepts it embodies may safely claim a high place even in the Christian ethics of modern times. In all his other satires the gold is mixed with much alloy. The vices which he lays bare and chastises he displays with a revolting minuteness of detail which disgusts the pure, while it feeds the morbid appetite of the depraved mind.

It is not easy to see how a man of strictly pure life should have that wonderful familiarity with the social corruptions of Rome under the empire which Juvenal delights to show. We have no grounds for asserting that he was personally tainted with any of those hideous vices which he describes with so much force and fulness. Yet his satires are manifestly the fruits of a personal experience, and their teaching is of that directly practical kind, which could only have been aimed at by one who had tracked vice and crime to their haunts, and seen with his own eyes their operation and results. It quite accords with the laws of human nature, that he should in his youth have drained the cup of dissipation, and when wisdom came with maturer years and cooler blood, that he should lash with no sparing hand the follies of his own early life. Many, if not most of the great satirists of the world, have merely reflected in their works their struggles with temptation, their defeat at first, and their final victory.

The editions of Juvenal are very numerous. That of Ruperti is the most popular, and, so far as the text is concerned, is the best; Heinrich's, in virtue of its notes and commentaries, is better still. The editions of Henninius, Leyden, 1695; and Achaintre, Paris, 1810, are also highly valuable. The English translations of Juvenal are numerous. Those of Holyday, Gifford, Badham, and Hodgson, are the most common. Dryden translated the First, Third, Sixth, Tenth, and Sixteenth Satires with great force and spirit, though often with little reference to the original. The French prose version of Dusaulx, more elegant and correct than that of Gilbert, is less forcible and characteristic.

K.

K
||
Kaempfer.

K, the eleventh letter, and eighth consonant, of our alphabet, is formed by a guttural expression of the breath. Its sound is much the same with that of the hard *c*, or *qu*, and it is used for the most part only before *e*, *i*, and *n*, in the beginning of words, as *ken*, *kill*, *know*, and the like. It used formerly to be always joined with *c* at the end of words, but is now omitted. Thus, for *publick*, *music*, we now write *public*, *music*, and so on. However, in monosyllables it is still retained, as *jack*, *block*, &c.

K was borrowed from the Greek *kappa*, or the Oriental *kaph*, and finds only an ambiguous place in occidental alphabets. Priscian looked on it as a superfluous letter, and says that it was never to be used except in words borrowed from the Greek. Dausqueius, after Sallust, observes that it was unknown to the ancient Romans. Indeed we seldom find it in any Latin authors, excepting in the word *kalende*, where it sometimes stands instead of *c*. Carthage, however, is frequently spelt on medals with a **K**—*SALVIS AUG. ET CAES. FEL. KART.*; and sometimes the letter **K** alone stood for *Carthage*. M. Berger has observed, that a capital **K**, on the reverse of the medals of the emperors of Constantinople, signifies *Konstantinus*; and that on the Greek medals it signified *KOLAH SYPIA*, *Cole-Syria*. Lipsius observes, that **K** was a stigma anciently marked on the foreheads of criminals with a red-hot iron. For its modern use, see ABBREVIATIONS.

K is also a numerical letter, signifying 250. When it had a stroke above it, **K̄**, this letter stood for 250,000. **K** on the French coinage denotes money coined at Bordeaux.

KAEMPFER, **ENGELBERT**, a celebrated naturalist and scientific traveller, was born in 1651 at Lemgo, in the principality of Lippe Detmold in Westphalia, where his father was rector of the church of St Nicholas. Trained at first by his father, he went to prosecute his studies at Hameln in Saxony, and afterwards at the schools of Luneburg, Hamburg, and Lubeck. In all these places he distinguished himself by the ardour and success with which he studied history and geography, and the languages both living and dead. After graduating as Ph. D. at the University of Cracow in Poland, he removed to Königsberg in Prussia, where he spent four years chiefly in the study of medicine and the natural sciences. His early training, whether accidentally or by design, seems to have been fitted exactly to make him what he afterwards became, the most enlightened traveller of his age, and the worthy forerunner of the Pallases, Tourneforts, and Humboldts of a later age. In 1681 Kaempfer visited Upsal in Sweden, and many tempting proposals were made to him if he would consent to settle in that country. His desire for foreign travel, however, led him to decline these offers; but he gladly agreed to accompany as secretary the embassy which Sweden was at that time preparing to send through Russia to Persia. Setting out from Stockholm on the 20th of March 1683, they passed through Moscow, where they were sumptuously entertained, and arrived at Astrakan on the shores of the Caspian Sea. There they embarked for Persia, and landing at Nizabad pursued their way to Ispahan, which they entered in a little more than a year from the day they set out on their travels. Kaempfer was the first naturalist that ever set foot in the more sequestered spots of Georgia, and the strange aspects and operations of nature that met him at every step are described in some of the most interesting chapters of his *Amoenitates Exoticae*. With his appetite for foreign travel thus whetted, Kaempfer refused to return to Europe with the embassy. Various reasons, most of them very absurd, have been assigned by his biographers

for his conduct. His real motive was to pursue his scientific investigations in the rich and fresh field of the East. A residence of two years in the Persian capital enabled him to master the natural history and botany of the surrounding country. At the end of that period he entered the service of the Dutch East India Company as head surgeon of their fleet which was then cruising in the Persian Gulf. An illness with which he was seized at Gomron disabled him for active service for two years, and, indeed, nearly proved fatal. In 1688, however, he set sail in the Dutch fleet for Batavia, touching at various points of interest on the coasts of Hindustan, Ceylon, and Sumatra. Arriving at his destination in 1689, he spent the winter of that year in investigating the natural history of Java, and in the month of May following set out to Japan, as physician to the embassy which the Dutch used to send yearly to that island. He embarked in a ship which was to touch at Siam, and had thus an opportunity of visiting Ayuthia, which has since been supplanted by Bang-kok as the capital of the country. In the September of 1690, he landed at Nagasaki, where he was allowed to remain for fully two years, during which he twice visited Jeddo, the capital. His adroitness, insinuating manners, and medical skill overcame the habitual jealousy of the natives, and enabled him to elicit much valuable information which he has embodied in his *History of Japan*. Returning to Europe in 1693, and graduating as doctor of medicine at Leyden in the following year, he settled quietly down in his native city, there to spend the remainder of his days. His design was to edit and publish his travels at his leisure; but being appointed physician to the Count of Lippe, he soon found himself involved in the cares of an extensive medical practice. In 1712 he gave to the world his *Amoenitates Exoticae*, intended, as he remarks in the preface, as a kind of prelude to a complete edition of his works. Unfortunately, however, he did not live to carry out his plan. An unfortunate marriage, and other domestic calamities following thick upon each other, broke down his health, already sufficiently impaired by his travels. He died on the 2d of November 1716, in the sixty-sixth year of his age.

The original of Kaempfer's *History of Japan* has never been published, for what reason is unknown. Sir Hans Sloane bought from his heirs a MS. copy which was translated into English by J. G. Scheuchzer, and published in 2 vols. fol. in 1727. From this English version the work has been translated into French and German. This work of Kaempfer's is probably unique among books of travels. After an interval of nearly two centuries, it remains as true and applicable to the actual condition of Japan as when its author first set foot on the island. Subsequent travellers have acknowledged the conscientious accuracy of his descriptions of the civil and religious, as well as physical, condition of Japan. To the general reader it is intensely interesting for the rare information which it gives. The great work of the American expedition does not even yet supersede that of the German naturalist.

KAFFA, **THEODOSIA**, or **FEODOSIA**, a fortified sea-port town of Russia on the S.E. coast of the Crimea, and on the western side of a wide gulf of the same name; N. Lat. 45. 2, E. Long. 35. 20. It occupies the site of the ancient Theodosia, an important town of the Greek kingdom of the Bosphorus. It was founded by Milesian colonists at an early period, and was taken after a long siege by Leucon, king of the Bosphorus, who named it after his wife Theodosia. He likewise made it a port, and gave certain advantages to Athenian vessels coming there for purposes of trade, so

Kaffa.

Kafraria.

that in a short time it became a place of great commercial importance. After many vicissitudes, it came into the hands of the Genoese in the thirteenth century, and became the seat of an extensive commerce with the East by way of Persia and the Caspian. During this period it is said to have contained 80,000 inhabitants, but after its capture by the Turks in 1474, its prosperity rapidly declined. Since it came into their hands, the Russians have attempted to revive its former greatness, but with very partial success. Kaffa was declared a free port in 1806; and a museum of antiquities, botanic garden, and public library have been established by the Russian government. The harbour is protected by a promontory from the S. and S.W. winds, and there is excellent anchorage with deep water two cables' length from the shore. Pop. (1849) 8435.

KAFRARIA, OR KAFIRLAND, taken in its widest sense as denoting the country chiefly peopled by the Kafirs, extends along the eastern shores of South Africa, from the River Keiskamma, the eastern boundary of the colony of Cape of Good Hope, to Delagoa Bay, a distance of about 700 miles, and stretches inland to a distance varying from 150 to 400 miles from the sea. Within these limits are included,—1st, British Kafraria, lying between the Rivers Keiskamma and Kei. 2d, The country between the Kei and the River Umzimkulu, the south-western boundary of the British colony of Natal, called in recent maps Kafraria Proper. 3d, The colony of Natal, extending along the seaboard from the Umzimkulu to the Rivers Tugela and Umzimyati, and inland to the Drahenberg, or Kathlamba Mountains. 4th, The country ruled by the Zulu-Kafirs, stretching from the last-named rivers to the vicinity of Delagoa Bay. 5th, The country formerly called the Orange River sovereignty, now the territory of the Free Dutch republic of that name; and, 6th, The country north of the Vaal River, under the rule of another section of Dutch boers, and called the Transvaal republic. In the narrower sense of the term, however, Kafraria is taken to include only the two first-named districts lying between the eastern boundary of the Cape Colony and Natal.

In this article, our remarks on the physical features of the country apply only to those narrower limits, but part of our observations on the people will include the whole Kafir race.

In its general formation, the country resembles the Cape Colony, rising from the sea in a series of steppes or plateaux, the walls of which are formed by ranges of hills nearly parallel to the lofty range which, for the most part, forms its N.W. boundary, consisting of the Amatola, the Winterberg, Stormberg, and Kathlamba, or Drahenberg Mountains. These steppes, however, are not so well defined as in the Cape Colony, and the surface of the country is extremely varied, in some parts presenting plane and tableland, in others a succession of gently sloping hills; in others lofty mountains rear their rugged and scarped sides, intersected by deep ravines, which form the beds of mountain torrents. The latter description particularly applies to the Amatola Mountains in British Kafraria, which have formed the stronghold of the Kafirs on so many occasions. A considerable part of British Kafraria is covered with dense bush; consisting, for the most part, of a thorny mimosa. Beyond the Kei, however, the upper part of the country is generally open and devoid of wood, except in ravines and the folding of the hills; but near the coast there are fine timber trees, in some places forming dense forests, in others scattered singly or in clumps, and giving the country a beautiful park-like appearance. The rivers in Kafraria run nearly parallel to one another, flowing from the several ranges of hills into the Indian Ocean. The most considerable of them are the Kei, the Umbashi, the Umtata, the Umsimvubu, or St John's River, and the Umzimkulu. They flow, for the most part, between high banks fringed with brushwood or in some places shaded by large trees,

and, like all mountain streams, are low and feeble in the dry weather, but swollen and turbid in the rainy season. None of them are navigable, except the St John's or Umsimvubu, which will admit small craft to a distance of about 10 miles from the sea. There are no harbours on the coast, except that of East London, in British Kafraria, but it is scarcely more than an open roadstead, and far from safe.

The vegetable productions of Kafraria are similar to those of the Cape Colony. Oats, barley, rye, and most kinds of vegetables grow well in the valleys, and where irrigation can be applied. Wheat will also grow, but the crop is more uncertain than that of other grain just named, which are all, more or less, subject to rust, smut, and mildew. Indian corn and a species of millet, called Kafir's corn, thrive remarkably well. Indigo is indigenous. Cotton has been planted on a small scale, and found to grow extremely well. The forests produce a variety of timber for building and cabinet-making.

The wild animals of Kafraria are similar to those found in the Cape Colony. In regard to domestic animals, horned cattle thrive well, but sheep are subject to disease, unless kept on the higher ridges. Poultry of all kinds thrive well.

The climate differs in some respects from that of the Cape; the greatest amount of rain falls in the spring and summer. The winter is generally dry. In summer the heat varies from 70° to 90°; in the winter it is seldom below 50° in the day time; but the nights are very cold, and snow falls on the mountains. The temperature is subject to great changes within the space of very few hours; but the climate is, on the whole, extremely healthy.

British Kafraria, not being within the Cape of Good Hope, is not subject to the legislation of its parliament; it is, however, under the governor of that colony, who rules it by regulations based chiefly on military law. Its chief town is King William Town, on the left bank of the Buffalo River, about 40 miles from the sea. Besides it, there are several forts duly garrisoned, scattered over the country. In the country between British Kafraria and Natal, there are no European settlers, except missionaries and a few traders. It is entirely under native rule. The British government, however, has agents or residents in some places, whose duty it is to advise the native chiefs, and to protect British interests. They have not, however, hitherto been found very useful.

The name Kafir is of Arabic origin, meaning infidel. It was applied to the natives of the south-eastern shores of Africa by the early Portuguese discoverers, who probably received it from the Moorish navigators of the Mozambique Channel. It was afterwards adopted by the Dutch settlers of the Cape. By them and their British fellow-colonists the name is applied to all the tribes of the race living within the limits mentioned in the beginning of this article, whose form and appearance, and kindred languages, show a common origin. The several tribes are distinguished by names generally derived from former chiefs from whom they or their ruling families sprung. The tribe called *Amazosa* inhabit the country from the Keiskamma to the Umbashi river. This is the tribe, the various branches of which have so often come into collision with the Cape colonists and the British forces. The Amatambu or Tambookies dwell on the high land at the sources of the rivers N. of the Amazosa, and nowhere approach the sea. Between the Bashi and the Umzimkulu Rivers dwell various tribes, the most powerful of which are the Amaponda, under their chief Faku, and the Amabarca. Beyond the latter river the natives of Natal are composed mostly of refugees from the Zulu country. They are incorrectly called Zulus, being chiefly fragments of tribes formerly inhabiting Natal or its neighbourhood, who were broken up by the Zulu conqueror Chaka, and incorporated into his nation. Beyond Natal, again, as far as Delagoa Bay, the country is inha-

Kafraria.

Kafraria. bited by various tribes; but, being under the rule of the Zulu king and his tribe, it is commonly called the Zulu country. The native tribes of the Orange River and Transvaal countries of the Kafir race are—the Basutos, the chief of whom is the famous Moshesh; the Manlits; the Bechuanas; and the Matabele.

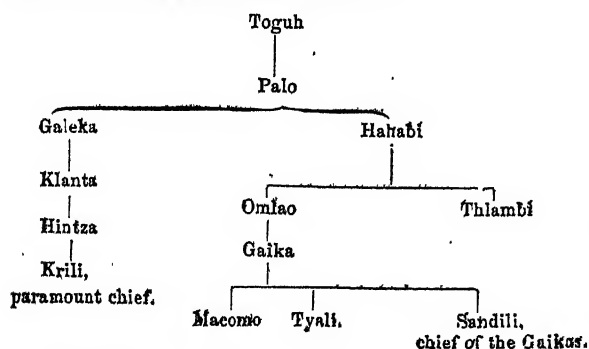
Various conjectures have been formed as to the origin of this race. That of Sir John Barrow is most plausible, viz., that they sprung from a tribe of Bedouin Arabs, who moved from the N.E., gradually traversing the eastern border of Africa. In this case, however, they must have mingled and intermarried during their passage with some negro races, since their appearance shows some affinity to both races.

The question, how long, and under what circumstances, they occupied the country they now and recently possessed in South Africa, has given rise to some discussion. We believe the following is the substance of most that is known on the subject. Although there are strong grounds for supposing that the race at no very remote period were strangers to South Africa, yet it is certain that the Portuguese discoverers in the sixteenth century found them inhabiting the country from Delagoa Bay to the southward of Natal. It is, however, probable that they did not then extend S. of the River Kei; and it is certain that they were not S. of the Keiskamma, since there is reliable evidence to prove that at a comparatively late period they took possession of the country, then belonging to the Hottentots, between the latter river and the Gamtoos. This fact is admitted by all who have studied the subject—the only question being as to the mode of acquisition; some contending that it was by purchase from the Hottentots, others that it was by conquest. The latter is the more probable opinion.

Without entering on the history of the several tribes comprising this widely scattered race, we shall confine ourselves to a brief sketch of the recent history of the two tribes with which this country has had most intercourse, viz., the Amaxosa, or Cape Frontier Kafirs, and the Amazulus, or the Kafirs near Natal; together with a short statement of the more prominent traits common to the whole race.

The Amaxosa. This tribe, the Amatambu, and the Amaconda, probably sprung from a common ancestor named Zwide, who lived upwards of 300 years ago. The eldest, or most direct branch of his descendants is doubtless represented by the Amatambu or Tambookies; since, by the other two tribes they are regarded as the royal race, and the chiefs generally take some of their wives from them, whose sons inherit their father's rank, to the exclusion even of elder sons by other wives.

The immediate ancestor of the Amaxosa was Toguh, from whom descended Palo. The latter had two sons, from whom sprung the principal chiefs on the frontier; Galeka the eldest, the founder of the Amagalekas, whose head is the paramount chief of the Amaxosa, and Hahabi, whose sons were Omlao and Thlambi. Gaika, the son of the former, was the founder of the Gaikas and the father of Macomo, Tyali, and Sandili, the chief of the branch. From Thlambi the Ithlambis sept take their name. The subjoined table will render this account clearer:—



The Gaikas and Thlambis live close to the Cape frontier, the Amagaleka, beyond the Bashi River.

The Dutch settlers at the Cape first came in contact with the Kafirs of this tribe about 1740. The Gamtoos River was then their boundary, and mutual injuries led to frequent skirmishes between them, but the first regular war took place about 1780, when a *commando*, as it was called, of Dutch drove the Kafirs over the Great Fish River, which was then settled as the boundary between the two races. A guerilla warfare, however, was still being carried on, when, in 1795, under the circumstances mentioned in our article on the Cape, the British took possession of the country, which they held till 1802, when it was restored at the peace of Amiens. During this period the Dutch boers settled on the eastern frontier gave the British authorities great trouble. A force under General Vandeleur was sent against them, and succeeded in reducing them to order, but it afterwards encountered a body of Kafirs under the chiefs Congo and Thlambi, with very doubtful success. From 1802 to 1806, when the Dutch again held the Cape, matters continued in the same position on the eastern border,—the boers, in more or less open rebellion against the government, and carrying on guerilla warfare with the Kafirs.

In 1806 the Cape was finally taken possession of by the British. The Kafirs had again taken possession of the country west of the Fish River, and committed depredations on the colonists, when, in 1811, Sir John Cradock, with a considerable force defeated them and drove them beyond that boundary. It was during this campaign that the Landtdrost Stockenstrom was murdered by the Kafirs at a conference which he had sought for the purpose of inducing them to lay down their arms. In 1817 Lord Charles Somerset, governor of the colony, in consequence of disturbances on the frontier summoned a chief named Gaika to an interview with him, in which he acknowledged that chief as the head of Kafirland, gave him certain privileges, and held him responsible for the acts of the nation. This was a great error, and led to mischievous results. Gaika was not entitled to this rank. He was merely head of a sept of Amaxosa Kafirs, the paramount chief of whom was, as we have stated above, the chief of the Amagalekas at this period, one Hintza, whom Gaika acknowledged as his chief. The first consequence of this ill-advised measure was, that Gaika being attacked by a kindred chief named Thlambi, sought for and obtained the assistance of the government, which then improperly interfered in native quarrels. This led to the invasion of the colony by the Kafirs under Thlambi and Congo, and the war in 1819, during which Graham's Town was attacked by the enemy, who were repulsed with great loss by a small force under Colonel Willshire. The result of this war was the expulsion of the Kafirs from the country between the Great Fish and Keiskamma Rivers, which was declared to be neutral ground, to be occupied neither by colonists nor Kafirs, but still some of the latter were allowed to occupy it. Some time after this, in 1820, 5000 emigrants, mostly Scottish, were sent by government to the eastern part of the colony, and were at first partly located in this neutral territory by Sir Rufane Donkin, who was acting as governor in the absence of Lord Charles Somerset. The latter, however, on his return, refused to confirm this arrangement, and ordered the settlers to withdraw within the former limit of the colony, but his lordship shortly afterwards gave away large tracts of land in this territory to persons the nature of whose claims will not admit of close investigation. A year or two after this, an attempt was made, under the sanction, as it is said, of the governor, to seize the person of Gaika during a time of peace. The design was frustrated, and it served only to provoke the enmity of the Kafirs and produce hostilities. In 1828 the whole of the Amaxosa Kafirs were threatened with destruction by Chaka, the ter-

Kafraria. rible Zulu chief, who had subdued Natal, and was advancing towards the Cape frontier. The Kafirs called upon the government for aid, but the Zulu chief withdrew his forces mainly, we believe, out of respect for British authority. A force however was sent against him, which unfortunately attacked and defeated a tribe under the chief Matuwana, which had been in no way concerned in the meditated invasion, but had itself been driven from Natal by the Zulu armies. It was at this time that a large body of Kafirs of various tribes, driven from Natal and its vicinity by Chaka's armies, took refuge with the Amaxosa Kafirs chiefly with the Amagaleka branch, by whom they were reduced to a species of slavery under the name of Amafingu or Fingoes. In 1828, Lord Charles Somerset was succeeded in the government by Sir Lowry Cole. In 1829 the chief Gaika died, and was succeeded by the infant Sandili, his son by his chief wife; but during the minority of the child, the government of the tribe now called Gaikas devolved on his elder half-brother Macomo. Macomo and his followers had hitherto been permitted to live on the Kat River, part of neutral ground, but now, on account of his attack on the Amatémbu Kafirs, he was ordered to leave that locality, upon which a settlement of Hottentots was established with a view of helping to check the inroads of the Kafirs. This is the origin of the celebrated Kat River settlement. In 1833, Tyali, another of Gaika's sons, who had been allowed to live on the neutral ground, was removed to beyond the Keiskamma. Shortly afterward, both Tyali and his brother Macomo were permitted to return within this colony, but were again expelled. The course pursued towards these chiefs seems to have been very vacillating and to have been among the causes which led to the next war.

Sir Benjamin D'Urban assumed the government in 1834, and towards the close of that year a vast mass of Kafirs poured into the colony, headed by the chiefs Tyali, Macomo, and Xoxo, sweeping over the frontier district, murdering the farmers in their course, and burning their homesteads.

The colonial authorities were unprepared for the invasion, but Colonel (afterwards Sir Harry) Smith and the governor proceeded at once to the frontier, and with a force of about 3000 men, about one-half being regular troops, marched into Kafirland. In the course of about nine months the Kafirs were subdued, and a treaty was entered into with them, by which the country as far as the River Kei was declared to be British, and the people subjects of the crown. During this war an incident occurred which has given rise to much discussion. Hintza, chief of the Amagalekas, who, as such, was paramount chief of the Amaxosa Kafirs, that is, of nearly all the Kafirs on the frontier, had openly refused to take part in the war; but the governor suspecting, not without reason, that he had covertly assisted to foment it, and had received cattle stolen by the Kafirs actually engaged in hostilities, crossed the Kei River and encamped near the chief's residence. Hintza, to save his country from destruction, went to the camp of the governor, who demanded of him compensation in cattle, for the property stolen from the colonists, and also the liberation of the Fingoes, who, as mentioned above, were held in a species of servitude by the Amaxosa Kafirs. To these terms, Hintza assented, and voluntarily remained in the camp, though told he was free to depart. A few days afterwards, a report arrived that the Kafirs were murdering the Fingoes. This the governor supposed to be the result of Hintza's orders, and that chief was informed that having broken the terms agreed to, he would be held responsible for the safety of the Fingoes, upon which he sent to his people to stop the massacre, and his order was obeyed. * The cattle demanded as compensation for the colonists' losses not having arrived within the stipulated time, Hintza was tried. He was considered responsible for their payment. He stated that his people would obey his orders, and produce the

cattle, if he appeared among them supported by a British force. The governor sent him with a detachment of troops under Colonel Smith towards the Bashi, but he was warned that any attempt to escape might cost him his life. On the road the chief clearly evinced his desire to prevent his people's cattle from being taken, and, at length, being well mounted, and seizing a favourable opportunity, he attempted to make his escape. He was pursued by Colonel Smith and those about him, and, after a desperate chase and personal struggle, he was shot dead, by a Mr Southey, in self-defence it is alleged, as the chief was on the point of stabbing him with an assegai. Other versions have been given of this transaction, but the above we believe to be substantially correct. Lord Glenelg, the colonial secretary, who had previously taken a very unfavourable view of it, was led by a subsequent enquiry to consider that Hintza had been, if not the fomentor of the war, at least engaged in a secret alliance with its authors. The account of the chief's death is taken from Sir Harry Smith's and Mr Southey's statements, but we have had opportunities of hearing them confirmed by the evidence of impartial and most trustworthy persons who were near the scene.

The proceedings of the governor were disapproved of by the colonial minister, the ceded country ordered to be restored, and Sir Benjamin D'Urban was recalled.

The chief grounds on which this course was adopted, briefly stated, were as follow:—1st, That the Kafirs were justified in engaging in the war by the encroachments made on their territory, and other wrongs inflicted on them by the government and the colonists. 2d, That the war had been conducted in a manner at variance with the principles of humanity. 3d, That the proposed extension of the colonial limits would involve an expenditure for civil and military establishments beyond all proportion to the wealth and number of the inhabitants.

Lord Glenelg, at the same time, laid down rules for future intercourse with the Kafirs, of which the following is the substance:—1st, That the responsibility of villages or kraals for the acts of individuals must no longer be enforced. 2d, That the chiefs alone should be looked to for restitution of stolen property, they being left to detect offenders, or indemnify themselves at the expense of the tribe collectively. 3d, That the killing or wounding a Kafir should be considered in the same light as the like offence committed on Her Majesty's subjects.

This reversal of Sir Benjamin D'Urban's policy, and his recall, together with other causes stated in a former article, led to the emigration from the colony of a large number of Dutch boers to countries beyond the boundaries.

In December 1836 the restoration of the ceded territory took effect, and Mr Stockenström was appointed lieutenant-governor of the eastern frontier, for the purpose of carrying out the policy laid down by Lord Glenelg. Treaties were entered into with the several chiefs, defining their rights and responsibilities.

This policy, however, was distasteful to the mass of the frontier colonists, and Lieutenant-Governor Stockenström was shortly recalled, solely on the ground of his unpopularity, and rewarded with a baronetcy and a pension.

Meanwhile, Sir George Napier had succeeded Sir Benjamin D'Urban as governor-in-chief, and, during his six years term of office, peace was generally maintained. In 1844 Sir Peregrine Maitland became governor, who seems to have seen cause to alter, in some respects, the treaties made by Sir Andries Stockenström. Affairs assumed a very disturbed aspect on the frontiers, and in 1846 another Kafir war commenced.

The immediate cause of this war was an attack, in which a Hottentot was killed, made by a party of natives on a escort which was conveying a Kafir, who had committed a theft, to Graham's Town for trial. There is no doubt the

Kafraria.

Kafraria. Kafirs were eager to find a pretext for war, although the conduct of the colonial authorities on this occasion was not wholly free from blame. The Gaikas were the chief tribe engaged in this, but they were, in the course of it, assisted by the Tambookies. A British force marched into Kafriland, the Amatola Mountains were stormed and taken possession of by a burgher force under Sir Andries Stockenström, who afterwards defeated the Tambookies under Mapassa. The Gaikas again occupied the Amatolas, but at length Macomo surrendered himself, the Kafir who killed the Hottentot was given up, and peace seemed to be restored. On the arrival, however, of Sir Henry Pottinger in 1847, hostilities recommenced, and were carried on with great energy, till at length Sandili, the chief of the Gaikas, surrendered himself as a prisoner. In October 1847, Sir Henry Pottinger was succeeded by Sir Harry Smith, who, after exacting the submission of the chiefs, and proclaiming himself paramount chief of the Kafirs, liberated Sandili. The country was again declared to be under British rule, and a part of the land was disposed of to white settlers. At the same time a machinery of government was established in the country, consisting of a chief commissioner, assisted by subordinate magistrates, and a police force, partly composed of Kafirs, armed with muskets and bayonets.

During the temporary peace which ensued, the convict agitation took place, of which some account is given elsewhere (see CAPE OF GOOD HOPE), but it is referred to here because some persons have, not without reason, in part attributed to it the war of 1850, as the Kafirs may have considered that the divisions which that agitation caused between sections of the population, especially between the Dutch and British, presented a good occasion for renewing hostilities. Another cause of the subsequent outbreak was, we think, the too hasty weakening of the military force on the frontiers after the last war, by sending away several regiments. This measure of false economy was enjoined on the governor by the ministry at home, who, in their turn, were urged by a strong party in Parliament to diminish the military expenditure.

About October 1850 it was reported that the Kafirs, excited by the eloquence of a pretended prophet, named Umlanjeni, were preparing for war. Sir Harry Smith proceeded to the frontier, but refused to believe that an outbreak was at hand, although many signs of the coming storm were observed and pointed out by the authorities and people on the spot. However, he summoned Sandili and the other chiefs to an interview. Sandili refused obedience; upon which, at an assembly of other chiefs, the governor declared him deposed from his chiefship, and appointed an Englishman, Mr Brownlee, a magistrate, to be chief of the Gaika tribe. This measure is said to have been the immediate cause of the ensuing outbreak; but there is no doubt that the Kafirs had already determined on war. On the 24th of December Colonel Mackinnon, being sent with a small force to capture Sandili, was attacked in a narrow defile by a large body of Kafirs, and compelled to retreat with some loss. This was the signal for a general rising of the Gaika tribe. The settlers in the military villages, assembled in fancied security to celebrate Christmas day, were surprised by the treacherous foe, many of them murdered, and their houses given to the flames. Other disasters followed in quick succession. A small patrol of military was cut off to a man. The greater part of the Kafir police deserted, many of them carrying off their arms and accoutrements. Flushed with success, the Kafirs in immense force surrounded and attacked Fort Cox, where the governor was with an inconsiderable force. His situation was truly critical. More than one unsuccessful attempt was made to relieve him; but his dauntless spirit was equal to the occasion. At the head of 150 mounted riflemen, accompanied by Colonel Mackinnon, he dashed out of the fort, and,

through a heavy fire of the enemy, rode to King William's Town,—a distance of 12 miles. Meantime, a new enemy appeared. A large number of the Kat River Hottentots, who had in former wars been our firm allies, rose in rebellion. This revolt was followed by that of the Hottentots at other missionary stations; and part of the Hottentots of the Cape Mounted Rifles followed their example. We have only space to state the general results of the war. After the confusion caused by the sudden outbreak had subsided, and due preparations were made; Sir Harry Smith and his gallant force soon turned the tide of war against the Kafirs. The Amatola Mountains were stormed; the paramount chief Krili, who all along covertly assisted the Gaikas, was invaded and severely punished. In April 1852 Sir Harry Smith left the country in consequence of his recall, and was succeeded by Lieutenant-General the Honourable George Cathcart. The new governor completed the work which his predecessor had so well advanced. Krili was again attacked and reduced to submission. The Amatolas were finally cleared of Kafirs, and small forts erected among them to prevent their reoccupation.

Having subdued British Kafraria, the governor turned his attention to another region. During the war, the Orange River sovereignty had been the scene of anarchy and confusion. Collisions had thus taken place between her Majesty's troops and the Basuto tribe, under the chief Moshesh, caused by the alleged depredation committed by that tribe on the Dutch farmers and another tribe called Bosolongs. At one time matters were in so critical a state in this region that the British resident there wrote the lieutenant-governor of the neighbouring colony of Natal, to send some Zulu Kafirs (as the natives of Natal are called) to his assistance. In a very short space of time the lieutenant-governor raised the required force, which, together with a small party of military under Captain Parish of the 45th regiment, marched in the middle of winter over the Drachenberg Mountains into the sovereignty, the lieutenant-governor accompanying the force to the summit of the mountains, where his jurisdiction terminates.

To punish Moshesh and the Basutos, General Cathcart, with a force of 2500 men, now marched into the sovereignty, and, after some fruitless negotiation with the chief, was attacked by his tribe in overwhelming numbers, all mounted and well armed. The action lasted a whole day, and terminated in a doubtful victory, the loss on the side of the British being thirty-eight men killed and many wounded. The chief Moshesh, however, showed singular forbearance. Feeling, as he said, assured that the partial success which had crowned his arms could be only momentary, and that he never could hope to contend with the British forces, he sent, on the night after the battle, for a missionary residing near him, and had a letter written to the governor suing for peace. The request was granted, and the governor and his force retired. Not long after this event the sovereignty was, as mentioned in the article on the Cape, given up to the Dutch boers. On his return from this expedition, General Cathcart instituted measures for securing the permanent peace of the frontiers. He issued regulations for governing the country under martial law. The mountain part of it, from which the Gaikas had been expelled, was made a royal reserve, in which certain military posts were to be established, to serve as centres of villages to be occupied by colonists on condition of military service. The General considered it necessary to the success of his measures that an adequate regular military force should be kept in the district, until some organized corps of military colonists could be sent to colonize it. General Cathcart left the colony in 1854, and was succeeded by Sir George Grey, K.C.B., late governor of New Zealand, who has given a general outline of the policy he proposes for the government of Kafraria. The chief features of it are, the

Kafrraria.

establishment of institutions for the education of the children and the relief of the sick, and the employment of the Kafirs on the construction of roads to open up the country. He estimated the cost of these measures at L.45,000 per annum, L.40,000 of which is to be provided by the British Parliament for a limited period. Parliament in 1856 made this grant. Sir George Grey has further proposed the introduction of military pensioners from this country. This measure could not be carried out, owing to the unwillingness of the pensioners to go out; but their want is likely to be in some degree supplied by the settlement of the disbanded German Legion in the country.

The Zulu
Kafirs.

We proceed to give some account of these tribes. The Portuguese, in the sixteenth century, found the country from Delagoa Bay to the southward of Natal peopled by Kafirs divided into small tribes. Little is known of them until 1810, when an extraordinary character arose in the country just north of Natal. This was Chaka, son of the chief of a small tribe called Zulus. Owing to accidental circumstances, he was brought up by the chief of a neighbouring and very powerful tribe called the Umtelwas. This chief dying without heirs, Chaka, probably owing to his abilities, succeeded to the chiefship of that tribe, as well as to that of his own. The two tribes, thus united and ruled by a master-spirit, became a powerful nation, and went forth like a consuming fire to spread destruction among other tribes far and wide. Natal was almost depopulated, the majority of the people being annihilated, or incorporated into the conquering host. Some broken tribes took refuge with the Amaxosa Kafirs, by whom they were enslaved, under the derisive name of Amafingu or Fingoes. Chaka formed his warriors into regiments, and established a stern military discipline, which against other natives made him almost invincible. We have seen that he was on the point of attacking the Amaxosa Kafirs, but he desisted from doing so on finding that they were protected by the British government, for which he expressed the greatest respect. He possessed great intelligence, and extraordinary military skill. He was capable of noble and generous acts, but his general conduct was that of a cruel, relentless despot. The wanton massacres committed by his orders almost exceed belief. During his reign a party of British settled in Natal and were kindly treated by him. In 1828 he was murdered, at the instigation of his brother Dingaan, who succeeded him. Dingaan imitated the bloody acts of his brother, without possessing his ability or generosity. Towards the end of 1837 a part of the Dutch boers who, as we noticed in our article on the Cape, left the colony in 1836, found their way to Natal. One Retief, their leader, and about sixty-five followers, sought an interview with Dingaan, by whom they were barbarously murdered in cold blood. A bloody war then ensued between the boers and Dingaan, in the course of which the latter, at the head of a force 14,000 strong, was signally defeated with great loss by a party of 860 boers. During these hostilities, the governor of the Cape sent to Natal a small detachment of troops to try to prevent further bloodshed, but, being found useless for such object, it was soon withdrawn. A brother of Dingaan, named Panda, now joined the boers, with a large section of the natives. The combined force completely routed Dingaan, who fled to the neighbourhood of Delagoa Bay, where he was murdered by a tribe with whom he had taken refuge. The boers proclaimed Panda chief of the Zulus. In 1842 Natal was taken possession of by the British government after some severe fighting with the boers, and in 1845 it was created a separate government under a lieutenant-governor and other officials. As Panda's rule was nearly as cruel as that of his brothers, numbers of his subjects, chiefly those who had been subdued by Chaka, fled into Natal for protection. These refugees, very few of whom belong to the Zulu tribe, form the greater part of the black

population of Natal. Panda continues to rule over the country lying between Natal and Delagoa Bay, commonly called the Zulu country, and his power is still very formidable; but, owing to his fear of the Dutch boers beyond our jurisdiction, and other causes, he has hitherto remained on friendly terms with the British authorities.

Kafrraria.

In regard to form and appearance there is a slight difference between some of the tribes inhabiting so vast a tract of country. They may, however, be described generally as tall and well-formed; having regular features and well-developed foreheads; with skins varying from black to copper colour, and crisped woolly hair like that of the negro, only growing in small detached tufts. The Amaxosa are lighter in the skin, taller, and with an expression of countenance more fierce and haughty than the Natal and Zulu Kafirs and the kindred Fingoes.

Character,
of the
Kafirs.

The Kafirs generally are acute and subtle, with the usual faults of savages, duplicity and cruelty. They have, however, redeeming traits; for they are faithful when trusted, and not incapable of gratitude. Polygamy prevails universally—wives are purchased with cattle, and are compelled to work for their husbands, who pass their time in indolence, except when engaged in the exciting pursuits of the chase or war. A Kafir cannot marry a blood relation, but he may marry the widow of a deceased brother. As children, especially daughters, are valuable, instances are not unknown of old or impotent men giving out their wives to younger men, reserving his right to the children procreated. The clothing of the Kafirs consists of a cloak made of skins, or, latterly of a blanket. They wear armlets and necklaces made of animals' teeth or beads. They are also fond of wearing brass rings on their arms. Their war dress is more elaborate, consisting of kilts of skins, and head-dresses of feathers of various kinds. Their weapons are the assegai,—a kind of spear,—one kind of it being short, with a broad blade about 12 to 18 inches long, for stabbing; the other longer in the shaft, with a narrow blade about 9 inches long, for throwing. They carry large shields made of hides. They have latterly acquired firearms, and use them with some skill.

Their chief property is cattle, and the laws regulating its succession are very complicated, in consequence of polygamy, and producing much litigation. In general the eldest son of the chief wife succeeds to the chiefship. The government of the tribe resides in the chief, assisted by his head men or councillors. Many crimes are punished with death, especially such as affect the sovereignty of the chief; others, and among them, in some cases, murder, are punished with fine or confiscation of property.

In their savage state the Kafirs have little sense of religion. They believe in a Being who made the world; but that now, if not extinct, he takes no heed of its government. They conceive that the spirits of their forefathers exercise an influence over them, and they have a strong belief in witchcraft. The witch-doctor, who professes to discover wizards and witches, plays a prominent part in their social and political system. He is the ready instrument of oppression in the hands of the chief, who, whenever he dislikes or fears any of his subjects or covets their property, employs the "doctor" to accuse them of witchcraft, for which they are killed, and their cattle is seized by the chief. They practise circumcision, eschew pork as food, and have other customs similar to those of the Jews, from whom, some have supposed, they were borrowed; but similarity of climate, and other external circumstances, will produce similar habits in men. The Kafirs also abstain from eating fish, fowls, or eggs. They cultivate Indian corn, pumpkins, and a kind of millet. They chiefly live upon these articles and milk, eating little meat except in war time, when they freely kill their cattle. Their language is singularly soft and harmonious. Its structure is very peculiar and complicated. Its chief characteristic is, that the relation between words is

Kafiristan expressed by prefixes; those of the nouns and pronouns regulating those of the verbs and other parts of the sentence. The language has been reduced to writing, grammars formed of it, and the New Testament has been translated into it. The best grammars are those of Appleyard and Boyce of the Amaxosa Kafir. There is only one small grammar written in English of the Zulu Kafir—that by Dr Collenso, the bishop of Natal. It is, however, chiefly taken from the work of a Norwegian missionary, written in Danish.

It is almost impossible to form anything like a correct estimate of the Kafir population. We should think the Amaxosa, in all its branches, numbers not less than 200,000 souls. The Amatémbu, or Tambookies, may be about 70,000. The Amaconda and their neighbours about 90,000. The Kafirs of Natal are estimated at 100,000. The population of the Zulu and other Kafir countries it is impossible to estimate. (B. C. P.)

KAFIRISTAN, in Asia, a country adjoining the N.E. boundary of Afghanistan, and remarkable because, though surrounded by powerful and implacable enemies, it has never been conquered. The name Kafiristan, signifying "land of infidelity," has been given to the country by the neighbouring Mussulmans, in consequence of the rejection of Mohammedanism by the inhabitants. They are called Siyah Posh, or "black clad," from wearing black goat-skin dresses. The country is drained by four considerable rivers, the Kamar, Alingar, Alishang, and Tagoa, which fall into the River Kabool. It is situate between N. Lat. 35. 36, and E. Long. 70. 74.

KAIRA, in Hindustan, the principal town of the British collectorate of the same name, situate within the Presidency of Bombay, near the confluence of two small rivers, the Watruk and Seree. It is of considerable size, and surrounded by a wall with bastions. The streets are uneven and narrow, but the houses are substantial and lofty, with sloping tiled roofs, and a good deal of carving about the woodwork of their gables and verandahs. The district of which this place is the chief town has an area of 1869 square miles, with a population of 580,631 persons, inhabiting 138,958 houses. The tract was ceded to the East India Company by the Guicowar, under different treaties and engagements, commencing with the grant of the fort of Kaira, which was made over to the British in May 1803. The town of Kaira is distant from Bombay N. 265 miles. Lat. 22. 45., Long. 72. 41

KAIRWAN, a large town of Northern Africa, regency of Tunis, and about 80 miles S.S.E. of the city of that name. In extent and importance it ranks as the second city of Tunis, and by Mohammedans is regarded as the holy city of Africa. The great mosque, supported, it is said, by 500 marble or granite pillars, is esteemed the most magnificent, as well as the most sacred, in Barbary. Kairwan was founded by the Arabs about A.D. 670. It stands in a barren, sandy plain, and is surrounded by a low wall having four gates. The houses are generally good, and the streets wide, but there is a great deficiency of water. Yellow Morocco boots and slippers made here are famous for the beauty of their dye. Pop. about 50,000.

KAISARIYEH or **KAISARIAH** (anciently *Mazaca* and *Cæsarea*), an important commercial city of Asia Minor, pashalic of Caramania, situate in a plain at the N. foot of the Erjish Dagh (the ancient *Argæus*), 150 miles E.N.E. of Konieh. It is the entrepôt for a large extent of country, and the resort of merchants from all parts of Asia Minor and Syria. Besides cotton, gums, fruit, wine, furs, skins, wool, goats' hair, and the other products of its own territory, it trades in numerous articles of British and colonial produce, hardware, silks, woollens, indigo, dye-woods, &c. The chief articles of industry are cotton-thread and cloth, and yellow Morocco leather. The vicinity is fertile, and

the climate salubrious, but Kaisariyeh itself is the filthiest town in all Turkey. The streets are narrow and irregular, and the houses, though solidly built of stone and brick, have a mean and dilapidated appearance. Mazaca was the capital of Cappadocia, and when that kingdom became a Roman province in the reign of Tiberius, the name of Mazaca was changed to Cæsarea. In the later times of the empire it became a city of great importance, and is said to have had a population of 400,000 persons. The present population is variously estimated at from 8000 to 25,000.

KAISERSLAUTERN, a town in the Bavarian circle of the Palatinate, and capital of a cognominal district, stands on the Lauter, 34 miles W.N.W. of Spires. It was fortified as early as the middle of the twelfth century by the Emperor Friedrich Barbarossa, who also built the strong castle which was destroyed by the French in the war of the succession. Three engagements took place here in 1793–94, between the French and Germans, in which the latter gained some advantages. The town has manufactures of linen and woollen goods, leather, and paper; but is chiefly dependant upon its iron-works, which are supplied from mines in the vicinity. Pop. about 7000.

KALAMAIKA, a favourite Hungarian dance of a lively kind, in 3/4th time, consisting of two strains, each of four bars, and each repeated.

KALBE, a town on the River Saala, in the Prussian province of Saxony, and government of Magdeburg, 18 miles S. of the town of that name. It is noted for its manufactures of friezes, flannels, and hosiery. Pop. 5903.

KALEIDOSCOPE (*Kalós, beautiful, eidos, a form, and σκοπέω, I see*), an optical instrument, which, by means of two equal plane mirrors inclined to each other at a certain angle, and placed in a particular manner relative to the eye and object, is used, as its name imports, to produce and to exhibit beautiful forms. It was invented in 1814 by Sir David Brewster while experimenting on the polarization of light; and ere the inventor had time to secure it by patent unprincipled opticians made kaleidoscopes by thousands, and sent them to all parts of the world. Sir David Brewster states that no fewer than 200,000 of these instruments were sold in London and Paris in the space of three months; and yet, he says, that out of this immense number, there are, perhaps, not one thousand constructed upon scientific principles, or capable of giving anything like a correct idea of the power of the kaleidoscope; and of the millions who have witnessed its effects, there are perhaps not one hundred who have any idea of the principles upon which it is constructed, and of the mode in which its effects are produced.

In order to produce its effects, the instrument may be said to depend on the principle of a repetition of the reflections of an object situate between

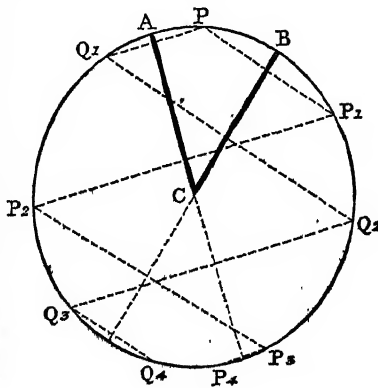


Fig. 1.

two plane mirrors inclined to each other at a certain angle; or, more particularly, if two reflecting planes form a section with each other, then the reflections of an object between the planes will all be found in the circumference of a circle, the centre of which is the projection of the intersection of the planes, and the number of images will be such as will exactly complete the circle. This will be more easily understood from fig. 1, where AC

Kafiristan
||
Kaisariyeh.

Kaiserslautern
||
Kaleidoscope.

Kaleidoscope.

BC, are the orthogonal projections of two plane mirrors, C the projection of their line of junction, and P the position of a luminous point or object within the angle ABC, made by the reflecting planes; then from centre C and radius equal to CP, describe a circle AB. It is clear that we shall have two series of virtual images which will be all ranged round the circumference of the circle AB; for the rays of light, and, therefore, a perpendicular ray from P, regarded as a luminous point, will have a virtual image P_1 , an image of itself on the other side of the plane BC, and as far distant from that mirror as P is. But the bright image P_1 , letting a perpendicular ray fall on the mirror AC, has a virtual image P_2 as far distant from AC as P_1 is; P_2 is also a luminous point, and has its image at P_3 in the mirror BC *produced*, and at the same distance from it as its focus P_2 ; the last repeated reflection of P is caused by the bright point P_3 being seen at P_4 , its virtual image behind and as far from the mirror AC *produced* as P_3 . If we make a similar construction for a ray of light emanating from the focus P upon the mirror AC, the virtual image of P will be Q_1 , which will also produce Q_2 as its image, and so on, till at last we arrive at Q_4 . Now, since the bright images P_4 and Q_4 are at the *back* of both reflecting planes produced, they can suffer no reflection; therefore, the repeated reflections of P in the two mirrors are P_1, P_2, P_3, P_4 and Q_1, Q_2, Q_3, Q_4 , and they are, by Euclid 3. III., points in the circumference. Now, since these points are the respective foci of these perpendicular rays, they will also be the foci of all the rays diverging from their respective points, and, therefore, will form perfect images of the object between the mirrors.

Suppose, now, that instead of having the mirrors perpendicular to the plane of the paper (fig. 2) they have an inclina-

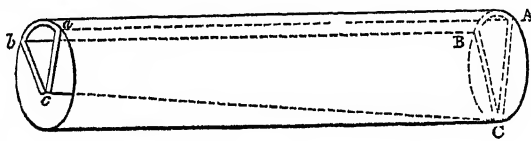


Fig. 2.

tion to each other, and have on the inner edges of AC, BC, one or both, small bits of vari-coloured glass; and if the system of mirrors be inclosed in a case blackened on the inside, then an eye placed at c will see a gorgeous and symmetrical pattern or picture. If the instrument be turned to different parts of the room, the pieces of glass remaining as before, the light will fall on the other portions of the coloured glass, and consequently produce a different pattern. This was the first kind of kaleidoscope which Sir D. Brewster made. It occurred to him some time afterwards, that the pattern might be varied by a motion or change of position in the objects reflected by the mirrors; the coloured glass or other objects were therefore placed between two plates of very thin glass, which formed, as it were, an object-glass; and being held in the hand, could be moved about at pleasure. The kaleidoscope was still further improved by making the object-plates circular, while a motion took place round the axis of the tube, or by sliding the object-plate in a groove, the object being placed in a cell of the reflectors.

The principal parts of the kaleidoscope, then, are the two mirrors (fig. 2) ACca, BCcb; which should be from 6 to 10 inches in length, and from 1 to 1½ inches broad at the end ABC, but about half this breadth at the end abc. These mirrors are kept apart at their upper, and united along their lower edges Cc, so as to form the solid angle

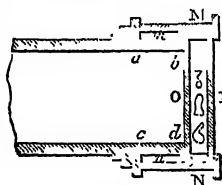


Fig. 3.

ACcb, and which must be some measure of 4 right angles, or 180°. The planes, which must always be free from dust, are placed in a tube, as in fig. 3; but the end ab is covered, and a small eye-piece affixed, so that the eye may take in the field of view ACB. It is of importance to have the angle of the mirrors as accurate as possible, for any deviation from the even angle will be immediately perceived by the eye. If the angle be a little larger than it should be, the image is deficient, and in some parts irregular or non-symmetrical; if the angle be a little smaller than it should be, the image is redundant, from a reduplication of one part. Sometimes portions of the images overlap and interfere with each other; but on the angle of the mirrors being rectified, these double images coalesce and form one image perfectly symmetrical in all its parts. The angles, therefore, which the mirrors of a kaleidoscope must make with each other are such as the following:— $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{8}, \frac{1}{10}, \frac{1}{12}, \frac{1}{15}, \frac{1}{18}, \frac{1}{20}, \frac{1}{24}, \frac{1}{30}, \frac{1}{36}, \frac{1}{40}, \frac{1}{45}, \frac{1}{48}, \frac{1}{60}, \frac{1}{72}, \frac{1}{80}, \frac{1}{90}, \frac{1}{100}, \frac{1}{120}, \frac{1}{144}, \frac{1}{160}, \frac{1}{180}$, &c., of 180°; or 90°, 60°, 45°, 36°, 30°, 18°, 15°, 12°, 10°, 9°, &c. Whatever part, therefore, the angle ACB is of 180°, the same will be the number of times the image is reflected or repeated in the mirrors. If, in fig. 1, ACB were an aliquot part of 180°, then the images P_4, Q_4 would form a single image; but when this is not the case, a want of symmetry will be perceived. It is important also that the line of junction cC of the mirrors (fig. 2) be of the finest possible kind and free from chips, for, otherwise, an imperfection will take place in the image. The planes, which have been previously blackened on the back, may be kept together at the proper angle by means of a piece of cloth glued on to their non-reflecting surface, so that they may fold in and out like the leaves of a book. By this contrivance the mirrors may be adjusted to the proper inclination, but chiefly by directing them to any line, or the straight edge of any object in contact with the broad ends, and very obliquely situate with respect to the edge of either of the mirrors; then looking through the instrument at one end, if the image be symmetrical with respect to its pattern, we may be sure that the planes are accurately inclined. The mirrors are now to be carefully set in the hollow tube which is to receive them; and the arrangement of a piece of cork or wood (c. g.) at the back of the mirrors must be such that the angle of inclination will remain unaltered. The remaining side ABda of the hollow prism made by the planes (fig. 2) may be effectually closed up by a piece of black velvet glued to the back part of the mirrors. The object-case of the instrument at the farther end from the eye is made up of two pieces of thin glass, kept separate by a brass rim about $\frac{1}{4}$ th or $\frac{1}{6}$ th of an inch broad; the intervening hollow part contains the objects which are to be reflected. This case is seen in fig. 3, and at the wide end of the mirrors to which it is to be affixed. The end ABC of the planes (fig. 2) is in fig. 3 represented by abcd; mn is a brass ring, which moves easily upon the tube, and rests steadily in its place; MN is a brass cell, slipping tightly on the moveable ring mn. The objects are placed in a case, one of the glasses of which is transparent, and the other ground; the brass rim separating them should consist of two pieces, the one screwing into the other, so that the objects in the case might be unscrewed and changed at pleasure. The object-box is placed at the bottom of the cell MN, as at OP; and the depth of the cell is such as to allow the side O to touch the end of the mirrors when the cell is slipped upon the ring mn. It is an essential condition that the objects be as near as possible to the plane ABC of the mirrors. The objects employed for reflection are various; but generally small pieces of transparent coloured glass, occupying a certain portion of the interval between the mirrors, produce at times the most splendid patterns. Wires of glass also, both spun and twisted, different in colour and form, may be intermixed with larger masses of coloured glass, beads, bugles, fine needles, metallic wires,

Kaleidoscope.

Kaleido-
scope.

lace, seaweed, looped figures and letters (as 8 and S), circles, ovals, spirals, triangular lines, varnish, indurated Canada balsam, &c.; the case, however, must not be too crowded with objects, so as to interfere with each other's motion.

The patterns produced are of the most gorgeous description, and sometimes defy imitation; the pictures of the images are best comprehended by looking into the instrument itself. When objects are to be looked at which are not in the case, they must be held as near as possible to the object end; such objects are generally viewed as through a microscope, the light falling very strongly upon the object.

The simple kaleidoscope has, as we have seen, two mirrors, but on the same principles as above, we may construct one with 3, 4, 5, &c., or any number of reflecting planes, and which will repeat images in endless succession on every side. Such optical instruments are termed *Polycentral Kaleidoscopes*. But where symmetry and regularity of form are required, the polycentral kaleidoscope is confined within narrow bounds; for the angles of the several reflecting planes with each other must be an aliquot part of 180° . Thus, if the kaleidoscope have three mirrors, the angles, in order that a perfect image may be produced by each angle of the prism, must be 60° , 60° , 60° ; or 45° , 45° , 90° ; or 30° , 60° , 90° . When the reflecting planes are equilateral, and, therefore, have each side making an angle of 60° with each other, the instrument is termed the *Triangular Kaleidoscope*, from the triangular symmetry which the images present, the images of each plane being combined in groups of three together in every part of the pattern. When we have an isosceles right angled triangular prism, and, consequently, with angles of 45° , 45° , 90° , the pattern produced is regularly divided into square compartments, and therefore this disposition of the mirrors has received the name of *Tetrascope*. When the polycentral kaleidoscope has its angles of 30° , 60° , 90° , the pattern produced is hexagonal, and the symmetry is very conspicuous, especially with reference to that centre round which are congregated the greatest number of repetitions caused by the angle of 30° . This disposition of the reflecting mirrors is termed a *Hexascope*. Of these the last two kaleidoscopes are of use to the draughtsman, in affording him the best material for his designs.

The principal advantage which the polycentral has over the simple kaleidoscope is, that the former has a greater field of view than the latter. Were no loss of light to arise from repeated reflections, the field of view would be infinite; but since each reflected ray is not so intense as its corresponding incident one, a diminution of light takes place from repeated reflections. The effects of polarization also increase the loss, but more from this cause in the polycentral than in the simple kaleidoscope; hence metallic specula are preferred to the best of glass mirrors. The number of reflections required, in order to obtain any great extent of *spectrum*, that is, the whole appearance in the kaleidoscope, being greater than in the ordinary kinds of simple kaleidoscopes, the instrument must be of greater length comparatively with the breadth of the mirrors, as in this way the course of the rays will be more oblique with respect to the mirrors, and a larger portion of light will reach the eye. A greater obliquity is also obtained with the same proportion between the length and breadth of the mirrors, by making them taper at the end next the eye.

We may add, also, that of four-sided kaleidoscopes, those which can give perfectly symmetrical forms are the square and rectangle, where all the angles are right angles.

We may repeat here the conditions necessary for the kaleidoscope producing perfectly symmetrical images. 1st, The angle of inclination of the mirrors must be an *even* or *odd* aliquot part of 180° , or 360° , when the object is regular and similarly situate with respect to both of the mirrors; or an even aliquot part of 180° or 360° , when the object is

irregular. 2d, That out of an infinite number of positions for the object, both within and without the reflectors, there is only one position where perfect symmetry can be obtained, viz., by placing the object in *contact* with the ends of the reflectors, or between them. 3d, That out of an infinity of positions for the *situation of the eye* there is only one where the symmetry is perfect, viz., as near as possible to the angular point, so that the whole of the circular field can be distinctly seen; and this point is the only one at which the uniformity of the reflected light is the greatest. When these conditions are properly attended to, the pictures produced in the field of view are beautiful beyond description, and present an endless variety of symmetrical combinations, never recurring a second time when the objects have been displaced by a slight vibration, or by turning the instrument on its axis.

In order to extend the power of the instrument, and to introduce into symmetrical pictures external objects, whether animate or inanimate, Sir David Brewster very ingeniously substituted a double convex lens L (fig. 4), for

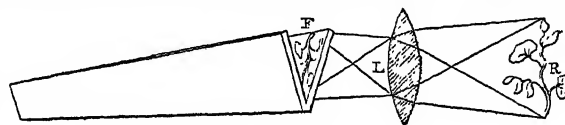


Fig. 4.

the case of objects between the circular glass plates, by means of which the second condition for symmetry in kaleidoscopes can be fulfilled. This lens L formed at F between the mirrors an inverted image of the object R; and this image is multiplied by the reflecting planes, and forms a symmetrical spectrum precisely in the same way as if a real object of that size had occupied its place. The lens L may be placed in or at the mouth of one tube, while the reflecting planes are accurately placed in another, so that by pulling in or pushing out the tube next the eye, the images of objects at any distance can be formed at the place of symmetry. Thus may flowers, trees, animals, pictures, busts, &c., be introduced into symmetrical combinations. A blazing fire gives the appearance of beautiful fireworks. Such a disposition of the mirrors and the lens is a *Telescopical*, or *Compound Kaleidoscope*. If the distance of F from the eye-piece be less than that at which the eye sees objects distinctly, a convex lens must be placed before the eye, so as to give distinct vision of the objects in the picture.

The images produced by the kaleidoscope may be exhibited to an assembly of spectators at the same time by placing the flame of a lamp between a spherical reflector and a convex-plane lens, the latter of which concentrates the rays, and, being next the instrument, throws a flood of light upon the object-case; the picture is projected on the opposite wall through a double convex lens placed at the eye end. The lamp may be replaced by a jet of oxygen.

The beautiful designs produced by this simple instrument may be copied by means of the *Camera obscura*, but more successfully traced by using a *Camera lucida*.

Instead of employing reflecting surfaces, Sir David Brewster tried the effect of solid prisms of glass, and obtained in this way a total, instead of a partial, reflection of light. It is difficult, however, even to make these prisms free from veins or bubbles, and also to obtain a perfect junction of the planes.

Simple kaleidoscopes have been variously constructed, with reference to the angles of inclination of the mirrors, Brewster's *Polyangular Kaleidoscopes* are so constructed that the angle of the mirrors may be varied at pleasure, by allowing the reflecting surfaces to move on their connecting edges as on a hinge, and thus to open or close at pleasure by means of a screw. Others, again, admit of the mirrors entirely separating, so as gradually to become parallel to

Kaleido-
scope.

Kalends
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Kama.

each other. (Sir David Brewster's *Treatise on the Kaleidoscope*, Edin., 1819; Harris's *Treatise on Optics*; Wood's *Optics*; Dr Rogel "On the Kaleidoscope," *Annals of Philosophy*, vol. xi., p. 375; *Compte Rendu des Travaux de l'Académie de Dijon*, 1818, pp. 108-117; and Brewster's *Treatise on Optics*, 1853.)

KALENDS. See CALENDAR.

KALISZ, or KALISCH, a city of Russian Poland, capital of a province of the same name, situate on an island in the Prosna, close to the Russian frontier, and 130 miles W. by S. of Warsaw. It is surrounded by old walls, flanked with towers, and entered by five gates. Kalisz is considered one of the finest cities of Poland; its streets are wide and well paved, and the houses are generally good. Among its public buildings are the citadel, founded by Cassimir the Great, the former palace of the Voivodes, now occupied by the courts of justice, the cathedral, church of St Nicholas, and the Lutheran church. There are six Roman Catholic churches, five convents, a Jewish synagogue, theatre, several hospitals, Roman Catholic gymnasium, with fine library, and extensive scientific collections, and a military school. Kalisz was founded about the middle of the seventh century, and was long the residence of the dukes of Great Poland. Pop. (1854) 11,778.

KALLEENJUR. See CALLINGER.

KALOCSA, or KOLOCSA, a town of Hungary, near the left bank of the Danube, 67 miles S. of Pesth. It is the see of an archbishop, and has an ecclesiastical lyceum, piarist college, gymnasium, and an old castle, now the archiepiscopal palace, containing a fine library of upwards of 30,000 volumes. Pop. (1851) 11,000.

KALUGA, a government of European Russia, bounded W. and N.W. by Smolensk, N.E. by Moscow, E. by Tula, and S. by Orel, and lying between N. Lat. 53. 20. and 55. 20., and E. Long. 33. 20. and 37. Area 12,178 square miles. The surface is an almost uninterrupted flat, and the soil is usually of a sandy, or hard clayey nature, requiring a large quantity of manure to render it moderately fertile. About two-fifths of the government are arable, and more than one-half of it is covered with forests. It is well watered with numerous rivers and streams, the principal of which are the Oka and its tributaries. There are also several lakes and marshes in the central and western parts of the government. The climate is considered mild for Russia; winter usually sets in about the end of November, and disappears by March. The principal crop is rye, but oats, wheat, and barley are also largely grown, as well as hemp and flax. Cattle are not numerous, but a considerable number of horses are bred. Neither game nor fish are abundant. The mineral products are bog iron-ore, millstones, lime, and gypsum. This government being naturally unsuitable for agriculture, the attention of its inhabitants has been chiefly directed to the manufactures, and in this respect Kaluga ranks immediately after Moscow and Vladimir. The chief manufactures are iron, brandy, sail-cloth, linens, woollens, calicoes, silk-velvet, ribands, leather, paper, and glass. Pop. (1851) 941,402.

KALUGA, the capital of the above government, is situate on the right bank of the Oka, 95 miles S.W. of Moscow. Though consisting of not more than 4000 houses, it is said to be nearly 7 miles in circumference. It is surrounded by a rampart, which has been formed into a public walk. The houses are chiefly wooden, and the streets narrow, crooked, and dirty. There are, however, some good public edifices,—as the government-house, town-hall, theatre, and several of the churches. Besides carrying on an extensive trade, it manufactures largely sail-cloth, woollens, cottons, leather, sugar, hats, &c. Pop. (1851) 29,580.

KAMA, a large river of European Russia, the principal affluent of the Volga. It rises in the government of Viatka, N.E. of Glazov, flows first N. and then N.E. into the go-

vernment of Perm, where it takes a S.W. direction; it afterwards separates the government of Viatka from those of Perm and Orenburg, and, entering Kasan, joins the Volga, after a course of more than 100 miles. One of its affluents is connected with an affluent of the Dwina by a canal 12 miles in length, thus establishing water communication between the White Sea and the Caspian.

KAMINIETZ, or KAMENEZ, a town of Russian Poland, capital of the government of Podolia, on the Smotritza, at a short distance from its junction with the Dniester. It was formerly the strongest bulwark of Poland on the side of Turkey. Its walls were levelled by order of the Russian government in 1812, and it is now defended by a citadel and a detached fort. The streets are narrow, crooked, and dirty, and the houses are generally of wood. There are, however, some handsome public buildings, among which are the two cathedrals and several of the churches and the government offices. Kaminietz is the seat of a Greek archbishop, and of a Roman Catholic bishop. It has some manufactures, and a considerable trade. Pop. (1851) 17,109, one-half of whom are Jews.

KAMISHIN, or KAMYSCHIN, a walled town of Russia, government of Saratov, on the Volga, at its junction with the Kamyschinka, which flows through the town. It has large salt magazines, water-mills, and tallow factories; and carries on a considerable trade in agricultural produce. Pop. (1851) 7651.

KAMTSCHATKA, a large peninsula of Asia, projecting from its N.E. coast in a southern direction for about 800 miles from N. Lat. 62. to 51., and between E. Long. 155. and 165. It forms part of Russian Siberia, and is bounded on the N. by the country of the Tchuktchi, E. by the Sea of Kamtschatka, S. by the North Pacific Ocean, and W. by the Sea of Okhotsk. From Cape Lopatka, its southern extremity, it gradually increases in breadth to the middle, where it is about 250 miles across; and N. of this its breadth averages from 80 to 150 miles. A chain of lofty and rugged mountains traverse the peninsula from N. to S. through its entire length. Many of the peaks are active volcanoes, and they are considered to form the northern extremity of a great volcanic chain continued through the Kurile and Japanese islands and the Philippines. On the eastern side the mountains approach close to the coast, which is rocky and precipitous, with numerous bold promontories and inlets. The western coast is low and sandy, with no elevations for 25 or 30 miles inland. The principal elevations, proceeding from S. to N., are Awatchinskaja, 8760 feet above the sea; Korjaskaja, 11,215; Japanowa, 9060; Kronolzkaja, 10,625; Kliutschewskaja, 16,512; and Schiwelutschkaja, 10,590. The general formation of Kamtschatka is igneous; comprising porphyry, jasper, trap, granite, &c; the W. side, however, belongs to the secondary and tertiary formations. The only river of importance is the Kamtschatka, which is said to be 300 miles in length, and to be navigable for vessels of 100 tons for 150 miles.

The climate is very severe, but is much milder than that of Eastern Siberia. Winter continues for seven or eight months in the year. Spring is the finest season, the summer being extremely disagreeable owing to the frequent rains and heavy fogs which settle on the land. The greatest heat is in July. The frost begins to set in about October, and usually continues till May. In the middle of winter the temperature averages about 14° Fabr.; but in severe frosts it sometimes falls as low as -15°, or even lower. From the severe and variable nature of the climate, and the rocky nature of the country, the vegetable productions are of little value. Forests of considerable extent occur, consisting of several species of birch, pine, poplar, and willow; but these are all stunted in their size. Shrubs are plentiful, and so are wild berries and wild garlic. In some few favoured

Kaminietz
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Kamtschatka

Kanawha spots the Russian settlers succeed in raising wheat, barley, rye, oats, potatoes, turnips, radishes, &c. The wild animals, which were formerly very abundant, have been much thinned by the hunters. They comprise bears, wolves, foxes, reindeer, mountain sheep, beavers, and otters. Wild fowl are still plentiful; but it is on fish, which abound everywhere, that the inhabitants chiefly depend for subsistence. The dogs of Kamtschatka are much valued, and are trained to perform many useful operations. The trade of the country is very limited. There is no equitable system of taxation, and the Russian governors, at such a distance from the capital, have few checks on their cupidity. The people thus labour only to supply their daily wants. Furs and dried fish are exported from Petropaulowsky; the imports are rice, flour, coffee, sugar, brandy, and whisky.

The natives of Kamtschatka consist of two tribes,—the Kamtschatdales and Koriaks, who differ from each other more in mode of life than in physical conformation. They are in general of low stature, with broad shoulders, a large head, and short legs. They have scarcely any beard, their face is long and flat, eyes small and sunken, lips thin, and hair lank and black. Their features seem to identify them with the Mongolian race. They are mild and hospitable, but at the same time filthy, lazy, and sensual in the extreme. Notwithstanding the severity of the climate, they are subject to few maladies, and generally reach an advanced age.

The Kamtschatdales occupy the southern part of the peninsula to about 58° of N. Lat.; while the country N. of that is occupied by the Koriaks. The former have fixed habitations, and employ themselves in fishing and hunting. During the summer or fishing season they leave their winter residences for the places which they use for drying fish. The summer is thus occupied in providing food for the winter, in which their only employment is the chase. Their winter habitations are sunk some feet under the ground for the sake of warmth, the walls formed of trees laid over each other and plastered with clay, and the roof slanting, and covered with coarse grass or rushes. The summer house is raised to the height of 12 or 13 feet from the ground by means of posts, in order to afford them a sheltered space to dry their fish. The Koriaks are a wandering, nomadic tribe, subsisting on the produce of their numerous herds of reindeer. The whole population of the peninsula is said not to exceed 5000, of whom about one-third are Russian settlers or their descendants.

Kamtschatka was first visited, in 1649, by some Russians, who were wrecked on the coast. They lived in peace with the natives for some time, but afterwards, quarrelling among themselves, were all murdered. It was not till 1696 that a body of Cossacks from Anadirsk penetrated into the country; and from that time a series of hostilities were maintained against the natives till 1706, when they were completely subjected to Russia.

KANAWHA, a river of the United States of North America, rising in the N. of North Carolina, and flowing in a N.N.W. direction through Virginia to its mouth in the Ohio, at Point Pleasant, 252 miles below Pittsburg. It is about 300 miles in length, and is navigable for steamers to Charleston, 60 miles from its mouth.

KANDAHAR. See **CANDAHAR**.

KANDY, a city of Ceylon, near the centre of the island, and about 65 miles E.N.E. of Colombo. It was the capital of the kings of Kandy till 1815, when it came into the possession of the English. The town stands on the margin of an artificial lake, and is almost surrounded by an amphitheatre of steep and lofty hills. Since 1815 many good buildings have been erected, and several streets formed; but the ordinary dwellings are mere mud huts. The royal palace, once a building of great magnificence, has been in a great measure allowed to fall into decay. See **CEYLON**.

KANGAROO ISLAND, a large island of South Australia, at the mouth of the Gulf of St Vincent, in S. Lat. 36., E. Long. 137. It is 95 miles in length from E. to W., and, with the exception of a narrow portion at its eastern end, is about 25 miles wide. Area estimated at 1970 square miles. The surface is for the most part covered with brushwood, with here and there clumps of trees. It contains numerous salt lakes. It was discovered by Capt. Flinders, and received its name from the number of kangaroos found on it.

KANGRAH, an extensive hill fort of the Punjab, situated to the S.W. of the Himalaya Mountains, between the Beyah and the Rauvy rivers. The country is covered with wood. The fortress, which is situated in the northern part of the province, has long been celebrated. It was taken, A.D. 1010, by the famous Mahmoud of Ghizni, who plundered it of immense riches. It was retaken by the rajah of Delhi in 1043; and afterwards by the Emperor Akbar, after a very long siege, who conferred it on one of his officers, with the adjoining district. About the beginning of the present century it belonged to Sansa Chand, who ultimately surrendered it to Runjeet Singh. When the Punjab became a British possession, the vicinity of Kangrah was selected as one of the localities for the culture of the tea tree. The experiment was eminently successful, and an extensive plantation now covers the base of the Chumba range of hills. The fort of Kangrah is in Lat. 32. 5., Long. 76. 18.

KANO, a town of Houssa, Central Africa. See **HOUSSA**.

KANOGE, a town and district of Hindustan, in the province of Furruckabad. The district extends along the E. side of the Ganges, and is generally of a sandy soil, though well cultivated. The town is of great antiquity and celebrity, about 2 miles distant from the Ganges, with which it communicates by a canal. It was in former times of much greater extent and magnificence; and for an extent of about 6 miles the small pieces of brick which are seen on the spot, and the occasional traces of building, mark out the site of the ancient capital of Hindustan. The town at present consists of but one street; there are no buildings of any consequence; and the brick walls, which appear of no great antiquity, are going rapidly to decay. The adjacent plain is covered with ruined temples and tombs, and everywhere broken images are seen lying under the trees. The most curious remains of antiquity are often found amongst the ruins, such as ancient coins inscribed with Sanscrit characters, and sometimes with the figure of a Hindu deity on one side. Kanoge was the capital of a powerful empire which existed at the period of the Mohamadan invasion. It was conquered, though not permanently retained, by Mahmoud of Ghizni, A.D. 1018. The distance from Agra is 110 miles; from Lucknow, 75; from Delhi, 214; and from Calcutta, 650. N. Lat. 27. 5., E. Long. 79. 59.

KANSAS, a territory of the United States of North America, lying between N. Lat. 37. and 40., and W. Long. 94. 25. and 107. 20., and bounded on the N. by the territory of Nebraska, E. by the state of Missouri, S. by the Indian and New Mexico territories, and W. by the main chain of the Rocky Mountains which separates it from the territory of Utah. Kansas may be said to constitute the territorial centre of the vast continent of North America, being about equally distant from the Atlantic on the E. and the Pacific on the W., from Hudson's Bay on the N. and the Gulf of Mexico on the S. It is about 800 miles in length from E. to W., by 208 in breadth from N. to S., and has an estimated area of 114,798 square miles. The surface of the country presents a gradual inclination from the base of the Rocky Mountains to the frontier of Missouri. It has no mountains, properly so called, except on its western borders. A series of hills or ridge-like elevations traverse the entire territory from

Kangaroo
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Kansas.

Kansas.

W. to E. between the waters of the Kansas and Arkansas. The eastern portion of Kansas, extending W. from the Missouri about 200 miles, consists of an undulating country, with a rich and fertile soil, well watered, and having a large amount of good timber. The streams flow through fine picturesque valleys, and are generally bordered with timber for a quarter or half a mile. The face of this part of the country, with its climate, soil, and productions, corresponds generally with that of Western Missouri. The middle portion of Kansas is more level, the depressions are shallow, long, and gradual, timber less abundant, the streams not so frequent, and the country in general is not so well adapted to sustain a large population as the more eastern part. This portion extends W. of the former for probably about 200 miles, and includes part of that great belt of desert extending from the 47th deg. of N. Lat. southward to New Mexico. Good grasses, however, are found in many places, and ultimately much of it may be found suitable for grazing. That section of the country lying along the eastern slope of the Rocky Mountains is represented as one of great beauty. It is well supplied with timber, and well watered by numerous streams winding in various directions between gently sloping hills and ridges richly covered with grass. Over these hills, and on the broad plains at their bases, buffaloes range in thousands, feeding upon the bunch and buffalo grasses with which this district is densely covered. It is said that few countries in the world are better suited for grazing, have a finer climate, or more interesting scenery than this portion of Kansas.

The principal river within the territory is the Kansas or Kaw, one of the largest affluents of the Missouri. It rises by two large forks, which have their sources near the eastern base of the Rocky Mountains, and flowing eastward, mostly at a considerable distance from each other, unite their waters at Fort Riley, where the Kansas proper commences. Republican Fork, the more northern and longer of the two, issues from Lake Kansas, and has as its principal affluents First Creek, Prairie Dog Creek, and Sandy Creek, all on the right. The chief affluents of Smoky Hill Fork are the Solomon Fork, and the Grand Saline Fork, both on the left. The Kansas is about 1200 miles in length from the source of the Republican Fork, and is navigable for steamers as far as the junction of its two great forks, if not farther. The principal of the other streams watering this territory are the Osage and the Arkansas, with its tributaries the Neosho, Verdigris, Little Arkansas, and Red Fork. The Missouri forms part of its eastern boundary, and affords it a ready outlet for its productions. In the great Kansas valley below Potawatomie, and in the eastern region along the Missouri, there are some of the finest hemp lands in the world. Wheat, corn, oats, and vegetables grow as well there as in any of the western states. The winters are generally dry and pleasant. Little snow falls, and even then lies on the ground only for a short time. The summers are long and warm; while on the high lands the heat is generally fanned by refreshing breezes. Ploughing commences in January; much rain falls from March to June, and the months of August, September, and October are dry and pleasant. The trees are chiefly oak, walnut, ash, hickory, mulberry, hackberry, linden, and cotton-wood. Some 40 miles up the Smoky Hill Fork an extensive bed of gypsum has been found, specimens of which have been tested and found to be of superior quality. Salt is also alleged to be very abundant on the Saline Fork. Specimens of coal, both bituminous and anthracite, and of tin, lead, and iron ore, have been found.

In 1854 a bill was introduced into Congress for forming that extensive tract of country then known as Nebraska, and which formed part of the Louisiana territory purchased from the French in 1803, into two territories, Nebraska and Kansas. This has again led to the agitation of the slavery

Kansas.

question, which has so frequently occasioned disputes between the Northern and Southern States. On the admission of the state of Missouri as a member of the Union in 1820, this question was fiercely debated, the House of Representatives having passed a resolution that it be admitted only as a free state, but in this the Senate refused to concur. At length a compromise was effected, the House of Representatives consenting to Missouri being a slave state, on condition that slavery shall be prohibited in all those states that may subsequently be formed out of that portion of the Louisiana purchase lying N. of N. Lat. 36. 30. In terms of this compromise, Nebraska and Kansas could be admitted into the Union only as free states; but, notwithstanding this, the pro-slavery party maintained that the first population of a territory have alone the right to determine the political and social institutions of that territory, and, in accordance with this, an act was passed, declaring that whether these shall subsequently be admitted into the Union as slave or free states shall be determined by the voice of the inhabitants at the time of their admission. This partial success served only to incite the pro-slavery party in the United States to farther exertions, and slaveholders from the Southern States flocked to Kansas in great numbers, while, on the other hand, emigration societies were formed in various parts of the Northern States for the purpose of forwarding to it colonists holding anti-slavery principles. Nor is this all, the neighbouring state of Missouri has taken an active part in the struggle. The Missourians crossed the border in immense numbers on election days, to swell the votes of the pro-slavery party, and they even had recourse to intimidation and force to restrain the "free soilers" from voting. Judges who refused to receive their votes, without administering the oath as to residence in the territory, were expelled, and others of the Missourians appointed. These are known as the "border ruffians," and are the most dangerous class in the territory, having frequently recourse to bloodshed and murder to accomplish their purposes. It is evident that the legislature thus elected would represent the opinions of Missouri rather than that of Kansas. In terms of two conventions of delegates representing the people of Kansas, and repudiating all the acts of the so-called territorial legislature, an election was held on the 4th day of October 1855, for choosing members of a convention to form a state constitution, preparatory to application for admission as a state of the Union. The number of delegates was fixed at fifty-two, and no non-resident, and no one who had not been resident for thirty days, was allowed to vote. The constitution adopted by these delegates was one eminently republican in its character, and embracing the views of the majority in the territory, by whom it was ratified. On the 9th of April 1856, a bill was presented to the Senate of Washington for the admission of Kansas as a state into the Union, and the debate on the question is memorable on account of a brutal attack made upon the Honourable Charles Sumner by Mr Brooks, a member of the House of Representatives for the slave state of South Carolina. The president and the executive manifested their sympathies in favour of the slavery party, and under the plea of preserving peace, are charged with supporting the movements of the "border ruffians" by the federal troops. On the eve of the adjournment of last Congress (1856) the feeling was so strong against the President for thus supporting the slavery party, that the House of Representatives threatened to stop the supplies, and it was with great difficulty that the executive were able to secure a majority of three. For the later history we must refer to the article UNITED STATES.

In terms of the act passed in 1854, Kansas was divided into eighteen districts, and was found to contain a population of 8521 persons, of whom 5138 were males, and 3383 females. The number of slaves was 192. This was in the

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eastern part; the central and western parts being still in the possession of the wandering tribes of Indians, of whom it is estimated that there are about 25,000 in the territory. The chief town, Leavenworth, on the Missouri, is estimated to contain a population of about 1500.

KANSUH, the most N.W. province of China, lying between N. Lat. 32. 30. and 40., and E. Long. 98. and 108., and bounded on the N. and W. by Mongolia, into which it projects a long tongue of land, E. by Shen-si, and S. by Shen-si and Szuchuan. The surface is mountainous, some of the peaks rising to more than 10,000 feet above the level of the sea. The principal river is the Hoang-ho, or Yellow River, which flows in an easterly direction through the province. The climate is rather cold; and the soil in general sterile. Wild animals abound, and large flocks of cattle are kept in the province. The capital is Lan-chou. Pop. about 16,000,000.

KANT, IMMANUEL, the greatest metaphysician of the eighteenth century, was born at Königsberg, the chief city of Eastern Prussia, on the 22d April 1724. His father, John George Cant, was the son of a Scottish emigrant, who, according to the testimony of the philosopher himself, had left Scotland about the end of the seventeenth century, when a considerable influx of Scotsmen took place into the Prussian territories upon the Baltic, as is proved by the names of their descendants, Douglas, Simpson, Hamilton, &c., which survive to this day. Kant's grandfather, in regard to whose profession or original residence in Scotland nothing is known, settled ultimately at Tilsit, but seems to have halted for a time at the seaport of Memel, near which the father of the philosopher was born. This individual removed at a very early period of his life to Königsberg, where he learned the trade of a saddler, and carried on a small business in that department, working at the same time with his own hands. In his character, though in comparatively humble life, the hereditary intelligence and piety of the Scottish stock were conspicuous; and he found a like-minded associate in a wife, of German blood, Anna Regina Reuter, who possessed a mind far above her station, and religious sensibilities of the liveliest nature. To the virtues of his parents Kant ever delighted to bear honourable testimony; and the image of his mother in particular, to whom he bore a marked resemblance, was indelibly impressed upon his mind. He was the fourth of eleven children, of whom most died in infancy, and none, besides himself, attained to any distinction. His parents, whose income was barely sufficient to raise them above debt, zealously exerted themselves for the education of their children; and as Kant displayed the most hopeful talents of the family, though he accuses himself of sloth and truancy, it was early resolved to train him for some learned profession. That to which he was first destined was theology. At ten years of age, he was entered in the Frederick's College, a classical seminary, then under the presidency of Dr Schultz, one of the city clergy, and an excellent man, whose religious strictness exposed him to the charge of pietism, notwithstanding that he was an eminent disciple of the philosopher Wolff, and a professor in the university. Under the influence of these views, to which his parents were also most earnestly attached, the youthful Kant was trained; and though he afterwards renounced the doctrines of his instructors, their moral impression was apparent to the last in the purity of his life, and the elevation of his ethical system. The seven years of his course in the gymnasium were chiefly marked by his zeal for the classics, in which the great philologist Ruhnken was his fellow-student. Towards metaphysical pursuits he showed at this time absolutely no tendency. In the year 1740 Kant entered

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the university of Königsberg as a theological student, in which character he preached occasionally in the neighbouring country churches. He soon, however, abandoned this course, apparently from some change in his views of doctrine, and devoted himself to the mathematical and physical sciences, but without as yet manifesting any taste for philosophy. He mastered with eagerness the higher mathematics of Newton; and his whole subsequent writings bear deep traces of his familiarity with this study. During the last years of his university career, the straitened circumstances of his father, his sole surviving parent, compelled Kant to have recourse to private teaching of the humblest kind in the town of Königsberg, till, in 1746, his father's death dispelled for the time his hopes of ultimately obtaining some place in the university, and obliged him to seek employment as a domestic tutor at a distance. In this position he spent nine of the best years of his life, from 1746 to 1755, exchanging one family for another, and at last returning in that of a nobleman of the name of Kayserling to his favourite Königsberg. The lady of this house seems to have discovered his extraordinary qualities, which were not unnoticed in other families; and in spite of Kant's own complaint that this mode of life was his necessity and not his choice, it certainly enlarged his knowledge of the world, and added to his other accomplishments the grace and polish of refined society, which he displayed ever afterwards to a degree somewhat unusual in a philosopher by profession. In 1755, Kant, having returned to the university, obtained the standing of a private lecturer, on entering which office he delivered two theses—one *de igne*, another on the first principles of metaphysical science.¹ Fifteen weary years passed away in this obscure station, during which he lectured over almost the whole encyclopedia of human knowledge, but with a prevailing fondness at first for the physical sciences, to which philosophy was rather subordinate. A favourite course with him was physical geography; and this retained its place when other topics of his early years were laid aside. He became almost from the first a popular lecturer, and was often called upon to deliver special courses to persons of distinction, while, at the same time, his class-room was filled with amateur students, many of them in the prime of life. While thus active in his public duties, he continued to publish, at irregular intervals from 1755 to 1770, a series of essays and treatises, which all bear the stamp of his great powers, but only dimly foreshadow his future philosophy. Of these, perhaps the most remarkable is his *Theory of the Heavens*, published anonymously in 1755, and dedicated by its author, who set a high value on it, to Frederick the Great. It consists of a bold attempt to extend the Newtonian theory to the original formation of the planetary system, and is remarkable as containing, amongst other anticipations, a prediction of the discovery of additional planets, such as Uranus and Neptune, and of the resolution of the nebulae into systems of stars. The style of this treatise Kant never surpassed; and, with his other works of this early period, it proved him to belong to the great family of metaphysicians, represented by Aristotle, Descartes and Leibnitz, to whom the most widely remote fields of knowledge have been equally familiar. In 1763 appeared an equally elaborate work on the *Only Possible Method of Demonstrating the Existence of God*. This states the argument from design, which, of course, Kant does not hold to be demonstrative, much in the same light as his subsequent philosophy; but the demonstration itself, resting upon the necessity of a deity to account for the abstract possibility of things, is a remnant of the Wolfian metaphysics, against which he afterwards waged so remorseless a warfare. Far inferior to these trea-

¹ He had already published in 1747 his first work, *Thoughts on the True Measure of Living Forces*. This treatise, written at the age of twenty-two, contains a most acute and elaborate refutation of the doctrine of Leibnitz, and is worthy to rank with the best in that famous controversy.

Kant. tises in vigour and freshness, is his essay on the *Evidence of the Principles of Natural Theology and Morals*, which obtained in 1763 the *accessit* prize from the Berlin Academy, the first honour being gained by Moses Mendelssohn, who soon after became his correspondent, and, in several points, his friendly antagonist. To this period belongs Kant's acute tract on the *False Subtlety of the Syllogistic Figures*, the last three of which he shows to contain unexpressed propositions, and to be merely contorted forms of the first and only legitimate figure. These writings, with the growing number of his pupils, gradually spread his fame beyond his immediate circle, and gave him a place with Sulzer, Lambert, and Garve, among the lights of German philosophy. It was long, however, before he could obtain a congenial position in his own university. In 1764 the Professorship of Poetry was offered him and declined. His first post was that of under keeper of the royal library, at the modest salary of less than L.10 a-year, conferred on him in 1766, as a person "fully accomplished, and celebrated for his learned writings." In 1770, after declining offers from Erlangen and Jena, he was promoted, as the reward of his patience, to the ordinary chair of logic and metaphysics in Königsberg, the emoluments not amounting in all to more than L.60 per annum. On this occasion, he published his celebrated thesis *De Mundi Sensibilis et Intelligibilis Forma et Principiis*, which contains more than the germ of his succeeding philosophy, and proves that by this time he was in possession of the key to all his future discoveries. Hardly any mind so great ever ripened so slowly; and it was not till after eleven years more of patient thinking, often interrupted by delicate health, that his completed system was given to the world. His *Critique of Pure Reason*, by far his greatest work, was published in July 1781. It was dedicated to Baron von Zedlitz, minister of public instruction in Prussia, an accomplished and liberal-minded man, who had honoured Kant with many marks of his favour, and sought in vain to remove him to Halle in 1778 by the prospect of a double salary, and a larger academic sphere. The *Critique* contained a complete revision of metaphysical science, and was the most important work that had appeared in philosophy since the *Meditations* of Descartes, or Locke's *Essay on the Human Understanding*. It was the first great work of the kind in the German language. It terminated for ever the metaphysical dogmatism of Leibnitz and Wolf; while, at the same time, it sought to outflank the scepticism of Hume, and determine infallibly the contents and limits of philosophical knowledge. An outline of its doctrines will be found below, whence some conception of its extraordinary originality and herculean vigour of thought may be obtained. As was natural with such a work, it made its way at first slowly, and was exposed to some ignorant or captious reviews, one of which especially denounced it as a system of idealism; but its chief danger lay of sinking into oblivion, before its true significance could be ascertained. Hence Kant, in 1783, published a kind of running commentary on his first work, and reply to his critics, under the title of *Prolegomena to every Future System of Metaphysics claiming to be a Science*. This more popular and interesting treatise, which is still by far the best introduction to the Kantian philosophy, made a great impression, and by degrees the new system attracted universal attention, and provoked unexampled controversy. A second edition of the *Critique* was called for in 1787, and considerably modified, so as to obviate the charge of idealism, after which it remained unaltered.

Meanwhile Kant laboured with intense ardour, though now upwards of sixty years of age, to perfect the development of his philosophy in all its compass. His *Metaphysics of Ethics* appeared in 1785; his *Metaphysical Principles of Natural Science*, in 1786; his *Critique of Practical Reason*, in 1788; and his *Critique of Judgment*, which in

some measure crowned his system, and contained its applications to aesthetics and natural theology, in 1790. His ethical system, in its turn, attracted almost as much notice as his speculative; and the energy with which he set forth the moral law as a categorical imperative or absolute precept of reason to itself, and condemned all intermixture of sentiment with this sovereign motive, made the deepest impression. His speculative system seemed to have shut the door on all communion between the human mind and the infinite; but his doctrine of practical reason withdrew the obstacle, and in connecting man with absolute duty, restored him for all practical ends to absolute truth.

In spite of its frequent obscurity, its novel terminology, and its declared opposition to prevailing systems, the Kantian philosophy made rapid progress in Germany. In the course of ten or twelve years from the publication of the *Critique of Pure Reason*, it was expounded in all the leading universities, and it even penetrated into the schools of the Church of Rome. Such men as Schulze in Königsberg, Kiesewetter in Berlin, Jacob in Halle, Born and Heydenreich in Leipzig, Schmid in Jena, Buhle in Göttingen, Tennemann in Marburg, and Snell in Giessen, with many others, made it the basis of their philosophical teaching, while theologians like Tieftrunk, Stäudlin, and Ammon, eagerly applied it to Christian doctrine and morality. Young men flocked to Königsberg as to a shrine of philosophy. The Prussian government even undertook the expense of their support. Kant was hailed by some as a second Messiah. He was consulted as an oracle on all questions of casuistry,—as, for example, on the lawfulness of inoculation for the small-pox. Learned ladies joined in the act of pilgrimage; and the whole philosophic world was divided into Kantists and anti-Kantists. Much of this enthusiasm was only transient; and in the case of a Reinhold or a Fichte, the vehement idolater only portended the future iconoclast. This universal homage for a long time left Kant unaffected; it was only in his later years that he spoke of his system as the limit of philosophy, and resented all further progress. He still pursued his quiet round of lecturing and authorship, and contributed from time to time papers to the literary journals. Of these, among the most remarkable, was his review of Herder's *Philosophy of History*, which greatly exasperated that author, and led to a violent act of retaliation some years after in his *Metakritik of Pure Reason*. Schiller at this period in vain sought to engage Kant upon his *Horen*. He remained true to the *Berlin Journal*, in which most of his criticisms appeared.

In 1792, Kant, in the full height of his reputation, was involved in a painful collision with the government on the question of his religious doctrines. Another minister of spiritual affairs had replaced Von Zedlitz; and, in an age peculiarly lax and heterodox, an unwise attempt was made to apply a rigid censorship to works of philosophical theology. It was not wonderful that the philosophy of Kant had excited the declared opposition of all adherents of historical Christianity, since its plain tendency was towards a moral rationalism, and it could not by any process of interpretation be reconciled to the literal doctrines of the Lutheran church. It would have been much better to permit his exposition of the *Philosophy of Religion* to enjoy the same literary rights as his earlier works, since Kant could not be interdicted without first silencing a multitude of theologians who were at least equally separated from positive Christianity. The government, however, judged otherwise; and after the first part of his book, *On Religion within the Limits of Pure Reason*, had appeared in the *Berlin Journal*, the publication of the remainder, which treats in a more rationalizing style of the peculiarities of Christianity, was forbidden. Kant, thus shut out from Berlin, availed himself of his local privilege, and, with the sanction of the theological faculty of his own university,

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published the full work in Königsberg. The government, who were probably as much influenced by hatred and fear of the French Revolution, of which Kant was supposed to be a partizan, as by love of orthodoxy, resented the act; and a secret cabinet order was received by him intimating the displeasure of the king, Frederick William II., and exacting from him a pledge not to lecture or write at all on religious subjects in future. With this mandate Kant, after a struggle, complied, and kept his engagement till 1797, when the death of the king, according to his construction of his promise, set him free. This incident, however, produced a very unfavourable effect on his spirits. He withdrew in 1794 from society; next year he gave up all his classes but one public lecture on logic or metaphysics; and in 1797, before the removal of the interdict on his theological teaching, he ceased altogether his public labours, after an academic course of 42 years. He had previously, in the same year, finished his two treatises on the *Law of Nature*, and on *Practical Morals*, which, with his *Anthropology*, completed in 1798, were the last considerable works which he revised with his own hand. His *Lectures on Logic*, and on *Physical Geography*, were edited during his lifetime by his friends and pupils. By way of asserting his right to resume theological disquisition, he also issued in 1798 his *Strife of the Faculties*, in which all the strongest parts of his work on religion were urged afresh, and the correspondence that had passed between himself and his censors was given to the world.

From the date of his retirement from the chair Kant declined in strength, and gave tokens of intellectual decay. His protest against Fichte, published in 1799, is perhaps to be traced to this cause; and he manifested other signs of uneasiness at the revolt of his former disciples from his authority. His memory began to fail, and a large work at which he wrought night and day, on the connection between physics and metaphysics, was found to be only a repetition of his already published doctrines. After 1802, finding himself attacked with a weakness in the limbs, attended with frequent fits of falling, he mitigated a little the Spartan severity of his life, and also consented to receive medical advice. A constant restlessness oppressed him; his sight gave way; his conversation became an extraordinary mixture of metaphors; and it was only at intervals that gleams of his former power broke out, especially when some old chord of association was struck in natural science or physical geography. A few days before his decease, with a great effort he thanked his medical attendant for his visits in the words, "I have not yet lost my feeling for humanity." On the 12th of February 1804, he breathed his last, having almost completed the eightieth year of his age.

It is superfluous to characterize the genius of Kant; but a few words may be added as to his personal appearance and habits of life, study, and teaching.

His stature was small, and his appearance feeble. He was little more than five feet high; his breast was almost concave, and, like Schleiermacher, he was deformed in the right shoulder. His hair was light, his complexion fresh, his forehead high and square, while his eye of light blue showed an expression of unusual depth and power. His senses were quick and delicate; and, though of weak constitution, he escaped, by strict regimen, all serious illness till the close of life.

His life was arranged with mechanical regularity; and, as he never married, he kept the habits of his studious youth to old age. His man-servant awoke him summer and winter at five o'clock; and, on being appealed to on one occasion, testified that Kant had not once failed in thirty years to respond to the call. He studied after rising for two hours, then lectured other two, and spent the rest of the forenoon, till one, at his desk. He then dined at a restaurant, which he frequently changed, to avoid the influx of

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strangers, who crowded to see and hear him,—till in later years his growing means enabled him to invite a friend or two daily to his own home. This was his only regular meal; and as he loved the *ducere cenam* of the Romans, he often prolonged the conversation till late in the afternoon. He then walked out for at least an hour in all weathers, and spent the evening in lighter reading, except an hour or two devoted to the preparation of his next day's lectures, after which he retired between nine and ten to rest. The furniture of his house was of the simplest character; and though he left a considerable sum, the produce of his writings, to his relatives, he indulged in no luxury, and was a pattern of that superiority to fashion and appearance so often met with in the literary life of Germany. In his earlier years he often spent his evenings in general society, where his overflowing knowledge and conversational talents made him the life of every party. He was especially intimate with the families of two English merchants of the name of Green and Motherby, where he found many opportunities of meeting ship-captains, and other travelled persons, and thus gratifying his passion for physical geography. This social circle included also the celebrated Hamann,—the Magus of the North,—the friend of Herder and Jacobi, who was thus a mediator between Kant and these philosophical adversaries.

Kant's reading was of the most extensive and miscellaneous kind. He cared comparatively little for the history of speculation, being in this department more a discoverer than a scholar. But his acquaintance with books of science, general history, travels, and *belles lettres*, was boundless. He was well versed in English literature, chiefly of the age of Queen Anne; and had read English philosophy from Locke to Hume, and the Scottish school. He was at home in Voltaire and Rousseau, but shows little acquaintance with the French sensational philosophy. He was familiar with all German literature up to the date of his *Critique*; but ceased to follow it in its great development by Goethe and Schiller. It was his habit to obtain books in sheets from his publishers Kanter and Nicolovius; and he read over for many years all the new works in their catalogue, in order to keep abreast of universal knowledge. He was excessively fond of newspapers and works on politics; and this was the only kind of reading that could interrupt his studies in philosophy.

As a lecturer, Kant avoided altogether that rigid style in which his books were written, and which was only meant for thinkers by profession. He sat behind a low desk, with a few jottings on slips of paper, or text-books marked on the margin, before him, and delivered an extemporaneous address, opening up the subject by partial glimpses, and with many digressions and interspersed anecdotes or familiar illustrations, till a complete idea of it was presented. His voice was extremely weak, but sometimes rose into eloquence, and always commanded perfect silence. Like Adam Smith, he fixed his eye on one student, and marked by his countenance whether the lecture was understood. The least irregularity in the appearance or dress of this selected hearer disconcerted him; and the story is well known of the missing button, which defeated a lecture. Though kind to his students, he refused on principle to remit their fees, as this, he thought, would discourage independence. It was another principle, that his chief exertions should be bestowed on the intermediate class of talent, as the geniuses would help themselves, and the dunces were beyond remedy. Hence he never delivered his deeper doctrines, such as are found in his *Critique*, from the chair. His other avocations allowed him little personal intercourse with his numerous hearers, and he often complained of the want of lively sympathy and ascertained progress inseparable from such a system.

Simple, honourable, truthful, kind-hearted, and high-

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mindful as Kant was in all moral respects, he was somewhat deficient in the region of sentiment. He had little enthusiasm for the beauties of nature, and, indeed, never sailed out into the Baltic, or travelled more than 40 miles from Königsberg. Music he disregarded, and all poetry that was more than sententious prose. His ethics have been reproached with some justice as setting up too low an ideal for the female sex. The devotional element, as distinct from the moral, was but faint in his nature; and he almost never attended any religious service. Though faithful in a high degree to the duties of friendship, he could not bear to visit his friends in sickness, and after their death he repressed all allusion to their memory. His engrossing intellectual labours no doubt tended somewhat to harden his character; and in his zeal for rectitude of purpose he forgot the part which affection and sentiment must ever play in the human constitution. Those who count these defects most grave will yet find much to admire in the lofty tone of his character, and in the benevolence which could thus express itself: "Whoever will suggest to me a good action left undone, him will I thank, though he suggest it even in my last hour!"

This notice may appropriately close with Herder's beautiful sketch of Kant's character, all the more interesting that it was written in 1795, after their quarrel,—"I have had the good fortune to know a philosopher who was my teacher. In the vigour of life he had the same youthful gaiety of heart that now follows him I believe into old age. His open forehead, built for thought, was the seat of imperturbable cheerfulness and joy; the most pregnant discourse flowed from his lips; wit, humour, and raillery came to him at will, and his instructions had all the charm of an entertainment. With the same easy mastery with which he tested the doctrines of Leibnitz, Wolf, Baumgarten, Crusius and Hume, or pursued the discoveries of Newton, Kepler, and other lights of science, he also took up the current writings of Rousseau, such as the *Emile* or *Heloise*, or any new phenomenon of the natural world, and from the criticism of each came back to the impartial study of nature, and to the enforcement of the dignity of man. History in all its branches, natural science, physics, mathematics, and experience, were the materials that gave interest to his lectures and his conversation; nothing worthy of study was to him indifferent; no faction or sect, no selfishness or vanity, had for him the least attraction, compared with the extension and elucidation of truth. He excited and pleasantly impelled us to mental independence; despotism was foreign to his nature. This man, whom I name with the deepest gratitude and respect, is Immanuel Kant; his image rises before me surrounded with pleasing recollections!"

Subjoined is a brief sketch of the Kantian philosophy, drawn from original sources. The list of the works of Kant, which have been more or less consulted, will be found complete in the twelfth and last volume of Rosenkrantz and Schubert's edition, Leipzig, 1838-42.

The Kantian philosophy is essentially an *Inquiry into the Possibility of a System of Metaphysics*. This gives unity to the whole of Kant's writings on philosophy. His views on psychology and logic are chiefly interesting from their bearing on this great question, while his ethics virtually contain the solution, and are thus a vital part of his metaphysics. His philosophy is nearly all included in his *Critique of Pure Reason*; and this work, accordingly, must be taken as the basis of a development of his system. A few words as to Kant's conception of the problem which he had to solve, and his own view of his relation to other philosophers, will fitly introduce the account of his own metaphysical investigations.

Metaphysics, according to Kant, in which he only echoes the general voice of philosophers, is conversant with the world above sense, or beyond experience. It is occupied

with such problems as the nature of absolute being (*ontology*), the essence and immortality of the soul (*pneumatology*), the prevalence of freedom or fate in the world (*cosmology*), the being of God (*speculative theology*). Such problems as these have eternally recurred to human reason, and cannot be escaped, as there are inevitable tendencies in the mind itself to give them birth. We have faculties that go beyond sense, and elements of thought, which, as being universal and necessary, cannot be derived from experience; and these in their workings infallibly create the inquiries with which metaphysics has to deal.

According to Kant, metaphysical inquiries up till his time had passed through two stages. A succession of systems had confidently decided all the questions that arose, and each of these systems, on its own principles, had announced itself as the consummation of metaphysical truth. This was the *dogmatic* stage. Then the collision of these systems and their inherent contradiction had begotten a distrust of the whole alleged results, and issued in the assertion that sense and experience were the only sources of our knowledge, and that the metaphysical region was an entire illusion. This was the *sceptical* stage which followed in the wake of the other. Kant saw the type of the dogmatist in Leibnitz or Wolff, of the sceptic in David Hume. In contradistinction to both, he maintained the necessity of instituting a critical inquiry into the powers of human reason, so as, on the one hand, to test the sceptic's denial of all beyond experience *in the mind*; and, on the other, to test the dogmatist's application of what was above experience in the mind *to the nature of things*, or the world of metaphysics. The result was, that against the sceptic a whole system of knowledge, underived from experience, was proved to exist in the mind; and that against the dogmatist this knowledge was declared to give no hold, at least so far as speculation is concerned, over the nature of things or metaphysical truth. The Kantian philosophy thus substitutes for positive metaphysics a criticism of pure reason, explaining why there can be none; and at the same time vindicates those elements of knowledge that beget metaphysical inquiry from sceptical rejection and contempt. Hence, in opposition to dogmatism, Kant chose to call his the *critical* philosophy; in opposition to an empirical scepticism which denied the existence of all knowledge *à priori*, or as transcending experience, he called it the criticism of *pure* reason, or *transcendental* philosophy.

Kant admits that, having been once himself a dogmatist of the school of Wolff, he was awaked out of his slumber by Hume's resolution of the causal law into a product of association or experience. He saw that, if there was to be a valid science of metaphysics at all, it must be founded upon a power of the mind to frame such judgments as that of cause and effect antecedently to all experience, and to guarantee their application to the whole realm of being. He was led to generalize the whole class of such judgments, as distinguished by this common character, that they unite two totally unconnected ideas in a single proposition, which, being necessary and universal, is not derived from experience. This is his celebrated designation of *synthetic judgments à priori*, which alone can form the basis of metaphysics; whereas logic deals exclusively in *analytic judgments*, in which the one idea is deduced from the other as assumed, and can never reach the world of reality. These synthetic judgments, touching cause and effect, substance and phenomenon, and other metaphysical ideas, to say nothing of mathematical truths, which, with a bold originality, Kant annexes to the same class, prove an element to exist in knowledge unrecognised by the sensationalism of Locke and Hume. But it remains to be seen how far such judgments reach in binding down absolute truth to the human standard, or in conquering a world of metaphysical reality. The whole *Critique of Pure Reason* is written to prove that

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Kant. they come short of this aim ; and this humbling thesis is elaborately maintained in all the three departments which supply the materials of *pure*, or *à priori* knowledge, or, in other words, furnish the elements of synthetic judgment, viz.,—sense, understanding, and reason. In each of these departments, then, we must show how Kant, on the one hand, lays open elements of knowledge pre-existent to experience ; and yet, on the other, asserts these elements to fail in reaching the nature of things, or in grasping absolute metaphysical truth.

In the world of sense, the transcendental or pre-existent elements of knowledge are space and time. These are pure sensuous intuitions, without which empirical sensations would be impossible. They are hence called by Kant the *forms* or formal conditions of sensation ; the one applying to all sensational experience in the outward world, the other as well to all sensational experience of mental phenomena. As mathematics is occupied with these primary forms of sense, it is easy to see how all its synthetic judgments are originated, because they rest on sensuous intuition or contemplation, comparing mathematical quantities with each other ; and also how they hold good in the actual world of sense, since that world only exists in conformity to these *à priori* conditions. Thus far, Kant, as a transcendentalist, vindicates an *à priori* space and time against the sensationalist who deduces them from experience, as also against the intellectualist, like Leibnitz, who treats them as mere relations of co-existent and successive objects. But no sooner is an attempt made by the dogmatic metaphysician to give to space and time an absolute and eternal reality, or to claim for things as existing in space and time anything but a phenomenal aspect as relative to our senses, than he turns the other or critical edge of his sword to assail this result. His principal argument is, that real and independent existences being facts, can never be known *à priori*, but only through experience ; and hence that, if time and space were independently existing realities, the necessary character of our judgments regarding them would be entirely destroyed. This argumentation will of course be valid with those who allow necessity to nothing but judgments regarding ideas. With those who hold that necessity may belong as well to judgments regarding facts, and that the existence of space and time severally is given as a necessary fact, it will be powerless.

In the department of understanding, which is the second great field of Kant's critical inquiry, substantially the same result is attained. Sense delivers up its presentations in space and time to this higher faculty, whose office it is to introduce into them unity and system, so that they shall deserve the name of knowledge or experience. This is done by the faculty of judgment, the characteristic process of the logical understanding, which combines the multiform data of sense in the unity of propositions. Ordinary logic lays down the *forms* of propositions, irrespective of their matter ; and is entirely *analytical*. But the required connection would not be introduced among the data of sense without certain transcendental or pre-existent elements, which belong to the *matter* of propositions, and consequently furnish *synthetic judgments à priori*, to be investigated by a higher or transcendental logic. These necessary elements, or *à priori* principles of judgment, Kant, by an unhappy adaptation of Aristotle's language, called "categories of the understanding ;" and he developed them in a parallel line with the logical form of propositions, since it seemed to him, though the analogy is more than doubtful, that the *transcendental matter* of judgment must correspond with its *logical form*. This celebrated table of the categories is subjoined :—

	Logical.	Transcendental.
I. Quantity.....	Universal.	Unity.
	Particular.	Plurality.
	Singular.	Totality.

	Logical.	Transcendental.
II. Quality.....	Affirmative.	Reality.
	Negative.	Negation.
	Indeterminate.	Limitation.
III. Relation	Categorical.	Substance.
	Hypothetical.	Cause.
	Disjunctive.	Reciprocity.
IV. Modality	Problematical.	Possibility.
	Assertory.	Existence.
	Apodictic.	Necessity.

As a still higher principle of *à priori* judgment than even the categories, Kant insisted on the consciousness of personality, by which alone unity is introduced among the data of outward and inward perception, and the multiplicity of existence made to converge towards one necessary centre. In regard to this principle, and the twelve categories, he laboured to show that without them no connection of the materials of sense is possible ; that they are thus the intellectual conditions of sensational experience, and that, abstracted from them, even the conception of a single object in nature, much more of a system of things called nature, is unattainable. So far from nature giving laws to mind, mind gives laws to nature ; and it is thus alone that synthetic judgments *à priori* are possible and authoritative, since the only world man can know must exist under these conditions. Such synthetic judgments Kant deduces as corollaries from the application of the categories, with the help of imagination, to *time*, as the main *à priori* datum of sensation. Amongst these synthetic judgments, on the deduction of which a vast amount of ingenuity is expended, is that of cause and effect ; and thus the philosophy of Hume is inverted ; for, while Hume derives the causal judgment from experience, Kant proves that without this judgment, and others akin to it, the very idea of an objective world, and of experience in that world, such as is universally held by all systems of philosophy, idealist as well as realist, would remain impossible. Kant even goes so far in vindication of our original knowledge, against the sensationalist, that he attempts to show that the reality of an outward world, which the sensationalist believes in from experience, can alone be made good by borrowing from the transcendentalist the *à priori* notions of time and of substance ; since the mind, according to Kant, needs some substance distinct from itself to mark the succession of its own ideas, which substance is the external world. But here again, having, as a transcendentalist, dissected and laid open the texture and original furniture of the understanding, he proceeds, as a critical or anti-dogmatical philosopher, to shut up the understanding from all excursions into the region of metaphysical reality, and to limit it to the territory of phenomena or sense. His celebrated distinction between *phenomena*, or objects known by sensible experience, and *noumena*, or objects knowable by the pure understanding, is here brought to bear ; and he allows to the latter only a problematical existence, as the bare negation of what we can know by our understanding, or as something of whose existence and whose mode of being known, if known at all, by other understandings, we must ever remain ignorant. This distinction is thus carried out by him in regard to the actual objects of our understanding. Man must know objects as quantities, qualities, substances, causes, &c., because without these conceptions, as the constitutive and regulative principles of his understanding, that understanding would leave its objects an undigested chaos, as good as none at all ; but whether there be an unknown basis to this phenomenal world or not, or if there be, what its own nature is, must continue, so far as the understanding is concerned, an entire and insoluble mystery. On this point, indeed, Kant's language is fluctuating, and even contradictory ; for in some places he proceeds on the existence of this unknown *x*, and even treats phenomenal existence as its product and manifestation, while he elsewhere, in the strongest terms, maintains that it is only a

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negative conception, and that we can predicate, because we can know, absolutely nothing of it whatever. But his doctrine is so far clear and unambiguous, that our understanding has no power to lay hold on a super-sensible world; that the categories and synthetic judgments of the understanding are mere abstractions, till realized in phenomenal experience; and that unless the *à priori* elements of intellect be brought down, through the ministry of imagination, to unite with presentations of external or internal sense, they have as little significance as the latter would have without their co-operation.

On this fundamental point of the Kantian philosophy much may be conceded by those who yet reject his conclusions. Waiving Kant's error (for such it seems) in making the understanding, which can never be more than a mere logical faculty, the fountain of the categories and so-called intellectual conditions of sensible experience, it may be admitted that such conditions must be furnished by some mental power or other, and that Kant's analysis has in it much truth, if not the whole. It may also be admitted that mind thus unites with nature in forming a joint product of knowledge, to which both elements or factors are necessary. But it may fairly be denied that the world of experience is thus the creature of mind, and that its objects only become such by virtue of subjective laws and necessities, since this would represent the understanding as practising upon itself a constant delusion, and mistaking its own products for objective realities. The validity of our synthetic judgments *à priori* does not, in spite of Kant's oft-repeated asseveration, depend on the fact that these judgments cast our experience in their own mould, without which it would be no experience at all; but it rests upon a mysterious primary belief, by virtue of which these judgments are held valid the moment they are formed, and are extended to all objects in connection with which they can arise. There is not the least reason why, because certain judgments make sensible experience possible, they should either be affirmed to make that experience relative to us, or should be themselves limited to the domain of sensible experience, if capable of being extended beyond it. The causal judgment, for example, is necessary to connect our world of phenomena, outward and inward; but why it should, on this ground, be limited to *our* phenomenal world, or to any enlarged phenomenal world of which *we* may be supposed capable of having experience, is quite inconceivable. It is only limited by its own nature, for, as Kant has justly shown, it pre-supposes time, and change in time, and of course does not emerge without these conditions. So of every other synthetic judgment of the understanding in Kant's series. It is thus plain that Kant's attempt to limit the use of the categories and principles of the understanding is founded on a mistake. It is their own nature which limits them, and not their relativity to *our* sensible experience. A *noumenal* world—or world in which these laws, their proper conditions being given, should be set aside—we have absolutely no power to believe in as existing for any intelligence. That there may be a world beyond the conditions of time and change, which are the highest principles of Kant's synthetic judgments of the understanding, is not in the least degree opposed to the universal necessity of these judgments, for they ask no validity beyond their own condition or sphere. This is the only sense in which Kant's *noumenal* world can be admitted; and the investigation of this problem belongs to the next section of his inquiry. But it must be contended that he has no right, so far as he has yet proceeded, to introduce a contrast between things in themselves and things as conditioned by the laws of our understanding, and that his *noumenal* world, lying at the bottom of our actual world, and exempted from the laws of our necessary synthetic judgments, is a mere superfluity and self-made shadow. If it be a pure license

of thought, let it remain so; but let not Kant claim for it, as a veritable world, exclusive metaphysical reality, to the disparagement of the only world we know, in which the laws of the understanding find their application.

It is in the third and last grand division of Kant's critical philosophy that all the highest questions of metaphysics find the possibility of an answer denied. This division is occupied with the Reason or Faculty of Ideas. The idea is a Platonic word, as the category an Aristotelian, and denotes, in Kant's writings, an object which cannot be reached in any possible experience. Reason creates no new materials of its own,—it only enlarges the data of the understanding, by taking in all the conditions on which they depend. Hence, an idea is the sum total of conditions, itself unconditioned, by which a still higher unity is given to the materials of experience than understanding could supply. *Reason resembles reasoning, as understanding resembles judgment*; and since reasoning employs a universal proposition as the condition of a particular conclusion, Reason must, in finding out the sum total of conditions, follow an analogous procedure to the processes of reasoning; whence, as there were twelve categories corresponding to the twelve forms of propositions, there are three transcendental ideas corresponding to the three processes of reasoning—categorical, hypothetical, and disjunctive. These ideas, which are deduced even in a more strained and arbitrary fashion than the categories, are,—(1.) Pure thinking, substance, or soul, the correlate of an absolute subject in a categorical syllogism, and the basis of the science of *rational psychology*; (2.) The totality of dependent phenomena in space and time, or the world, the correlate of the consequent in a hypothetical syllogism, and the basis of *cosmology*; and, (3.) The Highest Ideal, which is the condition of the possibility of every object of thought, or God, the correlate of an exhaustive disjunctive syllogism, and the basis of *theology*.

These three ideas Kant, as a transcendentalist, strenuously maintains to have their birth in human reason, irrespective of all experience, and to spring up inevitably, so as to control and influence the working of the understanding as applied to experience. But they differ, he contends, from the categories in this, that they cannot be brought down by the ministry of imagination and united to experience in any presentation within the limits of space or time, so that they have no objective validity, and are designed to serve no other use than to regulate our own thoughts. Nevertheless they perpetually tend, by a necessary sophistication, to acquire objective subsistence; so that, from being mere postulates, or maxims of reason employed to give our subjective views of experience the greatest enlargement and unity, they become assertions as to absolute existence, and posit their objects—a pure, incorporeal spirit; a world, finite or infinite, dependent or independent; and a supreme Being—amongst the entities of metaphysical reality. This so-called dialectical illusion it is the aim of the most interesting and energetic part of Kant's *Critique of Pure Reason* to expose; and here the critical thrusts of his philosophy seem to bear most hard upon the treasured and precious convictions of the human race. A brief notice of his elaborate argumentation is all that can be given, with still briefer hints of its failures and deficiencies.

He first unmasks what he calls the *paralogism of pure reason* in regard to the thinking subject, or soul. It may be remarked that this is one of the most forced of all Kant's ideas, since it is only his transcendental self-consciousness, already discussed as the highest principle of the understanding, brought up under a new form, and without any reference to the sum total of the conditions of experience at all, in which an idea according to him ought to consist, given forth as a pure idea of thinking substance—simple, personal, incorruptible, &c. The dogmatic conclusions of rational psychology, as founded on this idea, Kant opposes

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by showing that they confound the *consciousness of the mind in thinking* with its *nature as an object in existence*. He grants the consciousness of simplicity, personality, &c., but denies the validity of the inference which would guarantee the indivisibility of the soul and its unaltered substance, as well as unbroken duration; since all this lies beyond the compass of experience in space and time. Few will contend against Kant that the bare *a priori* necessity of unity in our consciousness, apart from experience, would warrant any solid inference as to the substance or fortunes of the soul, as few will care to defend a so-called *rational* psychology from his attacks. But it seems too much to ask that mental simplicity, unity, and identity, as admitted *facts of experience*, should go for nothing, and that any and every inference against the materialist should be forbidden, so as to leave room for a supposition like Kant's, that, for aught we can tell, the unknown base of mind and matter, in spite of their divergent phenomena, may be the same.

Kant next discusses his second Idea of Pure Reason, or the World, that is, the sum total of the conditions of phenomena presented in sensible experience. The world is thought under the categories of the understanding; and each of the four leading categories, when extended beyond experience, gives birth to a transcendental idea, or rather a pair of such ideas contrasted and opposite; for, in *quantity*, the world is either bounded by a limit in time and space, or unbounded; in *quality*, it is either ultimately simple, or infinitely divisible; in *relation*, it is either caused by free activity, or made up of an infinite series of mechanical causes; and in *modality*, it has either an independent cause, or is composed of mutually dependent members. Such are Kant's famous antinomies, which brought the controversies of ages to a focus, and have exerted an immense influence on all later European philosophy, giving birth to a whole body of celebrated discussions respecting the conditioned and unconditioned, and necessitating the German philosophy of the Absolute to build upon contradiction, or at least upon antithesis, as the essence and criterion of truth. Kant endeavours to show that each of the two sides of the antinomy is speculatively as well supported as the other, and that the human mind must remain eternally *in equilibrio*, if the forms of thought are held to apply to the realities of existence.

It is of course impossible to condense Kant's reasoning on this subject. It may be remarked, however, that his four antinomies seem reducible, when liberated from the network of the categories, to two, arising from the notions of whole and part on the one hand, and of cause and effect on the other. Kant's two first, or mathematical antinomies, fall under the first head; his two last, or dynamical, under the second. It is readily conceded to Kant that we cannot reach in experience or in thought a time eternal or a space infinite, or stop with a finite of either kind. And it is as freely admitted that we cannot reach an infinite series of parts of any given portion of space and time, or stop with a finite. Applied to these mysterious quantities—space and time—Kant's antinomies seem invincible; but it may be questioned if his argumentation has any force at all in regard to a *world* in space and time, considered either in its totality or in its parts. If I am allowed to think space and time as not merely forms of imagination, but as independent entities, I can easily make them boundaries of matter, and thus reach a universe that had a beginning and that has a limit, so as to escape Kant's first antinomy; and by the same means I can reach a part which may be believed to be ultimate, though it is greater than a conceivable subdivision of the space which contains it, and thus escape his second. The difficulties, too, are of different magnitude on the side of the infinite and of the absolute. We cannot exhaust the former by imagination, but we can readily stop in imagination with the latter at the bidding of any higher reason which should give law to that faculty. In

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other words, the infinite labours under an insuperable difficulty of imagination; the absolute labours under a superable difficulty of belief.

The remaining antinomy of freedom or necessity in the universe, including Kant's additional one of independence or contingency, which may be easily reduced to it, does not seem capable of stronger resistance. There must be free causation somewhere, Kant argues on the one side, else there is no causation at all; and there cannot be free causation, he argues on the other, since the free cause is itself an effect. This latter assertion is, however, based on a false idea of causality. The energy of causation is destroyed by the supposition of an infinite series of dependent causes, each receiving and transmitting a mechanical impulse. Unless there be somewhere a single First Cause there is no true causation; for the multiplication of relatively caused phenomena cannot solve the problem or explain so much as one of the series. Kant's feeble conception of causality, as little more than regulated sequence in time, permitted him to leave both sides of the antinomy equal; but a juster definition would reduce all mechanical causation to the mere effect of free causation, and would thus abolish Kant's last antinomies, so as to place, even on the basis of pure reason, carrying out the causal law to its limits, a single hyper-physical cause at the head of a dependent universe. The causal judgment, in its true construction, runs up all dependent phenomena in time to an absolute beginning, and thus bursts through Kant's two last antinomies; while it also supplies the element of will or freedom, which, by setting limits to matter in space and time, decides against the validity of his two first, as alleged insoluble contradictions of reason.

Kant's own solution of his antinomies is very different. He maintains that they only arise from our inveterate habit of confounding our own laws of thought with independent existence. If existence had to be subjected to each dilemma, nothing would remain but pure scepticism. It is only our own confusion of a totality in our conceptions with a totality in things, as existing in themselves, which misleads us; whereas if we would only confess that the idea of the world in its totality is too great for us, and would confine it as a regulative principle to our thoughts in order to give them their greatest enlargement, leaving existence altogether undefined, we should be empowered to discard both sides of each dilemma, and to hold existence as unaffected by neither. Unfortunately this seems forbidden by the law of excluded middle between contradictories, which applies to existence as well as to thought; and thus Kant's denial of the metaphysical range of his antinomies, and his attempt to speak pleasantly of them as a torment and doom of finite reason for mistaking its shadows for realities, its fragments for the whole of things, is a consolation which can only be accepted by despair. Our knowledge of existence becomes thus not only faint but null; and speculative reason goes out in darkness.

A few words remain to be added respecting Kant's third Idea of Pure Reason; the Being which is the condition of the possibility of all being, or God. This Being, according to the exhaustive process of a disjunctive syllogism, in resemblance to which the idea is framed, possesses all reality; hence, though a mere idea of reason, it is objectified, hypostatized, personified; and afterwards this dialectical illusion is supported by three arguments,—the only three that can be employed to prove the existence of such a Being on the ground of speculative reason. These three arguments for the existence of God, which, after Kant, have been generally called the *ontological*, *cosmological*, and *physico-theological*, are subjected to rigid analysis, and successively declared insufficient. The *ontological* argument, or that which, in the hands of Anselm or Descartes, from the bare notion of an all-real or perfect Being, deduces his existence as a part of this reality or perfection, is shown to

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involve the fallacy of inferring objective existence from a mere logical conception, or, in Kant's language, of substituting an analytic judgment for a synthetic, which latter alone is wanted. The *cosmological* argument, or that which, in the hands of Dr Clarke, from the existence of something contingent, rises to a necessary Being, is declared to come short of any definition of this Being's character; since it cannot invest him with all perfection without taking for granted that very connection between ideal perfection and necessary existence, in assuming which the fallacy of the ontological argument consisted. And the *physico-theological* argument, or that from design and order in the universe, though Kant speaks of it with the highest respect, and declares it sufficient to awaken the speculatist from his subtle objections and difficulties, as from a dream, is nevertheless affirmed to stop short of the ideal of Deity, inasmuch as the finite cannot warrant an inference to the infinite; and thus the argument *a posteriori* is left to depend for its completion on the *a priori* resources already proved in themselves incompetent.

It seems possible to escape these negative conclusions of Kant only by enforcing the law of causality, so as to rise from the actual universe to an absolute First Cause, not merely of the order of this universe, but of its existence; with which First Cause the attributes of perfection or infinitude are then united, not by any ontological argument, but by a native belief. The limitation inseparable from a logical process in proving a Deity is thus avoided; and yet existence, in conformity with the universal judgment of reason, is traced back to an uncaused and independent original. Few have ever cordially accepted the marvellous results of Kant's criticism of speculative theology, according to which, Reason gives birth, along with other regulative ideas, to an idea of God, and compels us to think and arrange the universe in our minds,—*as if it had been made by a Being conformable to this idea*,—while it is yet utterly impossible for us to find a rational ground for believing in His existence.

Thus the soul, the world, and God, are left by Kant's speculative philosophy as problems not only unsolved, but, according to him, demonstrably insolvable; and, if no other oracle existed within, the riddle of man's being and relation to existence would remain unread. Such an oracle, however, is found in Practical Reason; and, to use a figure of Rosenkrantz, the life-boat of Kant's ethics rescues from the shipwreck of his metaphysics the truths necessary to human dignity and happiness.

Kant's speculative *Ethics*, as they are set forth in his *Outlines*, and his *Critique of Practical Reason*, are chiefly occupied with his analysis of the moral law as the ultimate fact of our practical nature, in which it holds a place, corresponding to the ideas of speculative reason. Unlike these ideas, however, the moral law is an assertion,—an assertion of something to be done, and done with absolute necessity for its own sake,—hence it is a *categorical imperative*. Here, for the first time in human reason, we meet an idea realized, or to be realized in experience; and thus our foot is planted upon the unconditioned, absolute, noumenal, or intelligible world. The moral law, as a categorical imperative, cannot determine the will by any motives beyond its own authority; hence, by nothing in the matter of its precepts, but only in the form; and as the only formal element in the will, in relation to motives, is voluntary determination, it follows that the moral law, as a universal and necessary imperative, involves *autonomy* or freedom, without which it cannot possibly exist. The moral law, as a law abstracted from all matter, and only retaining the form of legislation, or its relation to a free and self-determining will, necessarily expresses itself in these formulas, which are all equal, and which all flow from this principle:—"Act as a self-ruled agent, and not

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as a determined." "Act at all times so that your action may become a universal law." "Act so that each moral agent shall be treated as an end to himself." The moral law, as an *a priori* revelation, thus excludes all motives that do not directly spring from itself, and regard itself as law; so that all systems of morality, which admit other motives such as personal happiness, general benevolence, the love of perfection, or the will of God, fall under the charge of *heteronomy*. The law, as an imperative, governs by its own force; the only permissible moral sentiment is moral awe; and just in the degree in which this excludes other sentiments, as well as overcomes the working of passion and self-love, is an action morally pure. The imperative aspect of the moral law is the same to all intelligences, except the Highest; and, according to Kant, we dare not affirm that any can in any stage of their being be trusted without its influence.

While the moral law thus acts independently of all considerations of utility or happiness, it links us at the same time with a moral world, in which we cannot but believe that virtue and happiness are connected, and in which the moral law itself, by embracing the happiness of others in its precepts, makes it our absolute duty to strive after their connection. This moral world, in which virtue and happiness go hand in hand, corresponds to the ancient ideal of the *highest good*; and the belief in its existence is a necessary postulate of the moral law, which cannot be carried out if this faith in a moral world be subverted. Hence Kant employs this postulate of the highest good to gain a firm hold of immortality, which could not be secured by speculative reason, and shows that, without immortality, an infinite progress towards perfect virtue is impossible. In like manner he establishes the otherwise problematical existence of God, on the ground that God must exist as the source of the blessedness to the good; and, from his attributes as the author and ruler of this moral world, in which happiness is made to follow duty, he deduces all those perfections which speculative reason left doubtful. And while the *first* and *third* ideas of speculative reason are thus alleged to find solid footing, the *second*, or that of free causation, is also established on the basis of that liberty which is the condition of the moral law, or rather its inseparable correlative. Though actions must still be looked on as necessitated by motives, so long as man is considered to belong to the sensible world, yet in the higher or intelligible world to which, as the subject of the moral law, he belongs, they are absolutely self-caused; and thus the worst dilemma of speculation is practically decided in the interest of freedom.

It cannot be denied that there is a singular vigour and individuality in these ethical labours of Kant; and, in point of fact, his influence as the preacher of an unconditioned moral law not only awakened the schools, but even vitalized the pulpits of Germany. Nor can a certain accordance with the deepest convictions of the greatest thinkers of all ages be overlooked in his turning round for the solution of the gravest speculative difficulties to the oracle of practical duty. At the same time very serious objections lie against his ethical, not less than his speculative system. The radical difference between speculative judgments containing mere knowledge, and moral judgments bearing on right and wrong, is obscured by the common designation, *Reason*. The influence of moral sentiment, especially love of goodness, is all but proscribed and withered under the stern law of duty. The very law of duty, by the necessity of abstracting from all motives and all matter,—in short, everything but the bare form of law, becomes vague and indefinite; so that Kant's categorical imperative, in all its formulas, is rather a problem of the understanding than a law written out on the heart; and Kant himself, in the subsequent development alike of his system of jurisprudence and of virtue, has shown himself unable, except in the most constrained manner, and by the help of the very principles

Kant. and sentiments he had condemned as selfish and utilitarian, to bring down his generalities to practice. It must be confessed, also, that his settlement of the outstanding speculative problems, by the help of ethics, is not remarkably happy. Immortality is only deduced from the incurable defects of moral agents, which require an everlasting purgatory to remove them. Freedom is not directly based on the fact of felt responsibility, but rather on the utterance of a particular kind of law, viz., a categorical imperative, which contains at best an inferential assurance of power to obey. And God, instead of having his authority absolutely and unconditionally revealed as that of the Lawgiver, is rather discovered by the circuitous and secondary necessity of squaring the moral law and its consequences.

The third of Kant's leading critiques,—that of *Judgment*,—contains his *Æsthetics* and *Doctrine of Final Causes*. It consists of an elaborate attempt to find in judgment a middle term between understanding and reason, corresponding to the middle term between our intelligence on the one side, and our will on the other, furnished by pleasure and pain,—and thus to bridge over the interval between metaphysics and ethics. Kant finds the object of this judging faculty in the harmony of nature, of which, whether æsthetical or teleological, pleasure is the reflex and indication. This whole treatise, however highly lauded in Germany, probably from its tendency to favour, more than Kant's other works, a speculative construction of the infinite and absolute, seems forced in its plan and unsatisfactory in its development, and can only be regarded as interesting and valuable when taken out of the frame of the arbitrary method in which it is set. The discussions on teleology amplify, and in some respects modify, the argument from final causes already noticed (the physico-theological), in a spirit of remarkable conciliation with the ordinary strain of natural theology. The doctrines of æsthetics are propounded for the first time, and may be thus simply stated. The *beautiful* is no real existence in nature, nor is it capable of definition by a single formula; but it is a harmony (arising from an unknown cause which we place in nature) between the free play of the imagination and the laws of the understanding, in the enjoyment of which harmony the pleasure of taste consists. The *sublime* is the struggle of the imagination to grasp the vast in quantity or power, awakening pain from the sense of limitation, but counterbalancing that pain by the higher pleasure of reason, as it tends at the same moment towards the infinite, so that the discord is merged in purer harmony. The chief fault of both parts of this theory is vagueness. What this harmony of the faculties is, is not explained; and, in spite of many ingenious efforts, Kant's promised critical deduction of the validity of general principles of taste, as opposed to individual caprice, ends in little more than an appeal to the uniformity of our common nature.

This exposition of Kant's philosophy may close with an outline of his philosophy of religion, as contained in his work *Religion within the Limits of mere Reason*. This interesting and important treatise, which sets forth at length Kant's point of view as regards Christianity, has much to instruct, but also to pain, an adherent of positive and historical Christianity; though a candid appreciation of Kant's relation to his theological contemporaries will do something to mitigate its offence.

Kant starts in this treatise with such strong views of human depravity, that he has scandalized the naturalist school, who ascribe evil to negation, or to the influence of sense. Free will has, by a mysterious and original surrender, as indicated by Scripture allegories, placed impure motives above the law of duty. The forfeiture, though inexplicable, is real and sad; and the consequent depravity is universal and radical, though, from the very nature of freedom, not irrecoverable by a mighty act of will. This, however, requires a moral crisis or revolution; and the struggle with evil must remain

severe, and, in respect of absolute deliverance from it, interminable. There is, however, a new birth, in which the law of duty recovers its ascendancy; and the pain of repentance in the new man satisfies the justice of God for the sins of the old. This is allegorized in Scripture by the death of Christ as a comprehensive ideal of all the pangs of repentance; so that the new man puts on Christ, that is, the character of a person acceptable to God; is justified by the grace of God, which allows the hidden change to avail before it is proved by experience; and enjoys in the personal consciousness of this change the witness of the Holy Ghost. This is a sample of Kant's moral allegory considered as a principle of Scripture interpretation; but nothing can be more indefinite than the position in which he leaves the life of Christ as an actual history, and the origin of the Scriptures as historical documents. He accepts the record as current and in wide credit; and as, according to the further development of his theory, the individual who has been morally born again, requires for the strengthening of his principles a visible moral society or kingdom of God in which to enrol himself, and to edify himself by sympathy and union; and as, through an invincible infirmity of human nature, all such societies demand some positive religious histories and rites, grounded on alleged revelation, as the vehicles of the one moral religion and the statute-books of the one moral church of God, Kant regards it as matter of thankfulness that the Christian revelation so greatly excels all others in its moral contents; and he ascribes it to a working of Providence—short, however, of miracle—that this revelation has proved hitherto, and will for an indefinite period prove, able to maintain its influence as an inspired authority. Meanwhile, it is the duty of the Christian theologian and preacher to interpret the historical statements of the Christian books in a moral sense, and rather to allegorize them than offend pure reason,—in no case, however, imposing them as necessary to salvation; and it is the duty of the Christian worshipper, without expecting any special blessing from the exercises of religion as means of grace, to employ them as remembrancers of moral obligation, and thus to revive and strengthen reverence for the moral law, and to cultivate a practical disposition to regard all duties as Divine commandments. The gradual disentanglement of religion from historical dogmas and positive statutes is its moral perfection, and the advance of Christianity to this stage is its own goal, the final victory of good over evil, or the coming of the kingdom of God upon earth.

This philosophy of religion could not long satisfy men's minds, though it had great influence in confirming the anti-supernaturalist direction of the age from which it arose. A series of pantheistic schemes sprung up to reverse it, proving with how little ground Kant had appealed to his own ethical religion as a permanent and established contrast to positive Christianity. The right of licentious allegorical interpretation, in pleading for which Kant so strangely forgets the absolute imperative of the moral law, ultimately degenerated into the extravagance of the mythical theory. Schleiermacher, in so much besides the antipodes of Kant, vindicated the claims of the devotional element of our nature against the exclusively moral, and thus restored historical Christianity to its just ascendancy. And nothing has remained of Kant's influence in this department but his tribute to the moral singularity of Christianity, as the only historical religion which has exhausted the moral law; a concession which ought to have led him farther, since, in the circumstances of its origin, this amounted to nothing less than a moral miracle.

It is impossible to enter into the speculations and theories of Kant in other departments, or to narrate farther the reactions and conflicts by which his philosophy as a whole has been attended. This belongs not to the biographer of Kant but to the historian of philosophy. Taken altogether, it is

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Karamsin

impossible to regard his writings as other than a prodigy of human intellect, and his influence as one of the mightiest forces that has ever ruled philosophical opinion. His mark is still on all the speculative sciences in Germany and Europe; and though his sceptre has long been broken, the most opposite systems meet in homage at his tomb. Great as the currency of his leading ideas has been, much still remains in his works to be developed by the struggle and collision of future systems; and it may be safely pronounced that no philosopher of the eighteenth century, perhaps none since the days of Aristotle, has left behind such monuments of thought, or has so firmly imposed the task of mastering them on the speculation of all succeeding ages. (J. C.—S.)

KANTEMIR. See CANTEMIR.

KANTURK, a market-town of Ireland, county of Cork, at the confluence of the Allua and Dallua, 26 miles N.W. of Cork. The town is neatly built. The principal public buildings are the sessions' house, bridewell, workhouse (covering 6 acres), parish church, and Roman Catholic chapel. The chief industrial products are beer, flour, and serges. Pop. (1851) of town, 3125; in workhouse, 3352.

KARAK, a small rocky island in the Persian Gulf, about 15 miles in circuit, in N. Lat. 29, 14., E. Long. 50, 20. On the north side is a small village with about 1000 inhabitants, who support themselves chiefly by fishing and raising fruits. Karak affords a safe anchorage for vessels at all seasons, but especially during the severe gales which blow from the N.W., and are the prevailing winds in this sea.

KARAMANIA. See CARAMANIA.

KARAMSIN, NIKOLAI MIKHAELOVITCH, the greatest of Russian historians, and one of the greatest writers that Russia has yet produced, was born in the government of Simbrisk, Dec. 1, 1765. His family belonged to the lower grades of the nobility, and Karamsin, according to the custom of his class, adopted the profession of arms. He served for some time in the imperial guards, beguiling his leisure hours in minor literary attempts, especially translations from the English and German. Quitting the service in 1789, he set out on a tour through Western Europe, and visited Germany, Switzerland, France, and England. His impressions of this tour which extended over three years, he gave to the world, in his *Letters of a Russian Traveller*, translated into German by Richter in 1804, and from German into English. On his return home he devoted himself entirely to literature, contributing industriously to the *Moscow Journal* (of which many numbers were written wholly by himself), and afterwards to the *Aglaiia*, the *Pantheon*, and the *Vestnik Evrope*. The success of his poems and miscellaneous essays in these periodicals was due to their national character and interest. His aim was to magnify his country by dwelling on her past glories and rising greatness. Themes so flattering to the national vanity soon became popular with all classes of the Russian people, and were further recommended by the elaborate care and polish of their style. In 1803 his labours were rewarded with the sinecure office of imperial historiographer, and the resources thus placed at his command inspired him with the idea of writing the history of his country. The national archives were thrown open to him; the government aided him in his researches in every possible way; and the Czar himself countenanced the undertaking by telling him that "the Russian people well deserves to know its history—a history well worthy of the Russian people." To select judiciously from the vast mass of materials placed at his disposal was itself a work of immense care; and he taxed the whole powers of his mind to fuse these selections into a harmonious whole. For thirteen years he toiled with incredible industry at his task, and in 1816 the first eight volumes of the work were ready. The Czar himself defrayed the expenses of printing and publication. The praises of the book had been sounded in every corner of

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Kars.

the empire, and when it appeared it was eagerly welcomed by intelligent readers of every class. Its popularity was without precedent or parallel in Russian literature. Honours and rewards were heaped upon the author. He was made a councillor of state, and received from the Czar the order of St Anne, and a home in the Tauridian Palace, one of the pleasure-palaces of the Empress Catherine II. Continuing his task with renewed confidence, Karamsin had, in 1824, finished the eleventh volume, bringing down the narrative to the reign of Ivan V. Enfeebled health disabled him from carrying out his plans with his former energy, and he did not live to complete the twelfth volume, which was edited and carried through the press by his friend Bludov, minister of the interior. He died at the Tauridian Palace, June 3 (Russian style), 1826. A few days before his death, he had received from the new Czar Nicholas a flattering autograph letter, and a ukase entitling him to an annual pension of 50,000 roubles. The pension was continued to his widow and family.

Karamsin is with justice styled the father of Russian history. Neither before nor since his day has Russia had an historian worthy of the name. Judged by the standard of that country, Karamsin's history deserves all the praises that have been lavished upon it; tried by a higher standard it falls far short of them. Everywhere the style is stately and sonorous, often far too ambitious for the narrative or the thought. It does not flexibly adapt itself to the ever-varying importance of the persons or facts passed under review; and thus, to the foreign reader at least, it soon becomes wearisome from its monotony. In a historical point of view the matter of the narrative is also open to strong objections. The outlines of great characters and events are often feebly and vaguely drawn. The personages are not grouped, and the events are not marshalled, in such a way as to produce any powerful effect, or even to convey any definite idea to the mind of the reader. Salient points are missed, and points of very minor importance paraded in their place. No attempt is made to explain the causes or the consequences of events or the motives of the actors. The arrangement likewise is bad. With all these defects, however, Karamsin's work is still the only history of Russia.

KARICAL, a town of Hindustan, on the sea-coast of the province of Tanjore, 50 miles E. by N. from the town of that name. The surrounding territory produces rice and salt. Karical was granted to the French by the rajah of Travancore in 1739. The fort is built upon one of the branches of the Cavery, the mouth of which is so choked by a bank of sand, that it is only navigable for boats. In 1760 Karical was taken from the French by Colonel Monson. It has been frequently taken and retaken since that period by the contending parties, and was ceded to the French at the conclusion of the last war. E. Long. 79, 54., N. Lat. 10, 55. The population for town and territory is estimated at—Europeans 43, East Indians 71, natives 49,193; giving a total of 49,307.

KARNAK. See EGYP.

KARNATA, an ancient Hindu geographical division, which comprehended all the high table-land in the S. of India, situated above the Ghauts. The name has been transferred to the adjacent provinces on the sea-coasts of India, Carnatic, and Canara. In the remote period of Hindu history, Karnata existed as a powerful empire, which comprehended great part of the S. of India.

KARNTHEN. See AUSTRIA.

KARS, a fortified town on the frontier of Asiatic Turkey, in the province of Turkish Armenia, five days' journey from Erzeroum, seven from Batoum, and two from Gumri, in Russian Armenia; N. Lat. 40, 25., E. Long. 41, 10. Pop. about 2000 families. It lies in a loop of a cognominal river in an amphitheatre of rugged hills of black basalt, and is 4000 feet above the level of the sea. On a precipitous rock overhanging the town on the same side of the river is the

Kars. old castle, a massive building formerly the only defence of the place. The houses are mostly built of mud, although the surrounding hills furnish excellent stone, which has been turned to account in the better class of dwellings. There are no public buildings of importance, except the baths, four in number, and the mosques, of which there are twenty-four. The streets, like those of most Turkish towns, are narrow and dirty; and the people are squalid in appearance.

There are two suburbs without the walls, which may contain about one-third of the population of the city itself. That suburb known by the name of Ousta Kassi contains a population of about 500 Armenian Christian families, who are the most active traders in the town, and cherish strong Russian sympathies. With the exception of this Armenian quarter, the people are Mussulman Georgians, who have adopted a form of the Turkish language. Since their conversion to Islamism they have become mixed a good deal with Turks and Kurds. The latter people inhabit the mountains to the S.E., while the mountainous region to the N. is inhabited by a branch of the Georgian stock called *Laz*; the country itself is called Lazistan.

The town has no manufactures, and but little trade of its own; but as it is one of the stations for caravans travelling between Trebizonde and Western Persia, it has periodic recurrences of commercial activity. The interest which attaches to Kars arises wholly from the importance of its position as the key of eastern Asia Minor, and from the numerous sieges it has sustained. The castle was founded in 1586 by Amurath III. It was besieged in 1735 by the Persian conqueror Nadir Shah, who, though he utterly annihilated a relieving army of 100,000 Turks, was baffled in his attempts to take the town, and at last compelled to raise the siege. A few years later, the town fell into the hands of semi-independent chieftains, who set the Sultan at defiance. The Porte, however, compromised matters by acknowledging the title of one of these, Selim by name, and ever since his death the governor of the fortress has been nominated by the Sultan. In 1806 the Russians, under General Neswatoft, besieged Kars for the first time, but finding it stronger than they had anticipated, abandoned the attempt after a short blockade. In 1828 they again appeared before its walls, under the command of the celebrated Paskiewitsch, and after an obstinate resistance obtained possession of the town and fort. But the most famous of all its sieges is that of 1855. Under the command of General Williams, an English officer of artillery, assisted by a few Englishmen and Hungarians (among the latter of whom was the patriot Kmety), the Turkish garrison, about 17,000 strong, with scarcely any cavalry, held out against a Russian army under Muravieff of nearly 40,000, including 10,000 cavalry, for five months, amid incredible hardships. The blockade commenced on the 16th June, and, varied from time to time by skirmishes, and two attempts to gain possession of some detached forts, continued until all the Turkish cavalry was destroyed, and the garrison weakened for want of food, when a general assault was given on the 29th Sept. The Russians had calculated on taking the town by a *coup-de-main* in the early morning, but were foiled by the vigilance of the garrison. After a desperate engagement, which lasted for seven hours and a half, the Turks were left masters of the field. The Russians acknowledged the loss of 6300 men in this attack. On account of the utter want of cavalry, and the weakness, both physical and numerical, of the Turkish army, the Russians, having retired from the assault, were still able, by means of their numerous and untouched cavalry, to resume the blockade. The garrison was obliged at length to capitulate to their vanquished enemy, after having gone through such frightful sufferings that scarce two-thirds of the original numbers remained, and many of these expired after the

surrender, which took place on the 28th Nov. 1855. By the treaty of 1856 Kars was restored to the Turks. There are several good accounts of Kars. The best are Monteth's *History of Prince Paskiewitsch's Campaigns in Asia Minor*; *Narrative of the Siege of Kars*, 1856, by H. Sandwith, M.D., who was an eye-witness of the whole siege.

KASAN, a government in the eastern part of European Russia, lying between N. Lat. 54. 10. and 56. 45., and E. Long. 46. 20. and 51. 45., and bounded on the N. by Viatka, E. by Orenburg, S. by Simbirsk, and W. by Novgorod. Area 23,947 square miles. The surface is generally flat, with here and there ranges of low hills. In the S.E. are some long off-shoots of the Ural Mountains. The principal rivers are the Volga and the Kama, the former entering the government from the W., the latter from the E. They meet near the centre, and, uniting their streams, pursue a southern course into Simbirsk. Besides these, there are many smaller streams, and numerous lakes abounding in fish. The climate, although very severe in winter, is, on the whole, salubrious. The rivers are covered with ice from November to the end of March, but the rest of the year is mild, and apples, pears, cherries, plums, apricots, and other fruits, come to perfection in the open air. The soil is fertile, but agriculture is very imperfectly carried on. Sufficient crops of rye, wheat, hemp, flax, &c., are raised for home consumption. Extensive forests of pine, fir, and oak, occupy nearly one-half of the surface. Bears, wolves, and various kinds of game abound. Besides agriculture and fishing, the inhabitants find employment in the numerous distilleries, tanneries, oil and saw-mills, and potash works. Spinning and weaving are also common pursuits. Pop. (1851) 1,347,352, of whom about one-half are Russians, the rest being Tartars, Circassians, Chuvasses, &c.

The khanat, or kingdom of Kasan, was founded by the Tartars in 1441, and comprised the present Russian governments of Kasan, Pensa, Perm, Simbirsk, and Viatka. It was subjected to Russia in 1552.

KASAN, the capital of the above government, is situated on an elevated tongue of land formed by the Kasanka, and its tributary the Bulak, about 5 miles above the mouth of the former, in the Volga. It consists of three parts, the kremlin, the middle town, and the lower town. The kremlin is situated close to the steepest part of the bank, and is surrounded by a high stone wall built by the Tartars. It contains the governor's and archbishop's palaces, barracks, prisons and workhouses for criminals, and the highly venerated cathedral of the Kasan "Mother of God." In the part of the middle town which adjoins the fortress, the great size of the bazaar, and the grand appearance of some of the private houses near it, attest the rank which Kasan held at an early period. In the bazaar are seen immense piles of furs, vegetables and fruits both fresh and dried, fish, &c. The market-place is surrounded by lofty buildings for the most part of stone, and has recently been much improved in appearance by the planting of rows of trees. Many of the old churches here display elaborate execution, and some of them, perhaps, excel in this respect even those of Moscow. The lower town contains several rows of elegant houses, separated from one another by gardens, and inhabited chiefly by opulent merchants. The chief building here, however, is the university, an elegant structure of white hewn stone, having its principal fronts adorned with Corinthian columns. It contains a library of 30,000 vols., a fine collection of Russian and Tartar coins, scientific apparatus and collections, observatory, botanical garden, &c., and had, in 1854, 91 professors, and 366 students. The study of history and of the Eastern languages receive special attention here. The Tartars dwell apart from the Russians, having a settlement on the eminences which surround Lake Kaban in the vicinity. Kasan is the seat of various manufactures, as woollens, cottons, leather, soap, cutlery, &c., and carries on

Kasan.

Kaschau
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Kasmark.

an extensive transit trade between Siberia, Bokhara, and European Russia. The town has frequently suffered from fire—three times within a century after it came into the hands of the Russians; in 1552; and, more recently, in 1774, when the ancient archives were destroyed; in 1815, when the government powder stores exploded; and in 1842, when more than one-half of the city was destroyed. Pop. (1851) 45,049.

KASCHAU (Hung. *Kassa*, Lat. *Cossovia*), a royal free city of Hungary, finely situated at the confluence of the Hernad and Csermel, in the county of Abaujvar, 125 miles N.E. of Pesth. It is enclosed by vineyards, at an elevation of 1060 feet above the sea-level, in N. Lat. 48. 39., E. Long. 21. 16. The town, which is nearly oval in shape, is well built, its streets are regularly laid out, and it is adorned with squares, and handsome buildings. The cathedral, called Elizabeth-Pfarrkirche, with its copper-covered tower, and fine internal decorations, is as old as the middle of the fourteenth century, and is the best specimen of Gothic ecclesiastical architecture in Hungary. There are thirteen Catholic, and two Lutheran churches, besides the various government houses, bishop's palace, schools, museum, library of 10,000 vols., infirmary, theatre, and aristocratic mansions. The manufactures consist of leather, hats, tobacco, woollen cloth, paper, and gunpowder. There are quarries of stone and slate, and works for making tiles and bricks. The chief trade of Kaschau is in wine. The nobility and upper classes resort to the town in the winter time. Latin, as well as German, is spoken, and both in great purity. Pop. (1851) 13,034.

KASHGAR, or CASHGAR, *The Principality of*, forms the extreme eastern frontier of the Chinese empire, and reaches on the N. to the chain of snowy mountains. Marco Polo, who visited it towards the close of the thirteenth century, describes the country as fertile, and covered with towns, but the Chinese, who conquered it in 1759, describe the soil as poor. The inhabitants are covetous and frugal in their mode of living, amounting to 60,000 families, and inhabiting 17 towns, and 1600 villages and hamlets. It is now considered a fertile country, producing corn, wine, fruits, flax, hemp, and cotton.

The town of Kashgar, in the above, on a river of the same name, is the most westerly place of importance in the Chinese empire. It is situated in N. Lat. 39. 28., and E. Long. 73. 55., 140 miles N.W. of Yarkand, and 2300 W. of Pekin. The town, which is built of brick, is surrounded with an earthen wall pierced by four gates. The citadel is strongly garrisoned with Chinese troops. The part of the town not held by the Chinese is occupied by Mohammedans, and a few Nestorians. A considerable trade is carried on between Kashgar and Bokhara, the former affording silks, porcelain, rhubarb, and tea; while from the latter are imported woollen cloths, cloth of gold, velvet, mirrors, ploughshares, and various other articles of merchandise. The merchants of Kashgar are described as rich and luxurious, while the artizans are skilful in their various works and manufactures.

In ancient times Kashgar was called *Sule*, and is mentioned as having been an important commercial city before the Christian era. After being the residence of an independent prince, it fell into the hands of the Karakityan khans, then of the Jagatayan khans, and was captured by the Eluths towards the close of the seventeenth century. In 1759 it was taken by the Chinese, and during the first quarter of the present century it contained 10,000 houses, while its trade was estimated at upwards of 700 camel loads annually. But both its importance and its trade were diminished by the rebellion which broke out in 1826. Pop. 16,000, exclusive of the Chinese garrison of 8000.

KASMARK, a free town of Northern Hungary, county of Zips, on the right bank of the Poprad, 125 miles N.E.

of Pesth. It is an old-fashioned town, with three gates, but its walls have for the most part been removed. It has considerable manufactures of linen and woollen stuffs, and some trade by means of the river, which also affords good salmon fishing. Pop. 4500.

Kassimow
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Kattywar.

KASSIMOW, a town of European Russia, capital of a cognominal circle, in the government of Riazan, and 70 miles E.N.E. of the town of that name. It stands at the junction of the Rivers Babinka and Oka, and is surrounded by a wall which has been formed into a pleasant promenade. The houses are mostly of wood. It carries on a considerable trade with the East in furs, silk, and cotton goods; and has some manufactures of cloth, leather, earthenware, &c. Under Tartar rule, it was a place of some note, having been the capital of a prince of that race. Some of the original Tartar inhabitants occupy one of the suburbs. Pop. (1849) 7781.

KASTAMOUNI, or COSTAMBONE, a town in Anatolia, in Asia Minor, in N. Lat. 41. 22., and E. Long. 33. 55., about 230 miles E. of Constantinople, 115 miles N.N.E. of Angora, 50 miles S. of the Black Sea, and situated 2350 feet above the sea level. It stands in a dreary hollow, from which rises a solitary rock surmounted by a fortress in ruins. The houses are two stories high, but ill-built, and the streets are both dirty and narrow. The town contains 30 mosques, 4 monasteries, and 24 baths. The trade, which is considerable, consists in wool, copper, cotton, and sails for shipping. It is said there are 32 printing-houses for cotton, 22 dyeing houses, and 2 tanneries. During the Greek empire, the fortress was in possession of the Comneni. It was taken by Bajazet, retaken by Timour, and, lastly, conquered by Mohammed I. Pop. 48,000.

KATRINE, LOCH (i.e., Lake of the Caterans or Plunderers), one of the most celebrated lakes in Scotland, is situated in the S.W. of Perthshire, 9½ miles from Callander. It is about 10 miles long, 2 broad, and of great depth. It is surrounded with lofty mountains, of which the most prominent are Benvenue and Ben-a'an, the sides of which are indented with picturesque ravines and wooded dells. The lake is fed by the numerous torrents which come down from the mountains, and it discharges its waters through the wild pass of the Trossachs to join Lochs Achray and Venacher, which flow into the Teith. About half-a-mile from the shore is Eilan Varnoch, to which the plunderers used to drive their booty, and which occupies a conspicuous place in the *Lady of the Lake* as Ellen's Isle. Since 1846 a steamer has plied upon the lake, for the convenience of tourists.

KATTYWAR, a province of Hindustan, comprehending the whole of the peninsula of Guzerat, bounded on the N. and N.W. by the Runn and the Gulf of Cutch, on the S.W. and S. by the Arabian Sea, on the E. by the Gulf of Cambay and the British district of Ahmedabad. It is divided into twelve districts, which are again subdivided into the separate possessions of a host of Hindu chiefs, some of whom are tributary to the British government, others to the Guicowar. The Peishwa formerly claimed very considerable tributary rights in Kattywar, and the destruction of his power and sovereignty by the British transferred them to the latter. In this manner did the British government acquire superiority over part of the chiefs above mentioned; and it being found inconvenient that two authorities should exercise the power of levying tribute, all have been placed under the control of that government, by whose agency the entire tribute is now collected, the Guicowar's share being accounted for to that prince. The number of chiefs amounts to 216; their total revenue to L.450,172, of which L.104,739 is paid as tribute, leaving a residue of L.345,433. The chiefs are left in a large degree of independence. A criminal court has been established for the trial of more serious offences, through the agency of the British resident

Kavala
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Kean.

but the native chiefs of the several states sit therein as assessors. The area of the Kattywar is returned at 19,850 square miles, with a population of 1,468,900.

KAVALA, or **CAVALLO**, a seaport town of European Turkey, in the S.E. of Macedonia, opposite the island of Thasos in the Ægean Sea. It is surrounded by walls, and is farther protected by a citadel. The harbour is small, but a considerable trade is carried on, cotton and tobacco being the chief exports. Kavala was the birth-place of Mehemet Ali, the late Pasha of Egypt. Pop. about 4000.

KAYNS, **KIATNS**, or **CARIANERS**, a singular tribe who inhabit that mountainous and woody tract which lies between Bengal, Aracan, Ava Proper, and the province of Munipoor or Cassay. They are represented as a simple, innocent race, speaking a language distinct from that of the Burmans, and entertaining rude notions of religion. Their habits are altogether pastoral, and they are the most industrious subjects of the state. Their villages form a select community, from which they exclude all other sects, and in no case reside in any city, or marry or intermingle with strangers. They profess and practise the doctrine of universal peace, never engaging in war, nor taking any part in contests for dominion. They devote themselves to agriculture, the care of cattle, and the raising of poultry. Almost all the provisions used in the country are raised by this tribe, and they particularly excel in gardening. They have of late years been oppressed and heavily taxed by the great Burman landholders, and have in consequence withdrawn into the mountains of Aracan. They have no written laws, but are guided by immemorial custom, which stands in the place of law. Some learn to speak the Burman tongue, and a few can read and write it imperfectly. They are (says Symes, in his account of his embassy to Ava) timorous, honest, mild in their manners, and exceedingly hospitable to strangers.

KAZEROON, a town in the province of Fars in Persia, 60 miles W. of Shiraz, in N. Lat. 29. 35., E. Long. 51. 33. It is a strongly fortified place, situated in a fine valley, and stands 2800 feet above the sea level. It has manufactories for cotton, and carries on trade with Shiraz, and is a good mart for horses. Its population has dwindled down from 50,000 to 5000.

KEAN, **EDMUND**, one of the greatest of English tragedians, was a native of London. His biographers assign the November of 1787 as the date of his birth, while he himself maintained that he was born on the 17th of March, 1790. His parentage is equally dubious. Who his father was is quite unknown; his mother seems to have been a Miss Carey, a descendant of the reputed author of the *National Anthem*. When a mere infant he appeared on the stage in the shows and pageants of the fairy-pieces and pantomimes. As he grew up his taste for acting increased with his years, and by the time he was seventeen he had wandered over England, Scotland, and Ireland with a strolling company, and played in every character from Richard III. down to harlequin in the pantomime. He soon discovered that tragedy was his forte, and the flashes of genius with which he sometimes astonished his rustic audiences were taken by his fellow players as an earnest of future eminence. His readings in Milton and Shakspeare attracted the notice of Dr Drury, head-master of Harrow, who interested himself in the young actor's destiny, and sent him to Eton, where he studied, though with moderate success, for about three years. Again he resumed his wandering life, visiting the principal cities in the United Kingdom, and playing with increasing success in Shylock, Hamlet, Richard III., and other Shakspearian characters. In 1813 Dr Drury's influence secured him an engagement at Drury Lane, where he made his débüt, January 25 of the following year, as Shylock. The house was thinly attended, but he was applauded to the echo. The critics pronounced

Keats.

him the greatest tragedian of the age, and next morning, like Byron after the publication of *Childe Harold*, "he awoke and found himself famous." His Richard III., Othello, Sir Giles Overreach, and Zanga, gained him fresh laurels, and he was everywhere hailed as a worthy rival of the Kembles and their school. For several seasons his star continued to rise; and had his personal character corresponded at all with his professional eminence, he might have divided the honours and rewards of social life with the most respected actors of the day. But he was a man of no education, and in early life had contracted many vicious tastes and habits, which seemed to grow upon him with his years. Finding it necessary to quit England for a time, he visited America, and on returning he failed to reinstate himself in the high place he had once held. Dissipation and imprudence precipitated his fall, and finally destroyed his health, and on the 15th May 1833, he died a perfect wreck at Richmond, where he had latterly become manager of the theatre.

The genius of Kean was first fully recognised and insisted upon by Hazlitt. It was in all respects a complete contrast to that of the Kemble family, being impulsive, fiery, and startling. Though he played in a greater variety of character than Garrick himself, whom he resembled in the diminutive slowness of his person, the range of his real eminence was very narrow. The parts in which he excelled, Shylock, Richard III., Othello, Sir Giles Overreach, and Zanga, were probably never played as they were played by him; but in his most ambitious efforts, such as Brutus, Coriolanus, Hamlet, Lear, and Wolsey, he was left far behind by John Kemble. In his own walk, however, he has never had a rival. In the depth, the tragic force, the terrible intensity of his acting, he overleapt the barriers of art and training, and rose to heights which genius only could have dared.

KEATS, **JOHN**, was born in London on the 29th of October 1795. His father married the daughter of his employer, Mr Jennings, the proprietor of large livery-stables in Moorfields. The offspring of this marriage were George, who afterwards emigrated to America, John, Thomas, and a sister several years their junior. John at an early age was sent, along with his brothers, to Mr Clarke's school at Enfield, where the three boys distinguished themselves by their strong pugilistic tendencies and general fierceness of disposition. They fought with every school-fellow who felt inclined to gratify them; and when no foe was procurable they supplied the deficiency in the best manner they could by fighting with one another. This pugnacious spirit was, however, in John combined with a passionate tenderness; he gave way on the slightest occasion to hysterical bursts of laughter and tears; and when, after a lingering illness, his mother died, to whom he was fondly attached, he hid himself in a nook under his master's desk for several days, and gave himself up to uncontrollable grief. His career at school was not for some time particularly remarkable; he learned his lessons with ease and kept a respectable position, but did not seem desirous to outstrip his fellows. Suddenly his ambition awoke; he determined to carry off the prizes in literature as well as in boxing, and, by dint of energy and sacrificing to his studies his walks and even his half-holidays, he succeeded. During this burst of industry at Enfield he translated the twelve books of the *Æneid*. On the death of his father the family were consigned to the guardianship of Mr Abbey, a merchant, and a sum of L.8000 was left to be divided amongst them. Keats was designed for the medical profession, and after leaving school he was apprenticed for five years to Mr Hammond, a surgeon, at Edmonton. Living in the vicinity of Enfield, he still remained on terms of intimacy with the family of his former instructor, and found in his son Charles (since favourably known in litera-

Keats.

ture) a congenial and profitable companion. An ardent friendship sprang up between them; they walked together, talked together about the poets, and sometimes continued their readings of Chaucer and Spenser from evening till daylight. It was the study of the latter poet which seems to have first impelled Keats to original composition, and the influence of his favourite may be traced throughout all his productions. On the termination of his apprenticeship he removed to London for the purpose of walking the hospitals, and soon made the acquaintance of Mr Leigh Hunt, then editor of the *Examiner*, and subsequently that of Haydon, Hazlitt, Shelley, and others. Encouraged by the praise of his friends, he published his first volume, which, out of his own immediate circle, found few readers. The disease of his family beginning to manifest itself, he was advised to leave London, and while wandering about England—by his correspondence we trace him to the Isle of Wight, Margate, Oxford, and Canterbury—he was busy with the composition of *Endymion*. This, his first poem of any considerable length, was completed in November 1817, and published in the following year, with a very remarkable preface, exhibiting the earnestness with which he strove to perfect himself in his divine art, and giving utterance to a proud yet humble belief in his future fame. Its appearance was the signal for an assault in the *Quarterly* more than usually truculent, even in those days, when the reviewer wrote inflamed with political animosities, and when his pen was a tomahawk. *Blackwood's Magazine* in its turn emptied on the head of the poet all the vials of its wrath. Nothing was spared. His literary associates, his family, his private affairs, his profession, and even his name were made the subjects of the coarsest ridicule. Nor is this much to be wondered at. Keats had allied himself with a political party especially obnoxious to the Tories. Hazlitt and Hunt stank in the nostrils of Blackwood and the *Quarterly*, and their literary offences were equally unpardonable with their political ones. If the truth must be told, there was in the whole "Cockney School," as it was then called, a good deal of effeminacy and puerile sentimentalism. Hunt, its chief leader, was an apostle of cheerfulness and universal benevolence, and seemed to look upon fine scenery as only a more exquisite place for pic-nics. From their peculiar circumstances they lived very much in the society of one another; they "babbled of green fields," of streams, of flowers. They wrote sonnets to one another, sent one another bouquets of roses and baskets of fruit, they wreathed crowns of ivy and placed them on one another's foreheads. Although nothing could be calmer and nobler than the temper of Keats' mind, or more resolute than his purpose to cultivate himself to the utmost, he did not altogether escape the taint of weak sentiment. His first volume, although it contains one of the grandest sonnets in the language, and although the reader is every now and again delighted with fresh and unexpected beauties, is exceedingly crude and immature. The poet maunders about flowers and streams; he weeps for the mere delight he has in weeping, and disports himself in the strangest and uncouthest phraseology. *Endymion*, perhaps the richest poem in colour and music given to the world since the *Comus* of Milton, is far from being perfect. The reader is smothered in roses. The story is lost in ornament. You cannot see the string for the beads. The charm lies in single lines—seldom in linked and sustained passages. It is full of the same barbarous and dissonant diction, the same lax and nerveless versification, which disfigured his earlier productions. He still wrote in a style of babyish effeminacy about

"Plums

Ready to melt between an infant's gums."

These and lines of a similar nauseous sweetness are of the most frequent occurrence.

Keats.

Shortly after the publication of *Endymion*, Keats, accompanied by his friend and correspondent, Mr Brown, started on a pedestrian tour through the north of England and Scotland. His chief object was, of course, to re-establish his health, but he also hoped, by familiarizing himself with the stern and gloomy scenery of a mountainous region, to raise his mind to the proper elevation, and to furnish him with fit imagery for a story of the fallen Saturnian gods; for at this time he had already planned *Hyperion*.

The travellers, disappointed in meeting Wordsworth at the Lakes, bent their course to Scotland, where everything connected with the memory of Burns interested them; and it is characteristic of Keats that he made a point of writing a sonnet in the cottage where the great poet was born. They visited Ireland, but soon returned to Ayrshire, and pursued their course northwards, touched at Staffa and Iona, and penetrated as far as Inverness. From this point, a severe cold caught on the road and unfortunately resulting in inflammation of the throat, determined Keats to return to London. On his arrival he was shocked to find his younger brother at the point of death; he hurried down to Teignmouth, and brought the invalid to London, who, however, survived the removal only a few days. This event, in which the poet read a prophecy of his own fate, threw a deeper shade of despondency over his mind.

Immediately after his brother's death may be dated the beginning of the passion which throws such a tragedy over the closing months of his career. Calling on one occasion at a friend's house, he met a young lady, who, on account of some misunderstanding with her relatives, had come to reside there. Her beauty seems to have made an indelible impression on his mind. From her rich Eastern look he always called her "Charmain," and wrote to his brother George, then in America, "When she comes into the room she makes the same impression as the beauty of a young leopardess." Her name, and the wildest reference to her, are constantly appearing in his correspondence, and towards the close of his life the remembrance of her love and beauty, and his inexorable disease, seems to have burned up his very existence. In the fierce alternations of passion, in failing health, and harassed by pecuniary difficulties, he was busily engaged in the study of *Paradise Lost*, filling his ear with the organ-music of Milton, and preparing his last volume for the press, containing his odes on the "Nightingale" and the "Grecian Urn," the poems of "Lamia," "Isabella," the "Eve of St Agnes," and the fragment of "Hyperion." In the midst of his labours he returned home late one night in a state of great excitement. He said he had been on the stage-coach, and had been chilled by the night air. He was persuaded to go to bed, but had scarcely laid down when he coughed, and said, "Bring me a candle." A light was brought, he looked at the dark stain on the white pillow for a few moments in silence, his surgeon's knowledge told him the fatal truth, he turned to his friend, and said calmly, "I know the colour of that blood, it is arterial blood, I cannot be deceived in that colour. That drop is my death-warrant, I must die." Getting rapidly worse, he was advised to winter in a more genial climate; and, in the autumn of 1820, Keats, accompanied by his friend Mr Severn the artist, whose name will be for ever famous in the annals of friendship, sailed for Italy. In the Bay of Biscay they experienced a severe storm. "Water parted from the sea," said Keats, as a wave deluged the cabin. When he reached Naples his sufferings were aggravated by a ten days' quarantine. Goaded by disease, and his own thoughts, he hurried to Rome, where every kindness and attention were shown him by Dr Clarke (now Sir James); and Mr Severn was never absent from his bedside day nor night. While at Rome, Keats suffered much from want of sleep, and would rave about his beloved

Keats. friends in England, of the happy hours he spent in their society, but chiefly about *her*. Once in a moment of good spirits, and when full of merry talk, he was seized with a paroxysm of coughing, and vomited a large quantity of blood. He never rallied after. One night he told his friend, he wished this inscription to be placed on his gravestone, "Here lies one whose name was writ in water." On the 23d of February he started from sleep crying, "Severn—I—lift me up—I am dying—I shall die easy—don't be frightened—be firm and thank God it has come." He was lifted up, "the phlegm boiling in his throat," his agony shortly after decreased, and he died quietly as if in slumber. After his death his body was opened, his lungs were found completely gone, and his physicians expressed their surprise that he should have lived so long. He was buried in the Protestant cemetery. "Enough to make one in love with death," says Shelley, "to think that one should be buried in so sweet a place." Many of the English residing in Rome at the time followed Keats to his grave.

After Chatterton, Keats is the most extraordinary phenomenon in our poetic literature; and, had life been granted him, there is reason to believe he would have taken his place in the very first rank of English poets. Misunderstood at the time, and supposed by many to be a sentimental weakling, oppressed by adverse circumstances, and bowed down by a mortal disease, his mind was of the noblest strain. His ambition was lofty, but he duly estimated his own powers and the difficulties he had to encounter; he shrunk from no labour, and gathered ardour from defeat. Those who are accustomed to consider him a poetic visionary,—who turned from the realities of life to shed melodious tears over morning roses, and to fall into unnatural extasies at the sight of beautiful women, will be surprised to find in his letters warm human sympathies, practical sense, clear judgment, a considerable knowledge of mankind, and a healthy contempt of everything mean and degrading; they will see the sun of a strong intellect, rising out of the coloured mists of fancy and sentiment, consuming them in its path, and will be led to form the highest anticipations of the day which would have followed, had not the luminary been arrested by the hand of death just when it emerged full-orbed above them all.

The advance from *Endymion* to *Hyperion*, taking into consideration the shortness of the time in which it was accomplished,—about three years,—is without a parallel in our literary history. The glorious and uncultured profusion of the earlier poem is displeasing to a pure taste, from its very flush of colour and excess of sweetness. All form and outline are lost in the exuberance of ornament. In his latter poems, *Hyperion* especially, he had learned to husband his strength, and had acquired that last gift of the artist, to know where to stop. There is no excess, nothing extraneous, everything is clear and well-defined, as the naked limbs of an Apollo. He had overcome, too, the fopperies of style, the taste for conceits and fantastical diction so characteristic of the poets amongst whom he lived, and which so often marred the beauty of his earlier performances, and had gained a noble simplicity, and a pomp and depth of music which seems caught from the "far-foamed sea sands." One could hardly have expected that the florid and luscious fancies of *Endymion* should have ripened into the terrible power which gave us the picture of the fallen gods, stretched here and there on the flinty rocks, and veiled with everlasting twilight,—

"Their clenched teeth still clenched, and all their limbs
Locked up like veins of metal cramped and screwed."

The same wonderful artistic sense is exhibited in the *Eve of St Agnes*. It is rich in colour as the stained windows of a Gothic cathedral, and every verse bursts into picturesque and graceful fancies; yet all this abundance is so subdued

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and harmonized in such wonderful keeping with the story Kedarnath and the mediæval period, as to render it a perfect chrysolite—a precious gem of art. Perhaps the most exquisite specimen of Keats' poetry is the *Ode to the Grecian Urn*; it breathes the very spirit of antiquity,—eternal beauty and eternal repose.

In one of his letters, Keats gives utterance to the hope, that "after his death he would be among the English poets." This anticipation has been abundantly verified. Even in his lifetime the tide had turned in his favour. The late Lord Jeffrey, in 1820, after regretting that his attention had not been earlier turned to the book, remarks, that "*Endymion* is, in truth, at least as full of genius as absurdity;" and concludes, "We are very much inclined, indeed, to add, that we do not know any book which we would sooner employ as a test to ascertain whether any one had in him a native relish for poetry, and a genuine sensibility to its intrinsic charm." With but one or two exceptions, no poet of the last generation stands at this moment higher in the popular estimation, and certainly no one has in a greater degree influenced the poetic development of the last thirty years. (A. S.—H.)

KEDARNATH, a celebrated place of Hindu pilgrimage in Northern Hindustan, situated in the mountains of Gurwhal. Those who perform this difficult pilgrimage have to travel over the most steep and inaccessible roads, which, during half the year, are blocked up with snow. The place lies about 14 or 15 miles of direct distance W.N.W. of Bhadrinath. The ceremonies observed here are nearly the same as at other places of Hindu ablation. The most peculiar of these is that of the widows shaving their heads, having previously bathed and purified themselves in the Ganges, which is here a narrow stream. N. Lat. 30. 44., E. Long. 79. 17.

KEDGELEE, a town of Bengal, situated near the mouth of the Hooghly, where ships frequently stop either in entering or going out of the river. The river here expands to a breadth of nearly 9 miles across. It is esteemed healthier than Diamond Harbour. The first section of telegraphic communication in India extended from this place to Calcutta, a distance of 40 miles. Lat. 21. 53., Long 88.

KEDJE, or KEDGE, in Beloochistan, the capital of Mekran, is situated on the Mooleanee River, in N. Lat. 26. 20., E. Long. 62. 15. It is defended by a strong fortress on an eminence, on three sides of which the town is built. It once contained 3000 houses, and carried on considerable trade, which has fallen off since the Khan of Kelat ceased to protect commerce.

KEELING, or COCOS ISLANDS, a group in the Indian Ocean, in S. Lat. 12. 5., E. Long. 96. 53., consisting of a circular chain of small coral islands, enclosing within them a spacious harbour called Port-Albion. Those islands, of which the chief are Horsburgh and Keeling, are inhabited by Malays and a few English, and covered with numerous cocoa nut and other trees. They were discovered by Keeling in 1609.

KEFIL, a village of Irak Arabi, held in peculiar veneration both by Jews and Mohammedans as the tomb of the prophet Ezekiel, and hence a frequent resort of pilgrims. It is 14 miles S. of Hillah.

KEHL, a town in Baden, on the right bank of the Rhine, where that river is crossed by a bridge of boats, situated in N. Lat. 48. 36., E. Long. 7. 52., and directly opposite Strasburg. It was at one time a bulwark of Germany, and, having been taken by the French, was fortified by Vauban. It has been frequently taken and retaken since, but now the fortifications are dismantled. The inhabitants are employed mostly in the transit trade. Pop. 1500.

KEIGHLEY, or KEITHLEY, a market-town in the West Riding of Yorkshire, situated in a deep valley, near Black-

Keith
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Kelat.

stone Edge, on a little stream which runs into the Aire, 44 miles W. of York, and 204 from London by the Great Northern and Midland line. Although containing many fine stone houses, yet, as a town, it is not regularly built. The parish church, a large handsome building, occupies the site of one erected during the time of Henry I. The living, which is a rectory, is in the power of the Duke of Devonshire. There are also places of worship for the Independents, Methodists, Wesleyans, Baptists, Quakers, and Swedenborgians. Keighley has a neat court-house, a mechanics' institute, a market-place, a library, a savings bank, and several national schools. The manufactures consist of coarse stuffs, merinos, and worsted yarns. The various mills employ upwards of 2000 people. The canal which joins this town with Hull and Liverpool affords a cheap means of transit for goods. Market-day, Wednesday. In 1645 Keighley was the scene of a battle between the royal and parliamentary forces. Pop. (1851) 13,050.

KEITH, a market-town in Banffshire, 20 miles W. of Banff, situated on the Isla, and consisting of three villages, Old Keith, New Keith, and Fife Keith, all surrounded by hills. Old Keith is very ancient, irregularly built, and mean in appearance; New Keith contains a market-place, a parish church, an Episcopal and a Roman Catholic chapel, and meeting-houses for other denominations, a court-house, several branch banks, libraries, and schools. Fife Keith, connected with Old Keith by two bridges, is a finely built village, and dates from 1816. The inhabitants are engaged in weaving and bleaching, and also in manufacturing woollens, linens, and tobacco. Before the introduction of railways Keith was the chief starting point for cattle-dealers going to the south. At Old Keith the forces of the Pretender, in 1745, gained an advantage over the Royalists. In the neighbourhood Ferguson the mechanical philosopher was born. Markets weekly. Pop. (1851) 2101.

KELAT, a city of Asia, the capital of Beloochistan, and thence called Kelat, or the city. Its situation is elevated on the western side of a well-cultivated plain or valley, about 8 miles in length and 2 or 3 in breadth, the greater part of which is laid out in gardens and other enclosures. The town is built in the form of an oblong square; three sides of it are encompassed by a mud wall 18 or 20 feet high, flanked at intervals of 250 paces by bastions, which, as well as the wall itself, are pierced with numberless loop-holes for matchlock-men; but no cannon are now mounted. The defence of the fourth side of the city is formed by the western face of the hill on which it is built, being cut away perpendicularly. There are within the walls 2500 houses, without the wall, 1250. They are built of half-burnt brick or wooden frames, and plastered over with mud or mortar; the streets are broader than those of native towns, and have mostly a raised pathway on either side for foot passengers, and an uncovered kennel in the centre, which is a recipient for all filth, and dirt, and stagnant water. The upper storeys of the houses also stretching across the streets, render the part beneath them gloomy and damp. The palace of the chief of Kelat stands on the summit of the hill on which the city is built. Viewed from the outside, it appears an irregular heap of common mud buildings, with flat roofs, forming terraces, protected by low parapet walls pierced with loop-holes. The quarter on which the khan's residence is erected has been enclosed by a mud wall with bastions. The bazaar of Kelat is extensive, and well furnished with every kind of goods, and with provisions of all sorts, which can be procured at a moderate rate. The town is also supplied with delicious water, from a spring in the face of a hill on the opposite side of the plain, whence it meanders through the centre of it. The inhabitants of Kelat may be divided into four classes, namely, the Beloochees or Brahoos, Hindus, Afghans, and Dehwars. The latter are the principal merchants of the place, and are therefore encouraged

Kelat
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Kellermann.

by the chief. On the invasion of Afghanistan by the British in March 1839, Mehrab Khan, the ruler of Beloochistan, was considered to evince such hostile feeling towards the British, as required that he should be chastised, and rendered incapable of future mischief; and in the following November, on the return of the Bombay column from Cabul to Scinde, Major-General Willshire was detached from Quetta against Kelat. One of the gates was knocked in by the fire of the horse-artillery guns which accompanied the force, and the town and citadel immediately stormed, the Khan being killed fighting sword in hand, and with him above 400 of his troops; nearly all the rest, amounting to about 2000, were made prisoners. The British force on this occasion consisted of 1261 men. Their loss was 31 killed and 107 wounded. In the following year, a weak garrison of sepoys was overpowered by some insurgent Beloochees, who made themselves masters of the town, deposed the chief placed in power by the British, made prisoner the British officer in command, and subsequently put him to death. In the close of the same year, the place was retaken by General Nott. In 1841 the British government recognised as ruler Nasir Khan, the youthful son of Mehrab Khan, and subsequently withdrew their troops from his dominions. The population of the town and suburbs is about 12,000. Lat. 28. 52., Long. 66. 29.

KELAT, or *The Fortress*, is a singular valley in the province of Khorassan, in Persia, which extends, in a direction nearly E. and W., from 50 to 60 miles in length, and from 12 to 15 in breadth, situated amongst the hills that divide the plain of Mushed from the desert. It is surrounded by mountains so steep and difficult by nature as to be almost impassable, and they have been rendered completely so by art. The rocks, says Fraser, are scarped in the outside, presenting a mural appearance, so that there is no possibility of scaling them; and beyond these is a lesser range, with a hollow between, which the natives call the ditch. Not less care has been taken in the inside to increase every natural difficulty, so as to render a descent into, or an escape from, the valley equally impracticable. There are two openings in this valley, one at the western and one at the eastern extremity. These openings, which are both narrow and intricate, are called the *gates* of the fortress, and have been built up and fortified in such a manner that it is impossible to force an entrance. On these fortified gateways there are towers where watchmen are continually posted to give warning of all who approach, and none are admitted except those who have passed from the end of the valley. In this valley there is a great deal of cultivation, and its population amounts to 2000 families. It was in this stronghold that Nadir Shah intended to deposit his vast treasure. Futeh Allee Khan was placed in command of the fortress by Allee Shah, after the death of Nadir, and was killed in a brawl which subsequently took place. His son succeeded in putting the murderer to death, and he has ever since retained possession of the fortress. He is an independent chieftain, possessed of 1000 horse and 2000 foot, and can considerably increase the number by arming his villagers. As he is, besides, on good terms with the Turkomans of the desert, he can always command a large force of their cavalry.

KELLERMANN, FRANÇOIS-CHRISTOPHE, Duke of Valmy, one of the most distinguished generals of the French Revolution, was born at Strasbourg in 1735. Choosing the career of arms, he rose slowly through the various grades, and when the Revolution broke out he obtained a command in the army of the Moselle. The Duke of Brunswick, with an army of 60,000 Austrians and Prussians, was then advancing towards the French frontier, and the raw levies of the republic were vastly inferior, both in number and discipline, to his well-trained warriors. Success at first attended his manœuvres, and Kellermann was cut off from

the main body of the French under Dumouriez. By forced marches he effected a junction with the commander-in-chief on the 19th September 1792; but taking up a position different from that which had been assigned to him, he found himself on the following morning on the plateau of Valmy, "projected like a cape into the midst of the lines of the Prussian bayonets." In this position the French maintained a desperate struggle during the whole day, and being reinforced at night by Dumouriez, they drove the Prusso-Austrian troops from the field. The victory of Valmy is memorable as the first of that great series of victories achieved by the arms of revolutionary France. Goethe, who was present during the engagement, told the troop to which he was attached, "From this place, and from this day forth, commences a new era in the world's history; and you can all say that you were present at its birth." Professor Creasy has given Valmy a place among the fifteen decisive battles of the world. The victor of that day afterwards rose to still higher commands in the French army, and, in 1795, became general-in-chief of the armies of the Alps and Italy. Under Napoleon, he rose to be a peer and senator of the empire; and when the Bourbons were restored, he continued to retain office under them. He died in 1820; and, in accordance with his last wishes, his heart was buried in the field of Valmy, the scene of his greatest triumph.

KELLS (originally *REULIS*), an ancient market-town and municipal burgh, county Meath, Ireland. It is pleasantly situated on the Blackwater, 36 miles N.W. of Dublin, but is, for the most part, meanly built and dirty. Amongst the antiquities of the town and neighbourhood are the old church, a round tower 99 feet high, a richly carved cross, and some remains of a monastery, said to have been founded by Columba in 550. In the neighbourhood is the seat of the Marquis of Headfort. Pop. 3997.

KELP. See *GLASS*, § *Manufacture of Crown Glass*.

KELSO, the county town of Roxburghshire, Scotland, is picturesquely situated at the confluence of the Tweed and Teviot, 23 miles S.W. from Berwick. The general aspect of the streets is clean and agreeable; and the market-place, a spacious square in the centre of the town, has a highly respectable appearance. Towering above the modern edifices are the majestic ruins of the abbey, founded by David I., and demolished by English invaders in 1545,—one of the noblest extant relics of the early Norman style. Over the Tweed is a handsome bridge by Rennie. Kelso is well furnished with schools and libraries, and has two newspapers. It was the first provincial Scottish town that could boast of a printing press. The manufactures are unimportant. Shopkeeping and agriculture are the main sources of employment. There is a weekly corn-market, and the principal fair in the S. of Scotland, St James' Fair, is held here in August. In the vicinity is a fine race-course. About a mile from the town, on a commanding eminence, are the ruins of the once strong castle of Roxburgh, fronting which, to the N., is the magnificent modern residence of the Duke of Roxburgh, *Fleurs Palace*. Two miles to the N. is the village of Ednam, the birth-place of the poet Thomson. Pop. 4783.

KEMAON, or **KUMAON**, a district of Northern Hindustan, which was formerly a Hindu principality, contiguous with that of Duti on the E., the boundary line being the Cali River. On the W. it was separated from Gurwal by the Ramgunga, and extended a considerable way into the plains of Bareilly. The modern district of Kemaon, as it has been regulated by the British since its conquest in 1815, comprehends the whole tract of country between the Aluknunda and the Cali, from the plains to the highest pinnacle of the Himalaya, which space includes a large portion of the Gurwal province S.E. of Alcananda, whilst the Cali River on the E. forms a natural and well-defined boundary towards Nepal. The geographical divisions are

Kemaon Proper, and British Gurwal, within the limits of which latter is the Pass of Niti, supposed to have been the earliest and most frequented route into Chinese Tartary. Area 7000 square miles.

Kemaon is situated amongst the lower ranges of the Himalaya Mountains. It is separated from the lower districts of Bareilly and Morabad by a thick forest of nearly two days' journey, which surrounds the whole and skirts the margin of the mountains. The soil is marshy, and the atmosphere, during two-thirds of the year, is more pestilential than that of the Sunderbunds; it is, says Heber, "a literal belt of death, which even the natives tremble to go near, and which, during the rains more especially, the monkeys are forced to abandon. After the middle of November this is dry, practicable, and safe." Kemaon Proper is separated on the N.W. from the province of Gurwal by a range of mountains, which, in point of ruggedness, presents a contrast to the hills of Kemaon. These latter appear to rise in a regular gentle acclivity from their bases; and the soil is fertile, consisting of rich earth, which gives nourishment to fine verdure and extensive forests. The hills are also intersected by rather spacious valleys, rendered fertile by tillage; and the cultivation is more extended, and carried farther up the hills, than in Gurwal with a denser population. In these valleys, rice is produced in abundance, and the cultivator is thus in a manner rendered independent of the seasons, as the numerous mountain-streams, descending in every direction, enable him to irrigate all the lower lands. The higher lands produce wheat, barley, and various small grains, which being raised in a redundant quantity, form an article of traffic with Bhutant. There are several passes into Kemaon from the districts of Bareilly and Morabad, but those leading through Cossipoor and Roderpoor are considered as the best, and are most frequented. The first leads by Chilkeah, where an annual fair is held, to which the hill people resort in great numbers. Similar meetings also occur at Bhagesur, on the banks of the Cali, each continuing ten days, and are frequented by merchants from Bhote and the low countries. Chilkeah is one of the principal marts of trade in Kemaon, and through that country into Thibet and Tartary. The article which meets with the readiest sale is cloth with distinct colours on each side. European articles of a coarse quality are also in demand, such as knives, razors, wine-glasses, tumblers, spying and looking glasses, spectacles, and cheap enamelled watches; and Bishop Heber also saw exposed to sale English cloths and Eastern shawls of good appearance, with many other serviceable and valuable commodities. The greatest staple that is exported from this southern frontier has always been timber, found in the immense forests already mentioned, which skirt the border. Here the saul forests are of great extent, and produce some of the best timber of that species in India. Owing to the difficulty of access, it is necessary to convert the trees into planks on the spot, that they may be the more easily transported to the populous parts of the country. In some parts they have to be carried down a perpendicular height of 500 feet. The fir-tree grows to an immense size, and it is much stronger than the firs of Europe, and as heavy as teak, the grain strong and full of turpentine. Some of the trees have from 60 to 70 feet clear of branches, and the spans are from 20 to 23 inches in diameter. Rosin, turpentine, doedwar, oil, and hemp of an excellent quality, are to be found among the Kemaon Hills. The bamboo, though small, grows remarkably tough, and seems to gain consistency and soundness from a certain degree of frost. The same is said to be the case with the plantains. The tea-plant grows wild all through Kemaon, but cannot be made use of, from an emetic quality which it possesses. The upper mountains produce copper, lead, iron, and the Panar River gold, but there is no mine of consequence. The northern parts are

Kemaon. cold, and yield pasture for numerous flocks of sheep; and in summer a considerable intercourse is carried on with the country subject to China.

The towns and villages of Kemaon, when viewed from a distance, present a neat appearance. But a nearer approach does not confirm these favourable prepossessions. They are generally surrounded by dirt and filth; though Bishop Heber mentions, that the town of Almorah is very neat, with a natural pavement of slaty rock, which is kept beautifully clean. He mentions, however, of the peasantry, namely, the Khasyas, that, near Almorah, though they are honest, peaceable, and cheerful, they are dirty to a degree which he never saw amongst the Hindus, and extremely averse to any improvement, using their women ill, and employing them in the most laborious tasks. These people are rigid Hindus. The houses are generally constructed of large masses of stone, roofed with slate, and of two stories in height, the lower story being allotted to cattle. Their poverty is extreme, their food consisting of coarse cakes made from the grain of a kind of holcus, in which the flour, bran, and husk, are mixed together, and baked, or rather scorched, on the fire. In other parts, however, as he advanced farther among the hills, Bishop Heber saw tolerably neat and comfortable cottages, the people better fed and clothed than most of the Khasyas. Polygamy is common among the lower classes.

Wild animals abound in the mountains and forests of this country. The tiger is found, quite up to the glaciers, of size and ferocity undiminished. There are also lynxes, and bears are common and mischievous throughout the province. Though they do not, except when pressed by hunger, eat flesh, preferring roots, berries, and honey, yet, as if out of capricious cruelty, they often worry and destroy passengers. The chamois is not uncommon in the snowy mountains, but scarce elsewhere; and the hares are much finer and larger than those in Hindustan, and not much inferior to those of Europe. The musk-deer is also found in the highest and coldest parts of the province, and the neighbouring countries of Thibet and Tartary. It cannot, says Heber, even bear the heat at Almorah. In like manner, the yak or mountain ox of Tartary droops as soon as it leaves the neighbourhood of the ice. The shawl-goat will live, but its wool degenerates. On the other hand, English dogs, impaired by the climate of the plains, improve in strength, size, and sagacity, amongst the mountains; and it is remarkable that, in a winter or two, they acquire the same fine short shawl-wool, mixed with their own hair, which distinguishes the indigenous animal of the country. The same is in some degree the case with horses. Flying squirrels are also common amongst the colder and higher parts of these woods. Some of the marmots, of the alpine kind, also abound in the neighbourhood of the snow. A singular species of wild dog is mentioned as a native of these hills. In form and fur these animals resemble a fox, but they are much larger. They hunt in packs, give tongue like dogs, and possess a very fine scent. They make great havock of the game amongst the hills, and even attack and destroy the tiger, overpowering him by their numbers. Of birds, the vulture is to be found of a remarkable strength and size. Eagles are numerous, and very large and formidable; and these birds do much injury to the shepherds and goatherds, and sometimes carry away the poor naked children of the peasants. Their nests being in the remote glaciers, and among inaccessible crags, there is no possibility of destroying these dangerous animals. There are larks in Kemaon, not very different from the English, as well as quails, partridges, pheasants, thrushes, &c. A little bird resembling the robin, and the goldfinch, are found at the foot of the snowy mountains.

This country, though, from its elevation, the climate is colder than in Hindustan, with ice and snow in winter, is

remarkably unhealthy, from a certain malaria which prevails in all the lower valleys, especially during and after the rainy season, and which gives rise to ague, intermittents, and fevers, which assume the appearance of typhus, and under which the powers of life decline more rapidly, though often not more surely, than under continued fits of the ague. Several of the inhabitants seen by Bishop Heber in this devoted region, he describes as singularly wretched; the fever and the ague destroying all their energy, and preventing them from adopting the simple means of dry and well-raised dwellings, and sufficient clothing, to support life and health. "They are," says the intelligent traveller already quoted, "a very ugly and miserable race of human beings, with large heads, and particularly prominent ears, flat noses, tumid bellies, slender limbs, and sallow complexions, and have scarcely any garments but a blanket of black wool, though most of them have matchlocks, swords, and shields." The chief region of insalubrity is at the foot of the lowest hills, where a long, black, and level line of forest extends, though the mountainous country is also more or less unhealthy in all the low valleys. The fatal malaria is described as prevailing from the middle of March to the middle of October. "No one," says Mr Hodgson, "can traverse this region without feeling that the pestilence is generated by the undue and almost exclusive prevalence of vegetable exhalations in the atmosphere." There is no free ventilation, and the forest and lesser hills are absolute wildernesses of rank vegetation. Yet it is worthy of remark, that in this pesthouse, from which all mankind flee during eight months of every twelve, constantly reside and are bred some of the mightiest quadrupeds in the world. The tiger, elephant, and rhinoceros abound; and these malarious regions nourish also the *Python bivittatus*, and other huge creatures of this order.

This country was acquired by the British government in 1815, when its limits were extended to the westward by the annexation of a portion of Gurwal, E. of the Alcananda. Prior to this, it was ruled by military chiefs, who owned a nominal allegiance to Nepal, though they were nearly independent within their own territories. They were extremely tyrannical, and not only divided the lands amongst themselves, without regard to the rights of the ancient proprietors, but, on any arrears of rent, sold the wives and children of the peasants as slaves, to an amount almost incredible, whilst they quelled every murmur among the people by the most barbarous severity. The court of Nepal issued repeated edicts against the practice, but without effect, since most of the young persons who were of a marketable age were sold into slavery, when the British, to the great joy of the inhabitants, who gave them every possible aid, acquired possession of the country. Since this period uninterrupted tranquillity has prevailed, which may be partly ascribed to the peaceable and orderly habits of the people, and to the general popularity of the British government. The revenue of the country has been fixed at 154,794 rupees for Kemaon Proper, and at 68,644 rupees for the annexed districts of Gurwal; and, as a proof that the assessment is moderate, it has been punctually realized, and has even been paid in many instances in advance.

The population of Kemaon Proper is estimated at 166,755; that of Gurwal, E. of Alcananda, is yet more considerable. Almorah, the chief town is in Lat. 29. 35., Long. 79. 42.

KEMBLE, JOHN PHILIP, one of the greatest tragedians that England ever produced, was born on the 1st of February 1757, at Prescott, in Lancashire. Mr Roger Kemble, his father, though only the manager of a provincial company of actors, was of ancient and respectable family; and, sensible of the disadvantages attending his own profession, sent his son to receive his education at a Roman Catholic seminary, for the purpose, it is believed, of qualifying him to take orders in the Catholic church.

Kemble.

Kemble.

He was also a student for two or three years at the College of Douay; but the strength of natural bias prevailed, and he became an actor in 1776. After performing in York, Liverpool, Manchester, Edinburgh, Dublin, and other places, and gradually acquiring reputation, he made his first appearance before a London audience on the 30th of September 1783, in the character of Hamlet. He was received by the public generally with great applause, although, as always happens in such cases, a party lagged behind, preferring and paying greater homage to a favourite idol of longer standing. He rapidly attained an acknowledged pre-eminence in the tragic scene, and took that decided lead which he ever afterwards maintained. In 1790 he became manager of Drury Lane Theatre, which he conducted, with only a slight interruption, till 1801; and during that period he did much to reform the morals and raise the character of the stage. In 1794, he brought out a musical piece of his own, entitled *Lodoiska*, which was very successful at the time, and is still occasionally performed. He likewise revived old pieces of merit, and brought forward many new productions, some of which were of considerable merit, altered by himself. In 1802 he visited the Continent; and, on his return to London, purchased for £24,000 a sixth share of Covent Garden Theatre, and became manager of that establishment. His career in this place was brilliantly successful, but partially suspended in consequence of the total destruction of the theatre by fire in 1809. A new edifice, however, was speedily reared, and opened with an increase of entrance-money, which, along with certain arrangements regarding the private boxes, created a series of disturbances, known by the name of O. P. riots. These lasted for sixty-six nights, and only ceased when the public carried their point. Kemble stood the storm with firmness; but during the whole of that period he never showed himself on the stage without being grossly insulted. In 1812 he retired for two years, conceiving he had done his part, and being desirous of repose. His return to the stage was hailed with the utmost enthusiasm. He rose to the summit of popularity, and was acknowledged, without dispute, as the first actor in Britain, probably in the world. His health, however, began to give way; and he formed the resolution of taking farewell of the stage, which he did on the 23d of July 1817, after performing, with unabated power, his great character of Coriolanus. The "Valedictory Stanzas" addressed to him at a public meeting held in that month, do equal honour to the actor, and the poet Mr Campbell; and Sir Walter Scott composed the "Farewell Address" which he delivered on taking leave of the Edinburgh stage in the month of March preceding. He retired to the Continent, and fixed his residence at Lausanne, where he died on the 26th of February 1823.

In judging of the talents of Kemble, we must regard him in the threefold character of actor, manager, and stage-reformer. In reference to the first, tragedy,—and that of the most stately and majestic character,—was the line in which he excelled. His person was on a scale suited to the stage, being tall and stately; his countenance, in nobleness of expression, resembled the finest models of the antique; and his movements and demeanour, at once majestic and graceful, corresponded to the heroic cast of his form and features. The grand characters of republican Rome,—Coriolanus, Cato, Brutus,—were those to which he was led, both by nature and by choice; but he was no less powerfully effective in Macbeth, King John, Wolsey, Lear, Hamlet, Jacques, and Penruddock. The memory of his triumphs in these and many other parts is still fresh in the hearts of thousands, among whom it is not an uncommon remark, that another Shakspeare may appear, sooner than another Kemble. The personal character and influence of Kemble consummated the work of stage-reform which Garrick had begun. Austerely correct in his own morals, he enforced

the same high standard on all connected with the theatres which he managed. A student and a scholar, he was a welcome guest at the tables of the highest persons in the land; and his success in social as well as professional life gave a character to the British stage such as it never enjoyed before or since his day. He turned his learning to account in reproducing the exact costumes and manners of the age to which every piece belonged, and correcting the ridiculous anachronisms which had crept upon the stage. His taste was shown in the correctness and splendour of the scenic decorations, on which he bestowed much care and expense. His life, by his friend Boaden, 2 vols. 8vo, 1825, is a well-meant, though very inadequate monument of his fame.

KEMPIS, THOMAS A', the reputed author of the *De Imitatione Christi*, was born about the year 1380 at Kempen, near Cologne. His family name was Hämmerchen or Hämmerlein (in Latin, *Malleolus*), but he always called himself from his birth-place. Destined from an early age for the church, he was sent to receive the necessary training in a school at Deventer, belonging to the Brethren of the Common Life (*gemeines Lebens*). In his twenty-second year he joined the monks in the convent of St Agnes, near Zwoll, of which his brother, John à Kempis, was prior. After a novitiate of six years, he took the monastic vows, and remained a canon in the convent for the long period of sixty-five years. He died in 1471, at the advanced age of ninety-two. The greater part of his life seems to have been spent in transcribing books of devotion. One Bible in four folio volumes is mentioned which cost him fifteen years to copy and illuminate. His transcript of the famous essay on the *Imitation of Christ* has given rise to a controversy as to the authorship of that work, which has been keenly maintained, and is still as far from being decided as ever. Besides A' Kempis, two other candidates have been brought into the field, whose claims have been warmly advocated by their respective partizans. These are Jean Gerson, chancellor of the University of Paris, and Jean Gersen, whose supporters describe him as abbot of a monastery at Vercelli in the thirteenth century, while his opponents deny his existence altogether, and pronounce his name to be a corruption of Gerson's. The authorities for each opinion are pretty equally balanced. German and Flemish writers, countenanced by the Sorbonne, contend stoutly for A' Kempis; the French are equally zealous for their distinguished countryman; while the claims of Gersen are upheld by the most learned of the Benedictines. In favour of A' Kempis has been urged the testimony of many editions bearing his name, one of which is dated 1471, besides the wide-spread and generally accepted tradition which has ascribed the work to him ever since his own time. Against him, on the other hand, it is urged that he was merely a calligrapher or copyist; that the *Chronicle of St Agnes*, a contemporary work, makes no mention of his having written the *Imitation*, and that its name is not found in an early list of the works attributed to him. In support of Gerson are brought forward a great number of French and Italian editions, belonging to the fifteenth and sixteenth centuries, one of which bears date of Venice 1483. Gersen's claims are based on a very ancient MS., which ascribes the authorship to him directly, while he has the benefit of all the manuscripts held to be older than the times of Gerson and A' Kempis. The internal evidence furnished by the book itself is equally conflicting. On the one hand, the Gallicisms are very numerous, and such as could hardly have occurred to any one whose native tongue was not French. On the other hand, the whole spirit that breathes throughout the work is that of a solitary ascetic, who places the rule of life in absolute seclusion from the world, and seldom refers to the exercise of any social or domestic duty. As the first of these testimonies decidedly strengthens the case of Gerson, the second

Thomas à Kempis.

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is equally conclusive against him, for the greater part of his life was spent in active duty as Chancellor of the University of Paris, and head of the Gallican church. Of late years, however, his claims have been very keenly pressed by the French critics, among whom Gence and Daunou are conspicuous; the former in various articles in the *Biographie Universelle*, and the latter in the *Journal des Savans* for 1826-1827. It may be doubted, however, if the controversy either will or can ever be settled. The work itself, which has been the subject of so much debate, has been often translated into the various European tongues, though it may be doubted if any of the versions can vie in expression with the concise and energetic, though somewhat barbarous Latin, original. It is calculated that it has now gone through 1800 editions, and that it has been more read than any other book except the Bible. With a deep knowledge of human nature and of the world, it breathes a spirit of the most refined and lofty devotion, while many isolated sentences are memorable for their beauty and heart-piercing truth. (See Hallam's *Liter. of Europe*; *Biog. Univers.*; Barbier's *Dissertation*; Napione's *Dissertation*; Ullmann's *Reformers*, &c.; Ersch u. Gruber's *Encyclopædie*, &c.)

KEMPTEN (*Campodunum*), a town of Bavaria, circle of Suabia, is situated on the Iller, 50 miles S. of Augsburg. It consists of an old and new town; the former in the valley, walled and inhabited by tradespeople, the latter, called the Stifts-stadt, on the height, formerly the seat of an abbot, who was lord of the town and surrounding territory. Its chief manufactures are linen, cotton, and woollen stuffs. On the neighbouring eminence of Hilarment are the ruins of a fortress supposed to be Roman. Pop. about 8000.

KEN, THOMAS, bishop of Bath and Wells, was born at Berkhamstead, in Hertfordshire, in July 1637. From Winchester School, to which he was sent at the age of thirteen, he went to New College, Oxford, and there became a probationer-fellow at the age of twenty. In 1666 he was chosen fellow of Winchester College, and afterwards became successively domestic chaplain to Bishop Morley, rector of Brixton, in the Isle of Wight, and in 1669, prebend of Westminster. In 1674 he started with his nephew, Isaac Walton, upon a tour to Rome, and, upon his return, after five years of absence, took his degrees in divinity. Having been appointed chaplain to the Princess of Orange, he went to Holland, and on his return to England, was appointed chaplain to Lord Dartmouth, in the expedition to Tangier. In 1684 he became chaplain to Charles II., whom he closely attended during his last illness, speaking to him, according to Burnet, "with great elevation of thought and expression, and like a man inspired." Charles, shortly before his death, had nominated Ken to the bishopric of Bath and Wells, and after some delay he was fully invested in his episcopal functions after the accession of James II. In 1685 appeared his *Exposition of the Church Catechism*, and *Prayers for the Use of the Bath*. Zealous in his attachment to the Church of England, he did not shrink from pointing out, even in the chapel-royal, the danger of a coalition with the sectaries. On the other hand, he was no friend to Popery, for the attempts made by the court to gain him over were unsuccessful; and when the king, having assumed the dispensing power, ordered the declaration of indulgence to be read, Ken openly opposed it, and, along with six others, was sent to the Tower. Still he considered James his lawful sovereign, and after the Revolution, when the Prince of Orange ascended the throne as William III., he would not transfer his allegiance to the new monarch. In consequence of this refusal he was deprived, and retired to Longleat, in Wiltshire, where he died on the 19th March 1711 at the age of seventy-four. A small pension settled on him by Queen Mary was his chief means of sup-

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Kenilworth.

port during his latter years. A collective edition of his works, consisting of sermons, charges, and poems, was published in 1721, in 4 vols. 8vo. His prose works, and much of his poetry, have passed into oblivion; but his hymns, which breathe a spirit of lofty and resigned devotion, have fixed themselves in the hearts and memories of the English people, and will never be forgotten.

Intellectually and morally, Ken stood highest among the nonjuring prelates. He was a man of solid and extensive learning, refined taste, and wide sympathies. While in office, he laboured with an apostolic zeal and self-devotion. His high sense of duty was shown in the readiness with which he relinquished wealth and station, and retired into obscurity and poverty, rather than forego his principles. The tenderness and humanity of his nature were strikingly displayed in his kindness to the victims of the Monmouth rebellion,—many of them personal, and all of them political enemies,—whom he helped from his private resources with no sparing hand.

KENDAL, KIRKBY-KENDAL, or KIRKBY-IN-KENDAL (the Kirk-Town of Ken Dale), market-town and parliamentary borough, county of Westmoreland, is situated in a pleasant valley, on the E. bank of the Ken or Kent, 50 miles S. of Carlisle. The general appearance of the place is agreeable—a long line of white walls and blue-slate roofs, rows of poplars, neat stone bridges, background of hills, and in the distance, up the valley, the high summits that overlook Kentmere. Its position is probably the main cause of its being one of the most rainy places in England. On a steep eminence to the E. are the ruins of the castle of the Kendal barons, of which only four broken towers, and the outer wall surrounded by a deep fosse, remain. It was here that Queen Catherine Parr was born, and her remains are interred in the parish church. Facing Kendal Castle on the W. is the Castle-How, or Castle-Law-Hill, an ancient mound encircled by a ditch and rampart, and surmounted by an obelisk of modern erection in commemoration of the Revolution of 1688. Kendal has been noted for its woollen manufactures since the fourteenth century, when a colony of Flemish weavers settled here by the invitation of Edward III. The manufacture of green cloth seems to have acquired considerable reputation before Shakspeare's time, who speaks of

"Three misbegotten knaves in Kendal green."

To the branches of industry connected with these manufactures, several others are now added, as marble cutting, currying, &c. The town is respectably supplied with educational and literary institutions, and publishes two weekly newspapers. By the Reform Act, which disfranchised Appleby, Kendal returns one M.P. Dr Thomas Shaw, the celebrated traveller, was born here in 1693. Pop. 11,829.

KENEH, or GIENEH (*Cænopolis*), a town of Upper Egypt, on the N. bank of the Nile, nearly opposite the ruins of Denderah. It is the principal entrepôt of the Arabian trade by way of Cosseir, and is one of the stations for the great pilgrim caravan from West and Central Africa. Passengers to and from India sometimes travel by the Nile, passing through Keneh instead of going by Suez. The place is celebrated for its manufacture of porous water-jars, &c., which are floated down the Nile in rafts.

KENILWORTH, a small town of Warwickshire, nearly equidistant (5 miles) from Warwick, Leamington, and Coventry. The only interest of the place centres in its ruined castle, which stands on a rocky and commanding eminence. This castle, formerly one of the most extensive and majestic baronial edifices in England, was founded by Geoffrey de Clinton, Lord Chamberlain and Treasurer to Henry I. It was granted by Henry III. to Simon de Montfort Earl of Leicester, and became the chief rallying-

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point of the insurgents who sided with that noble. After his death, it held out for six months against the royal forces. It was the scene of a splendid tournament in the time of Edward I., and here his successor was confined before his removal to Berkeley Castle. In the reign of Edward III. it passed into the hands of John of Gaunt, who made large additions to it. Under his son Henry IV. it reverted to the crown, and so continued till it was conferred by Queen Elizabeth on her favourite Leicester, who expended immense sums in enlarging and adorning the building. Elizabeth visited Kenilworth three times, and on the occasion of her last visit (1575), was entertained in a style of unparalleled magnificence. (See Sir Walter Scott's *Kenilworth*.) After Leicester's death, the castle was seized by the crown. It was dismantled in the time of Cromwell, and thenceforth abandoned to decay. Since the Restoration it has belonged to the house of Clarendon. The only remnant of the original fortress is the Keep, "Cæsar's Tower," the walls of which are in some places 16 feet thick. The more modern portions have suffered most from the ravages of time.

KENMARE, a market-town of Ireland, county of Kerry, Munster, at the head of Kenmare Bay, 15 miles S.S.W. of Killarney. The town is neatly built, having one wide street, from which several smaller ones diverge. It has a large Roman Catholic chapel, handsome parish church, newsroom, bridewell, and workhouse. The bay is crossed by an elegant suspension bridge, and a little below the town is a pier affording sufficient depth of water for vessels of large burden. Chief exports, corn and salmon. Pop. (1851) 1501.

KENMORE, a parish and village of Perthshire, in the district of Breadalbane, embracing some of the finest scenery in Scotland. See PERTHSHIRE, and TAY.

KENNET, an English river, rising in the Wiltshire Downs, flowing through Wiltshire and Berks eastward, by Avebury, Marlborough, Hungerford, Newbury (where it becomes navigable), and Reading, below which it joins the Thames, after a course of about 50 miles. The vale of Kennet, from Newbury to Reading, is one of the most fertile districts in England. The Kennet is celebrated for its trout, and its eels are commemorated by Pope:—

"The Kennet swift, for silver eels renowned."

KENNET, WHITE, bishop of Peterborough, a learned antiquarian, historian, and theological writer, was born at Dover in 1660. Educated at Westminster School, and afterwards at Oxford, he became at an early age rector of Amersden, with a prebend in the church of Peterborough. In 1691 he returned to Oxford as tutor and vice-principal of Edmund Hall, where, among other pupils, he numbered the famous antiquary Hearne. In 1700 he resigned Amersden, and removed to London, where he was presented with the living of St Botolph, Aldgate. In the following year he was made Archdeacon of Huntingdon; and at a later period, Dean of Peterborough. In 1718 he received, as his last preferment, the bishopric of Peterborough, which he retained till his death in 1728. Two years after his death a detailed biography of him was published by the Rev. W. Newton, rector of Wingham in Kent.

According to his biographer's account, Kennet was a man of great mental activity, "of incredible diligence and application, not only in his youth, but to the very last." Besides his published works, which amply confirm this testimony, his autograph MSS., now preserved in the British Museum, furnish decisive proof. In the religious controversies of the day he took a keen and active part; indeed, his biographer admits that his party zeal was carried to excess. Identifying himself with the Low Church party, he opposed the Sacheverell movement with all his might, and afterwards, when the Bangorian controversy broke out, he being at that time dean of Peterborough, fought with so much ar-

dour on Hoadley's side, that he believed his chances of church preferment to be totally ruined. His zeal in these and other disputes, sharpened by a strong temper and strong passions, raised many bitter enemies against him, by whom he was sometimes very roughly handled. A colour was given to the outcry against him, from his having been thought in early life to have had High Church leanings. His funeral sermon on the first Duke of Devonshire, in which he was charged with having sacrificed some of the fundamental points of religion to his own ambition, was also brought up against him; but he was too useful and too able a controversialist to be given up by his party.

Kennet's principal works are his *Parochial Antiquities attempted in the History of Ambrosden, Burcester, and other adjacent parishes in the counties of Oxford and Bucks*, 1695, 4to. In 1706 appeared a *Compleat History of England*, 3 vols. fol. The third of these, bringing down the narrative from Charles I. to Queen Anne, was written by Kennet. In 1698 he had published an edition of Sir Henry Spelman's *History and Fate of Sacrilege*, which six years later he followed up with his own *Case of Impropriation, and of the Augmentation of Vicarages, &c.*, a department of church administration which he had much at heart. His other works were for the most part occasional sermons, and controversial pamphlets. The value of most of these fell with the occasion which called them forth, and they are now interesting only to the antiquary.

KENNICOTT, BENJAMIN, an eminent Hebrew scholar, was born at Totness in Devonshire in 1718. At an early age he was appointed to succeed his father as teacher of a charity school in his native town. His precocious talents and learning interested some rich friends in his behalf, and by their kindness he was provided with the means of studying at Oxford. Entering himself of Wadham College in 1744, he soon distinguished himself in Hebrew and Divinity; and, while still an undergraduate, published two essays, *On the Tree of Life*, and *The Oblations of Cain and Abel*. These popular treatises came to a second edition in 1747, and procured for their author the degree of B.A. free of expense, and also a year before the usual time. He was soon afterwards chosen fellow of Exeter College, and in 1750 took the degree of M.A. Continuing to pursue his studies peacefully at Oxford, he was, in 1767, made keeper of the Radcliffe Library, and, a few years later, rector of Mynhenyote in Cornwall. This, though a very valuable living, he subsequently resigned, finding himself without time to do duty in person, and having scruples of conscience against doing it by deputy. In 1770 he was made prebend of Westminster; a preferment which he soon exchanged for a canonry in Christ Church, Oxford. He died in 1783, after a lingering illness, at the age of 65.

Kennicott's great work is his edition of the *Hebrew Bible*. To prepare the way, he published in 1753 an essay *On the printed Hebrew Text of the Old Testament*, the object of which was to overthrow the opinion at that time received by many eminent divines, and at one time held by Kennicott himself, that the Hebrew text was absolutely correct, that it agreed with the MSS., and, as a consequence, that the MSS. agreed with each other except in very trifling cases. In some religious communities a belief in the Divine authority of what is known as the Masoretic text was required as an article of faith from those entering the ministry. The question was obviously to be decided by an appeal to the Hebrew MSS. themselves, and in this important work Kennicott led the way in those laborious researches which have resulted in the collation of many hundreds of Hebrew MSS. Kennicott undertook to show that the MSS. which had been supposed to agree with each other, and with the printed text, contained numerous and various readings, which tended to support the authority of the ancient versions; and he announced the existence of six Samaritan

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MSS. of the Pentateuch in the libraries of Oxford, from which not only the printed Samaritan, but even the Hebrew text might be corrected. It was to be expected, from what we have already said of the state of feeling on the subject of the integrity of the Hebrew text, that the position assumed by Kennicott would be strenuously attacked, and we find the names of Rutherford, Warburton, and Bishop Horne, among his assailants. Nevertheless, by many eminent and learned men in his own country, as well as abroad, he was considered to have established his point. In 1760, seven years after his First, appeared his Second Dissertation on the state of the printed Hebrew text. In this treatise he defended the Samaritan version of the Pentateuch, and showed that the Chaldee paraphrase had been wilfully corrupted; he gave a history of the Hebrew text from the time at which the canon of the Old Testament was completed to the invention of printing; and produced a catalogue of 110 Hebrew MSS. in the British Museum, Oxford, and Cambridge, as well as a collection of 11 Samaritan MSS. Considerable interest had by this time been excited regarding these MSS., and a desire was extensively felt by divines, and the learned generally, to have the subject fully investigated. Accordingly, Dr Kennicott published a proposal that subscriptions should be raised to defray the expenses of a complete collation of all accessible MSS. at home and abroad. The list of subscribers was headed by King George III., and in a short time nearly L.10,000 were raised—an unprecedented amount for a literary purpose. For nine years the work of collation was actively conducted by eminent men employed for the purpose, Kennicott himself examining the MSS. of Great Britain and France, while Professor Bruns examined those of Germany, Switzerland, and Italy. Sixteen Samaritan, and upward of six hundred Hebrew MSS. were either wholly or in part collated between 1760 and 1769, an annual statement being furnished by Kennicott regarding the progress of the work. Several years more elapsed before all the materials were properly arranged, and, when ready for press, they extended to 30 vols. folio.

His great work bears the title *Vetus Testamentum Hebraicum, cum variis Lectionibus, Edidit Benjaminus Kennicott, S.T.P., Oxoniæ, 1776-1780, 2 vols. folio.* The text followed was that of Van der Hooght, with which the MSS. had been collated; the points, however, were omitted. *The Dissertatio Generalis*, prefixed to the second volume, contained a history of the Hebrew text from the time of the return from Babylon to the invention of printing, along with an account of the Rabbinical works and MSS. which he had consulted. The poetical books were printed according to the metrical laws of parallelism as established by Lowth. The various readings were printed at the foot of the page with references connecting them with the texts from which they differ, while the Samaritan variations were placed in a column parallel with the Hebrew itself.

To this work of Kennicott, a valuable supplement was published by De Rossi at Parma, 1784-87, 4 vols. 4to.; but a more commodious work, containing a selection of the more important various readings collected by Kennicott, De Rossi, and others, was published by Doederlein and Meissner at Leipsic, 1793, 8vo. A more correct edition, on the same plan, was published by Jahn at Vienna, 1806, 4 vols. 8vo. This again has been followed by the editions of Boothroyd, Judah d'Allemant, and others.

A full account of Kennicott's edition of the Hebrew Bible is given in the *Monthly Review* (O. S.), vols. lv., lxiv., lxv., and in Marsh's *Divinity Lectures*, part ii.

KENT, a maritime county in the N.E. of England, bounded on the N. by the estuary of the Thames, on the E. and S. by the English Channel, on the S.W. by the county of Sussex, and on the W. by the county of Surrey. The name is supposed to be Celtic, signifying a corner or projection (as the same word in Cantyre evidently denotes);

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and this name aptly describes the position occupied by Kent on the map of England. The extreme length of the county is, from Deptford to the North Foreland, W. and E., 63 miles; and the extreme breadth, from the North Foreland to Dungeness, N. and S., 40 miles.

The geological character of the county exhibits five parallel belts, occupied by different formations, and running E. and W. The first belt consists of the soil extending from the estuary of the Thames to the foot of a range of hills called the North Downs, and is occupied by the London and plastic clays; but with this variation, that, while the plastic clay overlies the chalk for the most part, the London clay overlies the plastic clay in the Isles of Sheppey and Grain, and in a large district extending from the sea-shore at Reculver and Whitstable S. to Canterbury. The second belt consists of the North Downs, a range of chalk hills which enters the county from Surrey, near Westerham, and extends to the coast near Folkestone. The range varies in breadth from 3 to 6 miles; and its greatest elevation, Haltingbourne Station, is 616 feet above the level of the sea. The third belt consists of a tract of chalk, marl, and greensand, cropping out of the North Downs, and varying in breadth from 2 to 7 miles. The marl and greensand lie in strips, the latter being the widest, and the southern slope of the belt forms what are called the "Ragstone Hills," overlooking the valleys of the Bealt, the Eden, and the Medway. The fourth belt consists of the Weald clay, and extends throughout the county from the borders of Surrey to Romney Marsh, with an average breadth of 5 miles; the clay is sometimes intermixed with thin beds of sand. The fifth belt consists of a range of hills occupying the remainder of the county and bordering on Sussex, amongst which the Medway and other rivers rise; it is occupied by iron sand. It will be seen, then, that the county presents two valleys, known as the Homesdale and the Weald, and three ranges of hills, succeeding each other from the banks of the Thames to the border of Sussex. Singularly enough, however, most of the rivers, though they rise in the southernmost part of the county, instead of finding outlets into the English Channel to the E., traverse the county, cutting the ranges of hills, and fall into the Thames on the N. This imparts a broken and irregular appearance to the surface. Dr Lyell, in describing the Weald, has given a graphic picture of the central portion of the county. "I shall suppose," he writes, "the reader first to travel southwards from the London basin. On leaving the tertiary strata he will first ascend a gently inclined plane, composed of the upper flinty portion of the chalk, and then find himself on the summit of a declivity, consisting for the most part of different members of the chalk formation; below which the upper greensand, and sometimes also the gault, crop out. This steep declivity is called by geologists 'the escarpment of the chalk,' which overhangs a valley excavated chiefly out of the argillaceous or marly bed termed gault. The escarpment is continuous along the southern termination of the North Downs, and the reader may trace it from the sea at Folkestone westward to Guildford and the neighbourhood of Petersfield, and from thence to the termination of the South Downs at Beachy Head. In this precipice or steep slope the strata are cut off abruptly, and it is evident that they must originally have extended farther. . . . The geologist cannot fail to recognise in this view the exact likeness of a sea cliff; and if he turns and looks in an opposite direction, or eastward, towards Beachy Head, he will see the same line of heights prolonged. Even those who are not accustomed to speculate on the former changes which the surface has undergone, may fancy the broad and level plain to resemble the flat sands which were laid dry by the receding tide, and the different masses of chalk to be the headlands of a coast which separated the different bays from each other."

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The rivers of the county are—the Medway, the Stour, the Darent, the Cray, the Ravensbourne, and some minor streams. The Medway is a noble stream; its trunk and branches cover 30 square miles of the surface of the county, and its length is nearly 60, of which 40 are navigable. The river well deserves the name of “Vaga,” by which the Britons described its wanderings; the Saxons added the syllable *med*, the sign of middle, because the river runs through the centre of the county, and thus it gets its present name of Medway. The river has four heads—one rising in Surrey, in the parish of Bletchingley; two in Sussex, at Waterdown Forest; and one in Kent, at Goldswold in Great Chart. The highest branch, which enters the county from Surrey, flows by Eaton Bridge and Hever Castle, and being constantly swelled by the brooks which drain the higher part of the weald of Sussex, it becomes navigable on reaching Penhurst. Here it separates into two branches for a mile, and is joined by the Eden, one of its main branches, which rises above Godstone in Surrey, and receives the drainage of the valley that separates the green-sand hills from the central iron-sand high lands in the Weald. From Penhurst the stream rolls on to Tunbridge, separating into five channels above that town, and reuniting into one just below it. From thence proceeding to Twyford Bridge, it receives the waters of two of its sources,—one rising in Sussex, the other in Kent,—and rolls on to Yalding in the Weald, where it is joined by the Teyse and the Bealt; and from thence to Maidstone, where, by means of a lock, erected in the reign of George II., at Allington below that town, the river has been rendered navigable as high as Penhurst. From Allington, where the river meets the tide, it flows on with many a mazy fold, and amidst magnificent scenery, to Rochester, becoming there a noble tidal river. A fine stone bridge of six arches crosses it at this city. The Medway next reaches Chatham, where a fleet of war ships “repose on their own shadows” in its land-locked waters, awaiting the time of action. The stream now widens its surface, and its rapidity frets the land into several islands, of which the island of Sheppey is the largest; and while one part of its waters escape into the open sea through the Swale channel, the main stream enters the Thames at Sheerness, the seat of a second naval arsenal. The Stour, a name supposed to be derived from “Es Dwr,” the water, has two branches, known as the Greater and Lesser Stour. The Greater Stour has two sources, which flow from opposite directions; one from Lenham in the N.W., the other from near Hythe in the S.E., and after each has flowed ten miles, they unite at Ashford, and proceed to Canterbury, where the stream becomes navigable. Farther on at Starre, the river separates into two branches, one of which falls into the estuary of the Thames near Reculver, and the other into the English Channel at Pegwell Bay. Thanet being situated between the arms of the Greater Stour, is therefore an island, and in former times was insulated from the rest of Kent. A thousand years ago the arms of the Stour formed a channel 3 or 4 miles wide, which was called the Wantsume, and shipping used it as late as the reign of Henry VIII., to avoid the delay and danger of doubling the North Foreland. The channel has, however, gradually filled up with silt; and the mischief was completed by erecting flood-gates to irrigate the adjoining land with its waters. The Lesser Stour rises at Liminge near Hythe, flows along the edge of Barham Downs, and, after running parallel with the Greater Stour, falls into that arm of it which joins the sea at Pegwell Bay. The Darent rises at Westerham on the border of Sussex, flows by Shoreham, Farningham, and South Darent, and from thence to Dartford, where it becomes navigable for small craft, and falls into the Thames at Long Reach. The River Cray rises at Oppington, flows by several villages which take their names from it, and falls into the Darent at Dartford Creek. The

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Ravensbourne rises on Keston Downs, flows between Hayes and Bromley, by Lewisham to Lee, where it is joined by the Leeburne, becomes navigable at Deptford Creek, and there falls into the Thames. The Rother rises in Sussex, to which county it properly belongs, though it is one of the streams which insulate Oxney Isle, forming the continuation of Romney Marsh; it is navigable in all that part of its course which touches Kent. Finally the great Thames may be considered one of the rivers of Kent, as it forms the northern boundary of the county, and empties itself into the sea on its coast.

The coast line of the county may be described as commencing at Gravesend, where the River Thames widens into an estuary. From thence to the channel of the Swale, it is broken into the islands of Graine, Sheppey, Elmley, and Harty, which are marshes insulated by the arms and creeks of the Thames and Medway. Graine is so low, that it is necessary to defend the soil by strong embankments, but the sea face of Sheppey is formed by chalk cliffs from 80 to 90 feet high. Cliffs of sand and clay succeed from the east bank of the Swale to the western limit of the Isle of Thanet, and here the chalk cliffs recommence, and extend to the North Foreland, the eastern extremity of the county, and from thence S. to Pegwell Bay, where one arm of the Stour forms the limit of the Isle of Thanet in that direction. The coast line sinks from Pegwell Bay to Walmer near Deal; and here commence the tall white cliffs of chalk from which England has obtained its name of Albion. These extend round the South Foreland to Sandgate, and from thence the coast-line falls to the level of Romney Marsh, a great part of which is below the level of the sea, and is protected from overflow by a massive embankment called Dymchurch Wall. The coast from the Isle of Sheppey to the North Foreland is skirted by sands and flats, which prevent ships of any size from approaching it. On the eastern coast, at from 3 to 7 miles from the shore, lie the Goodwin Sands, which, while they are a dangerous obstacle to the navigation of the Straits of Dover, serve as a breakwater to the roadstead of the Downs, which is indeed created by them. This anchorage is about 8 miles long and 6 wide; it is sheltered from the E., W., N.W., and partially from the N., and is a celebrated rendezvous for ships outward and homeward bound. The sea is gradually eating away the coast line of Kent, with the exception of that part formed by Romney Marsh, which has been recovered from the sea. Fifty acres of land on the cliffs of the island of Sheppey have disappeared within twenty years, and it is calculated that the whole of the island will be lost in a century. Nearly 100 yards of land have been lost at Reculver since 1780, part of the churchyard has been swallowed up, and the church, now abandoned, would also have been washed away, if a breakwater had not been constructed to deprive the waves of their force. Bedlam Farm, in the Isle of Thanet, is gradually diminishing in extent, and the far-famed Shakspeare's cliff at Dover is losing its height, the slope being towards the land. The cliffs are, in short, disappearing at the rate of from 2 to 3 feet every year. The Goodwin Sands, according to tradition, were a part of Kent, which was overwhelmed by the sea in 1097, when it belonged to the estate of Goodwin, Earl of Kent, a famous chieftain of his time. This is supported by the fact, that a bed of blue clay underlies the sand at a depth of 15 feet; but, on the other hand, many geologists and antiquarians incline to the opinion that, instead of land having been converted into sea, these sands were laid bare by a terrible inundation in the reign of William Rufus, when the drowning of Flanders and the low countries on the opposite side of the Channel, lowered the level of the sea in the narrow strait separating England from the Continent. It is a familiar expression, “Tenterden steeple is the cause of Goodwin Sands;” and, though

Kent. it is generally used to ridicule false reasoning, nevertheless, according to tradition, it is the truth. Time out of mind, we are told, money was collected throughout the county to maintain the banks of the land against the sea; but no damage having been done for many years, the Bishop of Rochester, in whose hands the money had been placed, spent it in building Tenterten steeple. A storm arose afterwards and swallowed up the land; and thus, though the old man who said, "The Goodwin Sands were firm land before Tenterten steeple had been built," was laughed at in his own time, and has furnished reasoners with a sarcasm for eight centuries, he was right after all. Geologists generally agree in the opinion that England was originally a part of the continent of Europe, the British Isles being fragments broken off by an irruption of the sea, similar to that which, in the thirteenth century, separated Friesland from Holland. De la Beche, however, contends that the separation was not caused by a violent movement, but by the gradual action of the sea. Certain it is, that the opposite cliffs of Kent and France are of chalk, having a remarkable resemblance in their contour, and that a chain of rock extends, at a depth of 14 feet below the low water line, from Folkestone to Boulogne.

There is not a single good harbour, at least one that ships can enter at all times of the tide, along the whole coast of Kent. The harbours usually consist of piers projecting from the land, and are dry at low water. The Strait of Dover, however, is the great artery of our foreign commerce, and Kent is the water-gate of England; to provide, then, for the safety of navigation and the great stream of passengers constantly pouring between England and the Continent, artificial harbours have been formed at Folkestone and Dover.

The climate of Kent is, on the whole, mild, pleasant, and healthy. Lambarde, a writer of the sixteenth century, quaintly tells us, indeed, "The air is bad in winter, worse in summer, and at no time good; fit only for those vast herds of cattle which feed all over it." Though this may have been true in the days of the writer, it is untrue in our own. Now that cattle are no longer free denizens of the soil, that the ground is cultivated, that marshes have been drained, and that the laws of health are known, the climate is mild and genial. The N.E. winds, too, sweeping over the Continent, absorb the superabundant moisture of the low grounds. Cranbrook, it has been demonstrated, is one of the healthiest places in the kingdom; and medical experience, and longevity amongst the inhabitants, testify almost as highly of the whole county. The coast is dotted with towns, the population of which is made up of persons seeking, and, as we may suppose, finding health there. The mineral waters of Tunbridge, on the western side of the county, have long been celebrated for their health-giving properties; and, though the influence of fashion has created many rivals, it is still the resort of a large number of invalids and pleasure-seekers.

The soil of the county, to speak generally, consists of clay, chalk, and gravel, which, when mixed, produce an exceedingly fine loam. Clay predominates; indeed, the county belongs geologically to the great clay basin of which London is the centre. No part of the kingdom, however, exhibits within such a limited compass so great a variety of soils, and, in consequence, so many modes of cultivation and production.

For the purpose of agricultural description, Kent may be divided into eight districts. The first of these is the Isle of Thanet, in the N.W. angle of the county, containing 23,000 acres of arable land, and 3500 of pasture. The soil is a light mould, on a chalky bottom, highly enriched by seaweed and other manure obtained from the shores, and there is scarcely an acre of waste in the district. The produce consists of wheat and beans, which are grown with-

out fallow or intermission, and of canary, mustard, spinach, and other seeds; and in order to preserve the latter from birds, trees and hedgerows are not suffered to exist. The second district comprises the sheep downs and upland farms which surround Canterbury, extending to Dover on one side, and Ashford and Rochester on the other. The soils here are very dissimilar; some being heavy loamy clay, with flint stones on the surface, others being stiffer, while the whole rests on a subsoil of chalk. All kinds of grain are grown, and the harvest is usually a fortnight later than in the Isle of Thanet. The third district comprises a rich sandy loam, in the neighbourhood of Sandwich, Faversham, and Deal, producing, in addition to the ordinary crops, a large quantity of apples. The fourth district extends from Maidstone to Sandwich, including Canterbury, and may be called the garden of Kent. In this district hops, apples, and cherries are the chief produce. The soils on which the hops are grown differ materially; one, locally called stone-shalten, is mixed with many small portions of sand and stone, and rests upon the Kentish ragstone, which is burned into excellent lime; others, and these are the most productive, have a deep loam surface, with a subsoil of deep loamy brick earth, and are mixed with a large number of flint stones. The fifth district is the Isle of Sheppey, 11 miles long and 8 broad, and separated from the rest of the county by the Swale, a navigable arm of the sea. Four-fifths of this district are either marsh or dry pasture land; the arable land, of which there are about 10,000 acres, is highly productive, especially of wheat. The soil is a heavy clay, enriched with the cockle-shells found on the beach, and as many as thirty cart-loads have been applied to the acre. The sixth district is formed by the uplands of West Kent, a ridge of chalk hills, locally called the "Hog's Back," about 6 or 7 miles broad; the soils are various, but chiefly a stiff clay, with many surface flints. A large number of flocks of sheep are grazed in this district, and much timber is grown. The seventh district is the Weald, the ancient forest of the county. The soil is principally clay, with a substratum of marl, varying in stiffness. It produces wheat, oats, barley, rye-grass, clover, and beans, and a large number of cattle are fed. The eighth division is the rich, level, and extensive expanse of Romney Marsh, on the southern coast. The whole is alluvial land, consisting of a fine rich soft loam, with portions of sea sand and broken shells intermixed. The subsoil consists of alternate layers of sand and clay, mixed with shells, amongst which are sometimes found large oak trees, in various positions, and as black and hard as ebony. The breeding and fattening of sheep form the principal pursuit in this level, and the number bred is greater perhaps than in any other district of similar extent in the kingdom. The farmer has usually two kinds of land, one for breeding, the other for fattening cattle. The Romney Marsh sheep have become celebrated for the excellence of their mutton, the length of their wool, and its fineness of fibre.

The practice of agriculture in Kent is peculiar to the county. While the farmers of England generally devote their attention to two or three main crops, those of Kent remain faithful to the special productions for which the county has become famous. Kent grows half the hops produced throughout the entire country,—the "wicked weed," as it was called when introduced in the time of Henry VI.,—and they are superior to all others except those grown at Farnham. In Kent hops are generally cultivated with the spade, and planted on mounds; the cost of manure, poles, and labour is very large, the crop is uncertain, and its produce varies greatly. Owing to the demand for hop-poles more attention is paid to the growth of underwood than to that of timber, and the extensive woods for which the county was once celebrated have greatly diminished, and are rapidly disappearing. The best poles

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Kent. are those of chesnut, willow, ash, and maple, and they are generally cut from wood of from ten to fourteen years' growth. Another peculiar production of the county is seeds, especially canary and radish seeds, which form a main crop in the Isle of Thanet. Filberts are another peculiar production; the trees grow well in a rocky and gravelly soil, and are planted 12 feet apart. Only one stem is allowed to grow, and this a few inches above the ground; the branches on it are not suffered to rise higher than 5 feet, and are trained into the shape of a punchbowl; for thus the trees yield the most abundantly. Kent is, in truth, the great fruit and kitchen garden of London. Pease, asparagus, cabbage, and other vegetables are cultivated by the acre in the neighbourhood of the metropolis; kidney beans are raised to the same extent at Sandwich; there are orchards of plums and cherries, as well as of apples and pears, scattered throughout the county, but they are especially numerous in the district between Maidstone and Canterbury. There, the common plan is to plant hops, apples, cherries, and filberts in alternate rows, or two rows of filberts between a row of apples and a row of cherries. It is scarcely surprising if, under these peculiar circumstances, the agriculture of Kent is not so forward as in other counties. The rich grass cultivation which is at once the pride and peculiarity of England, is but little adopted; nor has draining been generally employed, though it would greatly improve the refractory clay soil of the county. The plough still in use is mounted on two wheels, 3 feet high; it has a beam 10 feet long, and a share 20 inches, and requires four horses in the lightest soil, and six in the stiffest. With a lighter plough two horses would be sufficient for the work. The other implements are in keeping with this unwieldy instrument, and thrashing is very generally performed with the flail. There is nothing remarkable in the stock of Kent, with the exception of the valuable breed of sheep already mentioned, which combines superior wool with the highest quality of mutton. The great national types of stock will be sought in vain in this county.

The other natural productions of the county are—salt, which is obtained at Sandwich and in the Isles of Grain and Thanet; iron pyrites, found in the Isle of Sheppey, and largely manufactured into copperas for exportation; and fish caught on the coast for the London market, and amongst them a large quantity of oysters, which are reared in artificial beds at Milton.

There are two canals in Kent. The Royal Military Canal, 23 miles long, connects the sea at Hythe with the River Rother, in Oxney Isle, and was constructed to facilitate the defence of the country during the threatened invasion of Napoleon I., but it is now converted to the peaceful purposes of commerce. The second canal is a short cut from the Stour at Sandwich, to the sea, its object being to avoid the circuitous course of the lower part of that river. There was, until of late years, a third canal, 9 miles long, extending from Gravesend to Frindsbury, opposite Chatham, by which vessels avoided a tedious circuit of 47 miles round the Isle of Grain, but this has been converted into a railroad. The county is intersected by the South Eastern Railway, which forms the great high road, *viâ* Folkestone and Dover, between London and the Continent; the branches of this line reach nearly every town within the county.

Kent has very little foreign commerce, though it is seated on a great river, and abuts on the sea. This arises from the badness of its harbours, and the proximity of London, which is naturally the reservoir of the business of the counties forming its outskirts.

Formerly there were extensive iron-works in the Weald of Kent, where iron ore is found; but since coal has been substituted for the dearer charcoal in the manufacture of iron, these works have been extinguished. Cloth and silk

were formerly manufactured largely, but these branches of industry have been destroyed by the competition of Yorkshire. Calico-printing and bleaching are carried on to a limited extent; bagging is made for hops; ware is made at Tonbridge, and gunpowder at Faversham and Dartford. Paper-making is general throughout the county. But the chief manufacture, so to speak, is that of ships, and the *matériel* of war. At Deptford, Woolwich, Sheerness, and Chatham, the government maintains large ship-building yards, in which, during the war of 1854–6, upwards of 5000 artisans were employed; and at Woolwich, there is an extensive arsenal, the largest in the world, for manufacturing and storing arms and equipments. It may be added, that the Nore, at the mouth of the Medway, is a naval station, and that a fleet of men-of-war is generally at anchor there.

The population of Kent amounted, in 1821, to 427,224; 1831, 479,558; 1841, 549,353; 1851, 615,766. Of these last, 471 were landed proprietors; 4659 farmers; 209 graziers; 40,943 out-door agricultural labourers, and 4994 in-door; 3651 post-office, inland revenue, customs, and other government officers; 6961 soldiers; 1254 marines; 415 military and 496 naval officers; 1081 seamen R.N.; 283 Greenwich pensioners; 4537 merchant seamen; 1225 fishermen; 1571 boat and barge men; 3997 male, and 25,457 female domestic servants.

The following was the population of the principal towns in 1851:—

Canterbury	18,398	Maidstone	20,740
Chatham	28,424	Margate	9,107
Dartford	5,763	Ramsgate	11,838
Deal	7,067	Rochester	14,938
Dover	22,244	Sheerness	8,549
Folkestone	6,726	Tunbridge Wells	10,587
Gravesend	16,633	Woolwich	32,367
Greenwich	105,784		

The number of houses was, in 1841, 101,332, and in 1851, 114,475. The area of the county was 1,041,479 statute acres, and the amount of real property assessed to the income-tax in 1851 was L.3,152,173.

For civil purposes the county is divided into 5 "laths," and these are sub-divided into 63 hundreds and 415 parishes, with 2 cities, Canterbury and Rochester, and 26 market-towns. The term "lath" is derived from the Saxon word *gelathian*, to assemble; in the times of the Saxon heptarchy, when Kent formed a separate kingdom of itself, the principal men of the hundreds within each of the "laths," used to assemble to regulate the affairs of the entire district. For legal and political purposes, the county is divided into East and West Kent; each division returns two members to the House of Commons, and the election for the former takes place at Canterbury, for the latter at Maidstone. The cities of Canterbury and Rochester also return two members each; the borough of Maidstone two; the cinque ports of Dover, and Sandwich with Deal and Walmer attached to it, two each; Hythe, with Sandgate and Folkestone attached, one; Greenwich, with Woolwich and Deptford attached, two; and Chatham one. The total number is eighteen.

The Cymri were the first settlers in Kent, and were followed by the Belgæ. The county afterwards became famous in history. Cæsar, when he invaded Britain, landed on its coast, it is thought on the flat shore between Walmer and Sandwich. The North Foreland is the Acantum of the historian Ptolemy. Hengist and Horsa, the Saxon allies of the ancient Britons, landed in Pegwell Bay in 445, and received a grant of the Isle of Thanet, which was then really an island, separated from the mainland by wide channels. St Augustine, "the apostle of the English," landed in the Isle of Thanet in the year 596. Ethelbert, King of Kent, was the first Christian king of England, and his subjects the first Christian people. The first

Kent.

Christian church in the island was also built at Canterbury, and it formed the nucleus of Canterbury cathedral. In the struggles of the Saxons between themselves, and against the Northmen, Kent provided a perpetual battlefield; and, so great was the courage of the Kentish men, that they obtained the right of forming the van of the Anglo-Saxon forces. About the end of the seventh century, Kent became subject to Mercia; and, in 823, it passed under the supremacy of the West Saxons, and became the appanage of the heir-apparent of the King of Wessex. Just before the battle of Hastings, William the Conqueror burnt Romney, and massacred the inhabitants, for having defeated a detachment of the Norman forces which had landed there. After the battle he burnt Dover, and hanged the governor of the castle; but during his march to London he found it expedient to confirm the privileges of the Kentish people. King John submitted to the pope's legate, Pandulph, at Dover, in the year 1213. The Dauphin of France made a descent in the Isle of Thanet in 1216, when he invaded England to assist the barons against John. Wat Tyler's insurrection broke out in Kent in 1381, and Jack Cade's in 1450. At the commencement of the disastrous War of the Roses, in 1451, the Duke of York fortified himself at Dartford; and, in 1554, Sir Thomas Wyatt raised the standard of rebellion against Queen Mary. In 1648 a desperate battle was fought at Maidstone between the troops of Charles I. and the Parliament, the latter being victorious; and, in 1667, during the reign of Charles II., a division of the Dutch fleet under De Ruyter, violating a treaty of peace, sailed up the Medway, broke the chain stretched across the river, burnt several ships at Chatham, and carried off the "Royal Charles." It may be added, that three of the most remarkable English sovereigns, Henry VIII. and his daughters, Mary and Elizabeth, were born in Kent, in the palace at Greenwich, now the hospital.

Kent, it has already been stated, formed a separate kingdom in Saxon days. It still retains many peculiar customs. The most remarkable amongst these is the tenure of gavelkind, by which the land of a father dying without a will does not descend absolutely to the eldest son, as the case is in the rest of England; but is shared by all the sons, and, in default of sons, it is shared by the daughters. According to Tacitus, this custom was derived from the ancient Germans; but there are many conjectures respecting its origin. Its effect has been to subdivide the ownership of the soil, and raise up the race of yeomen, for which the county has always been celebrated. A distich, still quoted in honour of the Kentish yeomanry, runs,—

"A knight of Cales, a gentleman of Wales, and a laird of the north
[countree,
A yeoman of Kent, with his yearly rent, will buy them all three."

The tenure of villinage never existed in Kent; and in the olden time a man had only to show that his father was born in Kent to be exempt from the bondage imposed upon the bulk of the people. The inhabitants were, therefore, emphatically called "men of Kent," it being held that a bondsman was no man, and the distinction is still cherished by the fine-spirited natives of the county. The number of yeomen tilling their own land is still considerable in Kent, principally in the hilly districts, but they are rapidly disappearing before the new constitution of property and farming.

The county is strewed with antiquities, and with historical sites. There are also several Saxon and Danish earthworks and encampments. Near Aylesford there is a remarkable cromlech, formed of four large stones, called Kit's Coty House. It is commonly supposed to be the monument of Catigern, son of Vortimer, the British commander, killed in a battle fought there in 454 against Hengist and Horsa, the latter of whom was also slain; but

whether the cromlech is a British or a Saxon work, antiquarians cannot determine. There are remains of Roman stations at Reculver, Dover, Lymne near Hythe, Richborough, and other places. Richborough Castle, situated near Sandwich (which was the ancient point of communication with the Continent), is one of the noblest of the Roman remains in England. The Roman road, Watling Street, passes through the county from Dover to the metropolis; and there are many other monuments of the Roman occupation. The ecclesiastical remains are very interesting. The church of St Martin, at Canterbury, is supposed to be the oldest Christian edifice in England. The abbey of St Augustine's (Canterbury), Faversham, Malling, Aylesford, St Radigund's near Dover, Boxley near Maidstone, West Langdon, Bilsington, Aylesford, Monk's-Horton, and one belonging to the Benedictines, near Dover, still linger in ruins, parts of some of them having been turned to useful purposes. The churches of the county are remarkably good, and amongst them are two fine cathedrals, those of Canterbury and Rochester. The church of Barfreston, between Canterbury and Dover, is a highly interesting edifice of Anglo-Saxon or early Norman architecture. Of the secular buildings, the chief are Hever Castle, on the River Eden, near the border of Sussex, the seat of the Boleyns, where Henry VIII. courted Queen Anne; Allington Castle, near Maidstone, the seat of the Wyatts; Chilham Castle, near Canterbury; and the hall and gateway of the royal palace at Eltham. Besides these, are the castellated mansions of Leeds Castle, near Maidstone, formerly the residence of Richard II. and Henry IV.; Knowle, near Sevenoaks, the seat of the Dukes of Dorset; and Penhurst Castle, the seat of the Sydneys. On the coast are the castles of Sanddown, Sandgate, Deal, and Walmer, which are fortifications rather than residences; the latter will ever be famous as the residence and death-place of the great Duke of Wellington, being attached to his office of Governor of the Cinque Ports, four of which (Dover, Hythe, Romney, and Sandwich) are situated in Kent. Nor must we forget the national asylum for disabled and aged seamen, Greenwich Hospital, the fittest and noblest institution of our maritime nation, and fully justifying, in the character of its architecture, one part of the French criticism, that "in England the palaces are built like hospitals, and the hospitals like palaces." Adjacent to it is the Royal Observatory.

(F. C.)

KENT, WILLIAM, the father of modern landscape-gardening, was born in Yorkshire in 1685. His parents, persons in humble life, apprenticed him to a coach-painter; but he soon became conscious that he had talent for a much higher walk of art, and set off to London to seek his fortunes there as a portrait and historical painter. He had the good luck to fall in with kindly patrons, who supplied him with the means of completing his studies in Italy. After a six years' residence in that country he became acquainted in 1716 with the Earl of Burlington, with whom he returned to England, and under whose roof he continued to reside till his death in 1748. The studies of both lay in the same direction, and the patron, from his wealth and position, was able to procure many commissions for his protégé. Abandoning altogether pictorial art, in which he was never likely to attain any distinction, Kent henceforth found his true sphere in architecture and landscape-gardening. Of the latter of these arts, as now practised in England, he may justly be regarded as the father. The Temple of Venus at Stowe, and the splendid palace of the Earl of Leicester at Holkham in Norfolk, are attributed to him, and, if really his, do great credit to his architectural taste and talent. In the ages previous to his, artists had been held to succeed in proportion as they banished every touch of nature from their designs; and every garden with the least pretensions to fashion was filled with giants, animals, monsters, coats of

Kent,
William.

Kentucky. arms, and mottoes in yew, box, and holly. Absurdity could go no further, and luckily at this moment Kent appeared painter enough, in the words of Walpole, "to taste the charms of landscape, bold and opinionative enough to dare and to dictate, and born with a genius to strike out a great system from the twilight of imperfect essays." Nature was everywhere restored, and the old absurdities were discarded for ever. Gardens and lawns were from this time laid out according to the laws of perspective, and light and shade. A similar reformation was effected in the management of water; canals, circular basins, and cascades tumbling down marble steps, were supplanted by streams which seemed to wind away at pleasure, and were lost and restored to view again at proper intervals. Not seldom his imitations of nature were carried too far, as when, in Kensington Gardens, he planted dead trees to give a greater air of truth to the scene. But he was easily laughed out of this extreme, whose folly he was himself one of the first to detect. As a sculptor, Kent never attained any eminence. The well-known statue of Shakspeare in Westminster Abbey is from his chisel, and does very little credit either to his taste or judgment.

KENTUCKY, one of the western states of N. America, is bounded N. by the Ohio, separating it from Ohio, Indiana, and Illinois, W. by the Mississippi, separating it from Missouri, S. by Tennessee, and E. by the Cumberland Mountains and Big Sandy River, which divide it from Virginia. Its greatest length E. and W. is 368 miles; average breadth 150. Area 37,680 square miles, of which about the half was cultivated in 1850.

The face of the country for the most part is level or undulating. The most elevated land is in the S.E., where the spurs of the Cumberland Mountains traverse several of the counties. Their elevation nowhere exceeds 2000 feet. A range of hills, intersected by deep narrow vales, runs nearly parallel with the Ohio at a distance of from 5 to 20 miles. Between the hilly region of the E. and N.E. and Green River, extends an undulating and fertile tract of about 150 miles long, embracing more than half the area of the state. The district between Green and Cumberland Rivers, known as the "Barrens," is chiefly occupied as pasture-land; that to the W. of Cumberland River is mostly flat and moderately fertile. The country generally is well wooded, and the hills are crowned with lofty trees. All the principal streams are tributary to the Ohio, which washes the northern boundary of Kentucky in its entire extent, giving a steamboat navigation of above 600 miles, and opening to the state the inland commerce of the Ohio Valley. In like manner the Mississippi on the W. gives access to the commerce of the vast territory beyond. The Big Sandy forms the eastern boundary of the state for about 100 miles. It enters from Virginia, flowing northward into the Ohio, and is navigable for about 50 miles. The Licking, Kentucky, and Green River have their entire course within the state. They all rise in the Cumberland Mountains, and flow W. and N.W.; the two latter are navigable respectively to distances of 60 and 150 miles. The Cumberland River also rises in the mountains of that name, flows W. and S.W. for about 300 miles, makes a bend of above 200 miles into Tennessee, and re-enters Kentucky about 80 miles from its junction with the Ohio. It is navigable for steamers to Nashville in Tennessee. The Tennessee River has about 70 miles of its course in Kentucky, and enters the Ohio about 10 miles below the Cumberland.

The prevailing geological formation throughout Kentucky is the blue limestone, which is much used for building. A good marble is found among the cliffs of the Kentucky River. Sandstone is also common, and extends from Louisville to Danville. Bituminous shale and pudding-stone are also abundant. The lime-stone region abounds in caverns, sinks (deep conical hollows), and sub-

terranean water-courses. Into these latter the smaller streams disappear during the dry season. Of the caverns, the most celebrated is the Mammoth Cave, which is regarded as one of the chief wonders of the American continent. It lies near Green River, in Edmonson county, and consists of an endless series of lofty chambers connected by long narrow galleries, supposed to extend in all their ramifications to more than 40 miles. Near the entrance, which is reached after a descent of 80 feet, is a great antechamber, 200 feet long, 150 feet wide, and 50 feet in height: here have been found large quantities of gigantic bones. In one chamber mummies have been discovered; from the roof of another hang clustering countless legions of bats; the waters of the cave are inhabited by a species of fish absolutely destitute of eyes; and one chamber has been converted into a residence for consumptive patients, to whom its pure and mild air is found beneficial. Another place of much interest to the naturalist is Big Bone Lick, near the banks of the Ohio, so named from the fossil remains of antediluvian megatheria found there in large quantities. Of these many have found their way to Britain.

The coal-beds of Kentucky, which extend from the neighbouring states on the N. and E., occupy a vast area, but have hitherto been worked to a very inconsiderable extent. Iron is equally abundant, but of inferior quality, and it also has been comparatively neglected. Lead and silver are found in small quantities. Salt springs or "licks" (so called by the early settlers, from their being favourite resorts of wild animals, which regaled themselves by licking the mineral) abound in the sandstone formation; and nitrate of lime and gypsum are found in the caves. Mineral springs are numerous.

The climate is salubrious, the thermometer seldom rising above 80°, or descending below 25°, in the centre of the state. The mean annual temperature is about 58°. The best soil of Kentucky is that of the limestone formation. The most fertile portion of the state, and surpassed by few tracts in America, is that watered by the Licking, Kentucky, Dick's River, and the upper course of Green River; the soil is a loose black mould, the product of the dense forests which at one time covered the face of the country. Of these there are still considerable remains, and the variety of trees, some of which, as the poplar, attain enormous dimensions, is as great as in any of the states. Among the more common trees in the cultivated districts are the paw-paw, sugar-maple, honey-locust, and coffee-tree. The *Panicum virgatum* which grows in dense brakes to the height of 12 feet, affords rich pasture for cattle.

The principal agricultural products of Kentucky are flax, hemp, and tobacco. Of the entire crop of these raised in the states, Kentucky yields respectively five-eighths, four-sevenths, and above one-fourth. The number of farms in 1850 was 74,777; the extent of improved land in farms 5,968,270 acres; of unimproved 10,981,478 acres. The cash value of these farms was estimated at L.31,204,250, ranking it fourth in this respect among the states. In production of wheat it stood eleventh; of oats, third; of Indian-corn, second; of wool, seventh. The crop of wheat was 2,142,822 bushels; of maize, 58,672,591 bushels; of oats, 8,201,311 bushels; potatoes, 1,492,487 bushels; of tobacco, 55,501,196 lbs; of wool, 2,297,433 lbs; of flax, 2,100,116 lbs.; of hemp, 17,787 tons. The number of horses was 315,682; milch cows, 247,475; working oxen, 62,274; other cattle, 442,763; sheep, 1,102,091; swine, 2,891,163; total value of live stock, L.5,932,800. Produce of butter, 9,947,523 lbs.; cheese, 213,954 lbs.; bees'-wax and honey, 1,158,019 lbs. The principal fruits reared are apples and peaches, from which cider and brandy are extensively manufactured for home consumption. The industry of the state is mainly agricultural; the chief manufactures are leather, tobacco, woollens, cotton, ropes, &c.

Kentucky. Its foreign commerce is limited, and passes chiefly through New Orleans. The amount of shipping (all steamers) in 1850 was 14,820 tons. The means of internal communication are extensive, the state being nearly insulated by navigable waters, with numerous tributaries, aided by canals and other works. Of these the most important is the Portland and Louisville Canal, constructed to obviate the difficulty to navigation caused by the Ohio Falls. This important work is about 3 miles long, and has been for the most part hewed out of the solid limestone: the cost was L.240,000. Several railways are in operation, of which the chief are the lines connecting Louisville, Frankfort, Lexington, and Covington; and other lines are in progress.

There were in 1851 five banks, with twenty-one branches, in Kentucky, with an aggregate circulation of L.1,522,650. Capital, L.1,507,400; deposits, L.464,750.

The population in 1850 was 982,405, of whom 761,417 were whites, 10,007 free coloured, and 210,981 slaves; 601,764 were natives of Kentucky. The state is divided into 100 counties. The capital is Frankfort, in the county of Franklin, but the largest town, and the commercial metropolis of the state, is Louisville, which in 1853 had 57,726 inhabitants. After it in population come Covington, Lexington, Newport, Maysville, Frankfort, and Paducah. The state legislature consists of a governor, elected by the people for four years, a senate of 38 members, elected for a like term, one-half every two years, and a house of representatives of 100 members, elected for two years. Kentucky sends 10 members to the national congress, and has 12 votes in the presidential election.

The state revenue in 1854 was L.177,050; the expenditure, L.154,690; the public debt, L.1,229,470; the assessed value of property, L.81,166,000. The rate of taxation, 17 cents for every 100 dollars' worth of property. The judicature consists of an appeal court, composed of one chief justice, and three associate judges, with salaries of L.417 each; a court of chancery, presided over by a single chancellor, salary L.375; twelve circuit courts and county courts, consisting of a presiding judge and two associates. All these officials are popularly elected. There are also two justices of peace and a sheriff in each county. The state militia, in 1852, numbered 88,979 men. Education is provided for by a state school fund, amounting, in 1854, to L.280,070, and an annual property-tax yielding about L.15,600. The number of children between five and sixteen, in 1854, was 227,123, of whom 207,210 were on the school books; the average attendance was 76,429. There were, in 1852, 8 colleges with 656 students, besides 2 medical schools, with 590 students, two law schools with 125 students, and 1 theological school with 18 students. The principal colleges are the Louisville University, and the Transylvania University at Lexington. Of religious denominations the most numerous are the Baptists, next to them the Methodists; total number of places of worship in 1850, 1818; value of church property, L.452,030. The number of newspapers and periodicals published in 1850 was 67,—9 daily, 5 tri-weekly, 4 bi-weekly, 41 weekly, 1 fortnightly, and 7 monthly; their total annual circulation, 6,582,838 copies.

The first pioneers of civilization in Kentucky were Boone and Knox, whose exploits and perils are among the most cherished traditions of the Kentuckians. The first settlement was established between 1760–70. At first Kentucky was a county of Virginia; it was declared independent in 1790, and was admitted into the Union in 1792. The inhabitants still retain much of that frank and hospitable, if sometimes boisterous, style of life and manners inherited from the bold hunters who first wrested the land from the dominion of savages and beasts of prey. Certain relics of antiquity seem to indicate that at a very remote period this

country was possessed by a race not unacquainted with the arts of civilization. The most remarkable of these are the traces of regular fortifications on the banks of the Ohio, opposite Scioto River.

KENYON, LORD, an eminent English lawyer, Chief-Justice of the King's Bench from 1788 to 1802, was born in 1732, at Greddington, in Flintshire. Such early training as he had he received at the grammar-school of Rathin; but he had only some small progress in the Latin grammar when he was withdrawn, and at the age of fourteen articulated to an attorney in extensive practice at Nantwich, in Cheshire. During his seven years' apprenticeship he showed such aptitude for legal studies, that he became a great favourite with his master, and was even led to hope that in course of time he would be admitted to a partnership in the business. Disappointed in this hope, he resolved to prepare himself for the English bar. Proceeding to London in 1754, he entered Lincoln's-Inn; and, seven years later, was called to the bar. Without friends, and too proud to stoop to the small arts by which success is reached, he remained for many years poor and unknown. Still hopeful, he attended regularly the courts of equity and common law (especially the former), and was equally punctual at sessions and circuit. At last, by slow degrees, he began to make way as an equity draftsman and conveyancer; and, having attracted the notice of Mr Thurlow, then attorney-general, he had soon more to do than he could overtake. In 1779 he was associated with Mr Erskine as leading counsel for Lord George Gordon, then on his trial for high treason. Three years later he was made attorney-general under the Rockingham administration, and retained office when Pitt became Chancellor of the Exchequer. In 1784 he became Master of the Rolls, and was made a baronet; and, four years later, he succeeded Lord Mansfield as Chief-Justice of the King's Bench, with the title of Lord Kenyon, Baron Greddington. His elevation to this high office gave great offence to the lawyers, with whom Kenyon was very far from being popular. His *personnel* was very little calculated to recommend him to the profession. Deeply learned in the law, he was quite ignorant of everything beyond its pale. He was a very poor orator; and his manners, always ungracious, were often irritating, and even insolent in the extreme. Hating show and pomp of every kind, he dressed shabbily, drove a miserable equipage, and almost never entertained. On the bench he ruled like a despot, and would never allow even his brother judges to express opinions differing from his own. To the counsel who appeared before him he was still more stern and arbitrary, and often put down any freedom of thought or speech on their part in cruelly harsh and undignified language. With the public, on the other hand, Lord Kenyon was in the highest degree popular, chiefly on account of the inflexible impartiality with which he administered justice. The vices and crimes of the higher classes he punished more severely in proportion to the rank and wealth of the offenders. He often threatened, that if the highest lady in the land were brought before him and convicted of gambling, she should stand on the pillory for it. Libels, and especially political libels, he also punished with rigorous severity. In the case of poor offenders, or such as he believed to have been betrayed into crime by designing persons, he was always merciful; and, though his great maxim was, that the law was no respecter of persons, he sometimes strained it in their favour.

From his complete destitution of literary accomplishment, Lord Kenyon's decisions, though now regarded as of the highest authority, were often so ill-reasoned and obscurely worded, as to be far from satisfactory; and thus the value of the adjudication was damaged by the apparent unsoundness of the grounds on which it was based. This defect was also due in some measure to the haste with which he

Kenyon.

Kepler
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Kerman.

pushed through his work. He often despatched between twenty and thirty cases in the course of a single day.

Lord Kenyon died in 1802, in the fifteenth year of his public life as Chief-Justice of the King's Bench. His death is said to have been hastened by the loss of his eldest son, who was to have inherited his title and the immense fortune which he had amassed.

KEPLER, JOHN. See DISSERTATIONS IV. and V.; and art. ASTRONOMY, Parts I. and IV.

KERBELA, or MESHED HOSSEIN, a large and populous city of Asiatic Turkey, pashalic of Bagdad, and 60 miles S.W. of the town of that name. It is surrounded by a wall upwards of 2 miles in circumference, is entered by five gates, and has a well-supplied bazaar, and several caravansaries. The chief ornaments of the city, however, are the tomb of Hossein, adorned with a lofty gilded cupola, and a magnificent mosque. Its ancient name was *Vologesia*; but it was an inconsiderable place till Hossein, the son of Ali by Fatima, the daughter of the prophet, was interred here, having been slain in the vicinity, when it became a great resort of pilgrims. An ancient canal connects this town with the Euphrates.

KERESOON, or KERASAN (the ancient *Cerasus*), a seaport-town of Asiatic Turkey, on the Black Sea, government of Trebisond, and 75 miles W. by S. of the town of that name, in N. Lat. 40. 57. 10., E. Long. 38. 24. It is situate on a rocky promontory forming the western boundary of a spacious bay. The town, which is now in a very wretched and ruinous condition, appears to have been formerly a place of considerable strength and importance, and a considerable part of the ancient wall still exists. It has some ship-building, and carries on a small trade in corn with the Crimea. Pop. probably about 3000.

KERGUELEN LAND, or ISLAND OF DESOLATION, an island of the Indian Ocean, named after its discoverer, Kerguelen, a Frenchman, and visited by Captain Cook in 1779. It is almost totally destitute of vegetation, and has a cold and moist climate. The surface is rugged and mountainous, and the coasts deeply indented by bays and inlets. It is resorted to by numerous wild fowl and seals. N. Lat. 69. 30., E. Long. 49. 20.

KERKOOK (the *Demetrias* of Strabo, and the *Corcura* of Ptolemy), a large town of Asiatic Turkey, Lower Kurdistan, on the direct road from Bagdad to Mosul, 130 miles N. of the former, and 100 S.E. of the latter. It is a large open town, in a plain; but, like all the towns in this part of the world, is in great part in ruins. The streets are narrow and filthy, and the houses mean. It is said to have no manufactures except a coarse calico, but there is a considerable trade in gall-nuts, which are brought from the Kurdistan Mountains. There are numerous naphtha pits in the vicinity. Pop. about 13,000, Arabs and Osmanlis, with some Christians and Jews. N. Lat. 35. 27., E. Long. 44. 27.

KERMAN, or KIRMAN (anc. *Caramania*), a province of Persia, lying between N. Lat. 25. 30. and 31. 20., and E. Long. 54. 30. and 60. 20., having N. Khorassan, E. Afghanistan and Beloochistan, S. the Persian Gulf, and W. Laristan and Fars. It is about 380 miles in length from N. to S. by 250 in extreme breadth, and has an estimated area of 65,000 square miles. Kerman is represented as being a generally mountainous territory, but the greater part of it is comparatively unknown. A mountain chain, the Djebel Abad, intersects the province from E. to W., and sends off numerous ramifications southward towards the coast. N. of this chain, the country is in general a barren, dreary waste, without a single river to irrigate the land. Almost the only exception to this is the district of Nurman-sheer, about 90 miles in length by from 20 to 30 miles in breadth, and which is tolerably well watered by mountain streams, and has a good soil. A few productive spots are also to be found in the neighbourhood of mountain springs,

Kerman
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Kerowlee.

or where subterraneous reservoirs have been made for irrigation. S. of the Djebel Abad, the country is very mountainous. Many of the plains and valleys are of great fertility, but here too are large tracts of barren waste. The principal river here is the Rud Shur, which flows southward into the Persian Gulf. The climate of Kerman is said to be less healthy than that of other parts of Persia. The chief productions are wheat, maize, barley, cotton, tobacco, saffron, madder, gums, and various kinds of fruits. The dates and grapes of particular parts are said to be very fine, but the other fruits are of inferior quality. White roses are extensively cultivated, the *attar* of these being highly esteemed. The mulberry tree is also largely cultivated for the breeding of silkworms. The rearing of cattle, sheep, goats, and camels, receives much attention. The inhabitants on the coast are chiefly engaged in fishing, but the pearl fishery, once so famous, has now been abandoned. The mineral wealth of the province is said to be considerable, but iron, copper, and sulphur, are the only products hitherto obtained. The manufactures comprise fine woollen fabrics, carpets, goats' and camels' hair shawls, coarse linens, and matchlocks. The southern part of Kerman, called Mogostan, is subject to the Imam of Muscat. Pop. about 600,000.

KERMAN, or *Sergan*, the capital of the above province, is situate at the western extremity of an extensive plain, and commanded by two old forts on the neighbouring hills, N. Lat. 29. 56., E. Long. 56. 25. It is surrounded by a mud wall and dry ditch, and is entered by four gates. It has a citadel, in which the governor resides, a well furnished bazaar, several large caravansaries, and numerous baths and mosques. Kerman was once the most important city in the empire, being the great centre of trade between the Persian Gulf and the countries to the N.E. and W. It has frequently suffered from hostile attacks, particularly in 1794, when it was taken by Aga Mahomet Khan, its walls and public buildings levelled to the ground, many of its inhabitants put to death, and 30,000 driven into exile. The rise of Bushire as a trading port has also taken away a great part of the trade of Kerman, which, however, is still considerable. It has also important manufactures of goats' and camels' hair shawls, carpets, and matchlocks. Pop. about 30,000.

KERMANSRAW, a town of Persia, capital of Persian Kurdistan, and of a cognominal district, 80 miles W.S.W. of Hamadan, in N. Lat. 34. 30., E. Long. 47. 12. It stands on the S.W. slope of a range of mountains near the right bank of the Kerkah or Karasu, and is surrounded by an earthen wall nearly 3 miles in circumference. It is said to be a very flourishing town, deriving great advantage from its situation on the great S. road from Persia into Asiatic Turkey. It has many public buildings, gardens, and baths. Chief manufactures, carpets and swords. Pop. about 30,000. About 6 miles from Kermanshaw are sculptures of Greek workmanship, commemorating the victories of the Persians over the Romans.

KERMES. See DYEING, Chap. IV., 3.

KEROWLEE, a town of Hindustan, and the principal place of a native state of the same name, situate in the province of Rajpootana. The houses are built of brick, and those of a superior class are faced with squared stone, but the streets are narrow and filthy. The territory of Kerowlee has an area of 1878 square miles, with a population of 187,000. Within the last few years, the distracted condition of this principality induced the reigning prince to solicit the interference of the British government, and a compliance with his request led to the restoration of tranquillity. Upon the death, in 1852, of the Rajah Nursing Pal, his adopted son, Bhurt Pal, was recognised by the British government as his successor, and arrangements were made for the administration of the state during the minority of the young prince. The total revenue of the country is stated at

Kerry. L.50,690, but so much has been alienated as to leave little more than two-thirds of that sum for the use of the state. The town of Kerowlee is in Lat. 26. 28., Long. 77. 10.

KERRY, a maritime county in the province of Munster, in Ireland, bounded on the N. by the estuary of the Shannon, which separates it from the county of Clare; on the E. by the counties of Limerick and Cork; on the S. by the county of Cork and part of Kenmare estuary; and on the W. by the Atlantic Ocean. The tribe of the Juvernii inhabited this part of Ireland when Ptolemy wrote. Previously to the English invasion, the O'Connors were in possession of the northern, the Moriartys of the central, and the O'Sullivans and O'Donoghoes of the southern portion of the district. The M'Carthys, who were the chief of the Irish septs in South Munster before the arrival of the English, retired into the wilds of Kerry when dispossessed of their more valuable tracts of country. In consideration of services rendered, Dermot MacCarty granted a considerable tract of this county to the celebrated English adventurer Raymond le Gros, who settled his son Maurice here. Maurice became so potent that he gave his name to the part of Kerry then called Lixnaw, from the ancient Luceni, as also to his family, the country being called Clanmaurice, and the family Fitzmaurice, to this day. In 1329 Maurice Fitzgerald, great-grandson of the first Lord of Kerry, was created Earl of Desmond. The county had been made shire-ground so early as 1210 by King John; but now the southern portion, together with a large part of the county of Cork as far as the mouth of the Blackwater, was formed into a palatinate in favour of the Desmond family, the head of which exercised an authority nearly equal to that of sovereign in the district until the close of the reign of Queen Elizabeth. After the attainder of Gerald, the sixteenth and last Earl of Desmond, the family estates were parcelled out among various English knights and gentlemen, viz.,—Sir William Herbert, Charles Herbert, Esq., Sir Valentine Browne, Sir Edward Denny, Captain Conway, John Holly, Esq., &c. On the breaking out of the rebellion of 1641 the native Irish regained possession of a considerable portion of the county, but their property was afterwards extensively confiscated, and among the new proprietors was Sir William Petty, whose estates, as well as those of the Fitzmaurices, are held by the Marquis of Lansdowne, who represents the ancient barons of Kerry. The county is at present divided into the eight baronies of Clanmaurice, Corkaguiney, Dunkerron, Glenarought, Iraghticonnor, Iveragh, Magunihy, and Trughanachmy, and extends over a surface of 1853 square miles, or 1,186,126 acres, of which 414,614 are arable, 726,775 are uncultivated, 11,169 are in plantations, 807 are occupied by towns and villages, and the remaining 32,761 acres are covered with water.

The county contains the two dioceses of Ardfert and Aghadoc, which have from time immemorial been united so intimately that the parishes belonging to each cannot be ascertained. In 1663 they were both allowed to be held *in commendam* by the Bishop of Limerick, and the union thus formed has not been since disturbed. This union of dioceses is the only one that has not been in some manner altered by the late arrangements for the reduction of the number of Irish bishoprics. The diocese of Ardfert includes the northern part of the county; the seat of the see is Ardfert, a small town, now little more than a village. The cathedral was burned in the wars of 1641, but a small part of the building was afterwards fitted up for divine service, and in 1831 was completely repaired. The seat of the diocese of Aghadoc, which comprehended the southern part of the county, is at a place of the same name, near Killarney, where the ruins of the cathedral are still to be seen. The number of parishes in the united dioceses is 88.

Previously to the Union, the county returned eight members to parliament,—two for the county, and two for each of

the boroughs of Tralee, Dingle, and Ardfert. At the Union the number was reduced to three,—two for the county and one for Tralee. The Reform Act made no alteration in this arrangement. Kerry is in the Munster circuit, and is divided for poor-law purposes into the unions of Cahirciveen, Dingle, Kenmare, Killarney, Listowee, and Tralee. The head-quarters of the constabulary force in the county are at Tralee, and sub-inspectors are stationed at Cahirciveen, Dingle, Kenmare, Killarney, Listowel, and Tralee.

The population of the county, according to the estimate of De Burgo, amounted to 56,628 in 1760; in 1792 Beaufort judged it to amount to 107,000. The first parliamentary census, taken in 1813, which, however, was very inaccurate, stated it at 178,622; that of 1821 gives 216,185; that of 1831, 263,126. The census of 1834 being returned according to dioceses instead of counties, prevents the specification of the amount of the population at that period; but from that return it appears that the dioceses of Ardfert and Aghadoc, which are nearly commensurate with the county, contained 304,687 souls, of whom 7529 were Protestants of the Established Church, 27 Protestant Dissenters, and 297,181 Roman Catholics. In 1841 the population was 293,880, which decreased in 1851 to 238,239. Of this number, 44,455 are returned as speaking only the Irish language, which is spoken by 61 per cent. of the population of the county.

The land in the northern part of the county is low, rich, and generally level, although it rises to an elevation of 710 feet above the sea in Maun Mountain, which occupies the centre of Kerry Head, a remarkable promontory projecting from the mainland into the Atlantic. The middle part is an upland, gradually rising to the E. and S.; the southern and western parts are almost wholly mountain, glen, and bog, comprising some of the highest points in Ireland. The loftiest of these, and the highest mountain in Ireland, is Carruntuohill, 3414 feet above the sea, being the summit of the range called M'Gillycuddy's Reeks, which stretches across the barony of Dunkerron, sending out branches in various directions. Next to Carruntuohill the highest summits are—Caper, 3200; Mangerton, 2756; Purple Mountain, 2739; and Coomenagh, 2446 feet above the ocean. To the west is the mountain of Drung, which rises precipitously from Dingle Bay to a height of 2104 feet; over the edge of the cliffs at an elevation of 200 feet, a road is carried, little inferior, says Inglis, in the magnificence of its mountain and sea views, to any of the celebrated roads along the shores of the Mediterranean, and every way superior to the road from Bangor to Conway in North Wales. In the barony or peninsula of Iveragh also rise the lofty summits of Cullen, 2231; Knockadubber, 2000; and Knockatubrid, 1556 feet high. More northerly are—Brandon Hill, 3127 feet; the Slieve Mish Hills, the Stacks, and the Glanruddery Mountains, all of inferior elevation to those already mentioned. These mountain ranges are intersected by deep and precipitous glens and ravines, possessing features of sublime and picturesque scenery. The most remarkable of these is the Gap of Dunloe, lying between Tomies and M'Gillycuddy's Reeks, formed by mountains on each side, nearly perpendicular; it has a flat base or floor, which renders the passage through it easy to both horsemen and pedestrians, and opens into a valley watered by a succession of mountain lakes, and terminated by a romantic waterfall. These valleys are the beds through which numerous small rivers take their course. The most northern rivers are the Feale, Gale, and Brick, which, having formed a junction near Rattoo church, form the Cashin, a wide but short tidal stream which runs into the estuary of the Shannon. The Maine runs from Castle Island to the head of Castlemaine Haven. The Flesk, after a winding course through Glan-flesk, falls into the Lower Lake of Killarney, from which it passes, under the name of the Laune or Lane, with a

Kerry. body of waters much augmented, into Castlemaine Haven. The Carra, rising in the mountains of Dunkerron, falls into the same bay. The Ferta and the Inny rise near Drung Mountain, collect the waters from the boggy uplands, and flow westward, the former into Valentia Harbour, the latter into Ballinskeligg Bay. The Ruaghty empties itself into the head of the estuary called Kenmare River. The Blackwater flows from the Dunkerron Mountains into Kenmare River, part of the boundary between this county and Cork. Lakes are numerous, but few of large size. The principal are the picturesque Lakes of Killarney. They are situated near the town of Killarney, at the northern side of the range of mountains of which the Reeks form the summit, and consists of three lakes, named the Lower (Lough Leane), the Middle (Muckross or Torc), and the Upper Lake. The first and second, which are on the same level, are separated only by a narrow peninsula, on which stands the fine ruin of Muckross Abbey, embosomed in lofty woods, and still retaining many fragments of its ancient grandeur and picturesque architecture. The Upper Lake, the level of which is five feet higher, is connected with the others by a river navigable by boats, a perfect specimen of close river scenery, and equally admired as the lakes themselves. The lower lake is studded with islands, of which the most remarkable, both for fertility and beauty, is Inisfallen, above 12 acres in extent, and contains, besides a small banqueting house, the ruins of an abbey of the same name, founded in 600, and the locality where one of the most ancient of the native chronicles, entitled the *Annals of Inisfallen*, was written. It consists of extracts from the Old Testament, a compendium of universal history down to the arrival of St Patrick in 432, and, thenceforward to the end, treats of the affairs of Ireland, finishing at 1319. The original, commenced A.D. 600, and continued during 500 years, is now preserved in the Bodleian Library at Oxford. On Ross Island are the ruins of Ross Castle, the garrison of which made a gallant stand against the parliamentary forces in the wars of 1641. Another, named O'Donoghoe's Prison, is supposed to have been used as a place of confinement by a chieftain of that name. The other more remarkable features of the Lower Lake are O'Sullivan's Cascade, and the Bay of Glenna, where there is an extraordinary echo. The Upper Lake has twelve small islets. The other lakes in the county are Lough Carrane, near Ballinskeligg Bay, containing several islands, Lough Brin, Lough Carra, and Lough Guitane, besides many of smaller extent.

The Lakes of Killarney are not of great size, the Lower Lake, which is the largest, covers 5001 acres, the Middle 680, and the Upper Lake only 430 acres. They are all exceedingly beautiful, but the Upper Lake, although smaller, has more grandeur. The numerous islets and wooded promontories diminish the extent of water seen at one time; but "almost every islet and promontory, whether rising from the water in steep, bare rocky cliffs, or sloping gentler down to it, is crowned with the most luxuriant canopy of trees, among which the arbutus, distinguished by its subdued and mellow green, is most conspicuous."

The coast is indented by several large bays. Nearest to the county of Cork is the great estuary called the Kenmare River, which contains some good harbours, and has many small islands along its shores. The next is Ballinskeligg Bay, to the N. of which are the Skellig Islands. On the largest of these, which is a lofty rock of slate rising several hundred feet above the level of the sea, there was formerly a convent, which was afterwards transferred to the mainland. Two lighthouses were erected on this island in 1826: one of the lights is placed 372 feet above the level of the sea, being the most elevated of all the lights on the Irish coast. The gannet breeds here, and nowhere else on the coast. N. of this bay, and separated from the mainland by a safe and capacious roadstead, is Valentia Island,

chiefly the property of the Knights of Kerry; the greater part of the island is under tillage, and it contains an extensive and valuable slate quarry, which is worked for export. Dingle Bay succeeds, containing within it Castlemaine, Ventry, and Dingle Harbours, and having the Blasquet Islands at its northern extremity. Dunmore Head, to the N.W. of this bay, is the most western point of the mainland of Ireland. Smerwick Bay, Brandon Bay, and Tralee Bay are adapted for smaller vessels only: between the two latter are the Magharees or Seven Hogs Islands. Ballyheige Bay, which is entirely exposed during westerly winds to the fury of the Atlantic Ocean, is separated from the Shannon by the bold promontory of Kerry Head. Within the mouth of the Shannon are the harbours of Ballylongford and Tarbert, the latter protected by the island of the same name. Nearly the whole of the coast of Kerry is bold and mountainous, adding much to the picturesque beauty of the district. The late Sir David Wilkie expressed an opinion that the county of Kerry, so nobly indented with bays of the Atlantic Ocean, and possessing a climate so favourable for vegetation, along with its mountains and inland waters, might, without injustice, be pronounced, in point of scenery, the finest portion of the British islands. Many plants, generally deemed suitable only for the genial atmosphere of more southern latitudes, grow here freely; and cattle remain frequently in the open air during the whole winter.

The soil in the northern parts of the county is retentive and coarse; the middle district is mostly of an alluvial character. The valley of the River Maine is entirely limestone. The uplands are chiefly argillaceous, but with limestone intermixed. The valleys in the mountainous region of the S. are mostly covered with bog; and, though at present little better than wastes, they are capable, from their favourable exposure, of being cultivated to advantage. All the limestone in the county is secondary, with marine remains and calc spar. The north-western coast to Kerry Head is composed of beds of argillaceous sandstone, nearly horizontal, in the parting of which, the quartz crystals called Kerry-stones are found. The midland district is mostly argillaceous, composed chiefly of slate clay and hard sandstone, covering beds of anthracite and culm, which has not been raised for fuel, partly on account of the abundance of turf, partly from the offensive vapour of the coal when ignited. The component rock of the mountains which form the whole of the southern district is of the clay-slate formation. The slate is quarried for roofing, particularly at Valentia Island. It is light and durable, splits readily, bears piercing, and is harder and more siliceous than that of Bangor. In all the mountains the common gritstone contains large quantities of quartz crystals. Detached blocks of it are also found in the valleys, in some places in such quantity as seriously to impede cultivation. Iron ore is found in great plenty in the southern parts, and was largely manufactured at Killarney and Blackstones, until the works were stopped by the failure of timber for fuel. Copper was raised at Ardtully, near Kenmare, at Muckross, and in Ross Island. The marble of Tralee is marked like that of Kilkenny, with more white spots; other kinds of marble have been raised in various parts. Fine amethysts have been found near Kerry Head. Potter's and pipe clay, a substance like tripoli, brown ochre, and fuller's earth, are to be met with in various places. The whetstones found near the Devil's Punch-Bowl are much valued. Fossil shells, particularly cardites and terebratulites, are frequent. Several mineral springs, some chalybeate, others sulphureo-chalybeate, have been discovered. Of the former, there is one near Killarney, another near Valentia Island, another at the mouth of the Inny, and several between Blackstones and Killorglin. Of the latter, the most celebrated are near Dingle, Castlemaine, and Tralee. A saline spring at Mag-

Kerry. herybeg, in Corkaguiney, rises a little below high-water mark, bursting out of a clear white sand.

The following tables exhibit the variations in the culti-

vation of the land, and the quantity of stock, in each year since 1847, when the agricultural returns were first collected and published by the Irish government:—

Kerry.

Years.	Wheat.	Oats.	Barley, Bere, Rye, Beans, and Pease.	Potatoes.	Turnips.	Other Green Crops.	Flax.	Meadow and Clover.	Total under Crops.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1847	5,616	40,188	10,704	18,319	5,788	957	132	47,091	128,795
1848	4,939	32,440	12,218	34,455	5,498	1,510	243	56,946	148,249
1849	5,149	27,983	16,622	26,030	10,986	2,198	136	50,104	139,208
1850	4,502	30,190	17,326	30,963	10,434	1,732	300	53,424	148,871
1851	3,532	33,726	20,482	24,892	14,912	2,646	678	56,813	157,681
1852	1,637	34,942	13,463	25,811	12,896	2,472	680	52,461	145,362
1853	1,932	35,922	12,865	27,700	12,677	2,970	1,035	56,174	151,275
1854	2,450	34,139	9,696	30,144	10,512	2,334	673	54,101	144,049
1855	2,716	36,651	7,702	31,357	9,737	2,523	621	56,362	147,669
1856	3,549	35,525	6,537	33,810	10,206	3,053	1,039	56,570	150,131

Years.	No. of holdings exceed- ing 1 acre.	HORSES.			Mules.	Asses.	CATTLE.			SHEEP.		PIGS.		Goats.	Poultry.
		2 years old and upwards.	1 year old and under 2.	Under 1 year.			2 years old and upwards.	2 years old and under.	Under 1 year.	1 year old and upwards.	Under 1 year.	1 year old and upwards.	Under 1 year.		
1847	25,006	15,536	1,404	3,581	115	356	16,324	63,664	9,939	15,699	9,842	14,434	170,960		
1848	21,592	12,643	872	887	1,587	3,439	97,959	20,106	20,565	55,499	13,061	10,922	15,473	15,617	201,239
1849	19,082	11,918	622	795	1,679	3,283	101,924	20,645	18,384	51,350	11,217	15,252	13,450	17,487	168,604
1850	17,994	11,629	682	838	1,516	3,417	100,070	24,435	22,743	45,935	13,996	17,487	18,759	17,382	183,150
1851	17,253	10,913	505	887	1,506	3,942	103,830	26,812	28,465	49,784	14,654	22,279	22,270	18,835	211,331
1852	16,604	10,320	591	1,010	1,335	3,710	107,191	31,057	32,650	51,532	13,605	21,915	17,405	21,388	201,077
1853	16,776	10,264	737	1,370	1,389	4,289	111,735	36,548	37,824	53,814	20,852	19,324	21,513	24,853	239,489

There are no manufactures of importance carried on in the county; the manufacture of coarse linen is mostly confined to the barony of Corkaguiney. A quality of narrow cloth, of strong texture, called bandle-linen, and also "box and trap," was formerly in demand for the army and the West India market. It owed its reputation to the careful method of preparing the yarn, but has fallen into disrepute. The manufacture of woollens is almost entirely confined to that employed in the domestic consumption, the rest being sent in the raw state to the Cork and Limerick markets. Flannels, however, are sold in some quantities in the markets of Tralee and Dingle.

The fishery is chiefly carried on at Dingle and Valentia, from the former in row-boats, and from the latter in sailing vessels. A fishery is also carried on along the shores of the Kenmare River. All kinds of round fish are taken, as are also herrings. Pilchards were caught in large quantities, but they have lately deserted the coast. Shell-fish of every kind are large and abundant. Salmon is caught in the rivers; but in some places the numbers are supposed to be considerably diminished by the seals which frequent the rocky shores.

The deep and extensive vales with which the mountainous district in the south is everywhere indented, are almost wholly occupied with bog, most of which, from its elevated position, and the declivities of the land, would admit of easy and profitable reclamation. The extent of bog throughout the county is estimated at 171,054 acres. One species of it, called by the people meagh-bone, or fat turf, is of a highly inflammable quality, and is therefore used more to give light than heat: a small piece applied to a lighted candle burns like a wax taper.

The county contains a vast extent of unimproved pasture land, amounting on the whole to 727,000 acres, the greater portion of which is situate within the elevated mountain promontories, to the N. and S. of Dingle Bay; but large tracts of low, and comparatively improvable, boggy lands, are situate in a cold clayey country, extending from Tarbert on the Shannon, by Listowel and Castleisland, to Kil-

larney, many parts of which are highly improvable, and are similarly circumstanced, in every respect, with the crown lands of Kingwilliamstown, in the county of Cork, where extensive land improvements have been effected. Similar, and very successful improvements were also made to the W. of Listowel, in this county, by the late Mr Pierce Mahony, which prove what can be done at a moderate cost in an extensive district which is similarly circumstanced. It is probable that, of the entire extent of waste lands of this county, about 150,000 acres may be drained and reclaimed, so as to produce corn and green crops: 250,000 acres may be drained, both for the purposes of pasture and coarse meadow; and 327,000 acres, consisting either of mountain tops or deep flat bogs, may be deemed incapable of improvement under present circumstances.

The county was once covered with timber, much of which has been cut down for the supply of the iron-works; but there are still many fine tracts of wood; and, even where the land has been cleared, its re-growth is prevented solely by the cattle; for, wherever these are excluded, the trees shoot up from the old roots so vigorously as often to choke up the young plantations.

Kerry, in acreable extent, is the third largest county in Ireland; but if we deduct from its aggregate area the waste of mountain and deep bog land which could not be improved at a profit, the district engineer reports that it will be found that in no other county has so much been done in the way of drainage and improvement on a given surface of available land, or with better and more satisfactory results; for, probably in no part of Ireland has agriculture made more rapid progress, whether in dairy or mixed husbandry, which is mainly to be attributed to the large sums expended under the provision of the drainage acts; for, consequent upon the thorough drainage of the land, followed an improved system of husbandry. The occupiers have been enabled to introduce a better rotation of cropping, and by degrees to introduce a different and superior breed of stock, so that the produce on the improved farm, whether as regards cattle, sheep, or corn, has been very

Kertch. much increased, but the great feature in the change is the extended breadth of turnips annually sown, this being the principal crop whereby to judge of the progress of agriculture in any district, it being the foundation of all good husbandry. In districts where nothing has been done in the way of drainage, the old system of agriculture is still pursued in its primitive form of lazy-bed culture, and alternate croppings of oats and potatoes.

Tralee, the assize town, with good open streets, and many good houses, is the largest in the county, and was once the chief residence of the Earls of Desmond, and the place where they held their palatine court. On the ruin of that family, it was made the county town, and obtained a charter, with the right of returning two members to parliament, which it retained till the Union, when it was deprived of one of its members. Previously to that period, the constituency was limited to the burgesses, fifteen in number, who were nominated by the proprietor of the town, Sir Edward Denny. It now consists of about 315 burgesses and householders. The town suffered greatly in the civil wars of 1641 and 1688. Its situation on the River Lee, about a mile from Tralee Bay, is healthy and picturesque, but not well adapted for trade, as vessels above 300 tons can approach no nearer than the Samphire Islands, six miles distant. The court-house and jail form one side of a square in the centre of the town. The other public buildings are,—the church, which is a fine modern structure, two Roman Catholic chapels, the Methodist and Independent meeting-houses, the county infirmary, the new court-house, and an infantry barrack for 600 men. The remains of one of the four castles belonging to the Desmond family are still in existence. At some distance from the town is a celebrated sulphureo-chalybeate spa. The population in 1851 amounted to 9957. The next town in rank and population is Killarney, which owes its celebrity chiefly to the lakes in its neighbourhood; and there were formerly extensive iron and copper mines wrought here. Mennius states, that there were four circles of mines round this town; tin, lead, copper, and iron. Tin has not been found here in modern times. Lord Kenmare's seat is contiguous to the town. Its population is 5962. Dingle, a place of some trade, and a fishing station, contains 3262 inhabitants. The population of the other towns which have more than 1000 inhabitants each, is as follows:—Listowel, 2126; Castleisland, once the county town, but now a declining village, 1005; Tarbert, 1000; Ballylongford, a rising seaport on the Shannon, with a very improveable harbour, 1862; Cahirciveen, 1862; and Kenmare, at the head of the estuary of the same name, 1509. (H. S.—R.)

KERTCH, a fortified town and seaport of Russia, on the eastern coast of the Crimea, stands on a small peninsula at the mouth of the strait of Yeni Kaleh, about 10 miles S.W. of the town of that name. From its commanding position between the Black Sea and the Sea of Azof, it is, both in a commercial and military point of view, a place of considerable importance. The streets are regular, the houses well-built of stone, the harbour good, strongly fortified, and generally filled with shipping. All vessels entering the Sea of Azof do quarantine here for four days. Pop. about 10,000. The present town is built close to the site of the ancient Panticapæum, the last residence of Mithridates the Great. In the neighbourhood are numerous tumuli, some of them of enormous size, in which there have been discovered large quantities of Grecian antiquities of the most exquisite workmanship. The best part of these is at St Petersburg, but a very valuable collection, preserved in the museum at Kertch, was barbarously destroyed or pillaged by a mob of drunken soldiers, after the capture of the place by the allied forces of Britain and France in May 1855. Subsequent excavations by Dr D. M'Pherson brought to light what seems to have been the burying-place of the

Scythian kings, as described by Herodotus. The hill near the town is still called after Mithridates, who is said to have reviewed his troops from its summit, before his last expedition against the Romans. The peninsula of Kertch was colonized by Milesians about 500 B.C. About 50 B.C. it became part of the Roman empire, and in A.D. 375 it fell into the hands of the Huns. In 1280 it was occupied by the Genoese, who were driven out by the Turks in 1473. It was seized by the Russians in 1771, and formally ceded to them in 1774.

KESWICK, a market-town of Cumberland, 30 miles S. of Carlisle, is delightfully situated on the left bank of the Greta, close to the Lake of Derwentwater, and beneath the shadow of Skiddaw. It is one of the chief stations for visitors to the lakes, surrounded as it is by one of the finest landscapes in England. It was for many years the residence of Southey, whose house, Greta Hall, stands close by the river side. There is a monument to the poet in the parish church, a handsome building in the perpendicular style. Keswick is noted for its manufacture of lead pencils; the mineral, of the finest quality, is obtained in the neighbouring mines of Borrowdale. It has a public library and reading-room, and two museums illustrative of the mineralogy of the neighbourhood. Pop. 2618.

KESZTHELY, a town of Hungary, county of Szalad, near the W. end of Lake Balaton, 96 miles S. of Presburg. It is the seat of a very complete agricultural college, called the Georgicon, after its founder Count George Festetics. The inhabitants, numbering about 8000, are chiefly employed in the manufacture of wine and of woollen cloths.

KETSKEMET, a town of Hungary, county of Pesth, 50 miles S.E. of Buda. It is irregularly built, in the midst of a level country, which breeds large numbers of horses and cattle. The cattle-market is the largest in Hungary. The inhabitants are chiefly employed in the rearing of livestock, and in the manufacture of wine, soap, and leather. Pop. (1851) 32,308.

KETTERING, a market-town of Northamptonshire, is built on a slope near the Ise, a tributary of the Nen, 13 miles N.N.E. of the county town. The principal building is the church, a good specimen of the perpendicular style, with a fine old tower, surmounted by a crocketed spire. The principal manufactures are silk plush for hats, woollens, and shoes. Pop. 5125.

KEW, a small village and parish of Surrey, pleasantly situated on the right bank of the Thames, 6 miles W. of Hyde Park Corner. A stone bridge of seven arches connects it with Brentford, on the opposite bank. The great object of interest at Kew is the gardens. The old palace here, built in the time of James I., was long the favourite home of George III., who, carrying out the designs of his parents, greatly improved and enlarged the grounds. These, which embrace, inclusive of the Botanic Garden, an area of about 245 acres, were, in 1840, placed under the management of the Commissioners of Woods and Forests, and opened to the public. The Royal Botanic Garden, occupying about 75 acres, was begun by the Princess of Wales, mother of George III., and received continual additions during the reign of her son; but not till the recent improvements, under the able direction of Sir William Hooker, did the arrangements of the establishment entitle it to be regarded as one of the most complete in the world. The palm-house was, at the time of its erection, a wonder in architecture, being built of iron and glass, of the length of 362 feet, by a breadth of 100, and height of 66 feet in the central compartment. The whole of the grounds are laid out with admirable skill and taste. The most prominent object in the pleasure-grounds is a Chinese pagoda of 10 storeys, 163 feet high, and commanding an extensive view.

KEY, or **CAT**, a common name given to many of the

Keswick
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Key.

Key Islands on the coast of Florida and Central America. See **BAHAMAS**.

KEY ISLANDS. See **KI ISLANDS**.

KEY WEST, an island of the United States of North America, part of Monroe county, Florida, and one of the Pine group, forming the most southern territory of the United States, N. Lat. (of lighthouse) 24. 32. 58., W. Long. 81. 48. 7. It is 4 miles long by 1 in breadth at the widest part. Its position commands the trade of the Mexican Gulf, an advantage of which the government have availed themselves by constituting it a naval and military station. Like the rest of the Archipelago it is a coral formation, and has but a scanty soil. The climate, however, is so salubrious that Key West has become the resort of invalids from the Northern States. The inhabitants trade in wrecks, salt, sponges, and coral. Key West town has a safe and convenient harbour much resorted to. Pop. of town about 3000.

KEYNSHAM, a market-town of Somersetshire, at the confluence of the Chew and Avon, nearly equidistant (5 miles) between Bath and Bristol. It consists of one long street, and has a fine large church with a lofty tower. Pop. 2318, chiefly employed in maling.

KHAFALUN, a town of Tibet, at the junction of the Shayuk and Leh, 90 miles N.W. of Leh. Pop. about 12,000.

KHALKAS, one of the principal races of Mongolia, inhabiting the regions on the southern frontier of Siberia. See **MONGOLIA**.

KHANDESH, in Hindustan, a British collectorate of the presidency of Bombay, bounded on the N. by the territory of Holkar, on the E. and S. by portions of the Nizam's dominions, and on the W. by Guzerat. It is situated between N. Lat. 21. 22., and has an area of 9311 square miles. This district may be described as a valley or basin traversed by the River Taptee, which flows from E. to W., and flanked on the N. by the Sautpoora range of mountains, on the S. by the range on which are the fort of Chandore and the ghaut of Adjunta, and on the S.W. by the Syadree range. On the S.E. the boundary surface is but slightly elevated. According to the census of 1851, the population of Khandesh amounts to 778,112. Khandesh was governed in the beginning of the fifteenth century by independent sovereigns, who, claiming descent from the Khalif Omar, resided at Aseerghur; but, towards the close of the sixteenth century, it was subdued by Akbar, and annexed to the Mogul empire. Shah Jehan, in 1634, made a new arrangement, adding some districts to Candesh, and constituting the whole a sobbah or province of his empire. During the contests for power and dominion between the families of the Mahratta chiefs Holkar and Scindia at the commencement of the present century, Khandesh was reduced to the state of a desert; and, on the final overthrow of the Peishwa, in 1818, it was annexed to the British dominions. The Bheel chiefs, trusting to their mountainous and jungly recesses, for some time continued refractory. They were dislodged from many of their retreats by the vigilance of British officers, who were long engaged in this harassing warfare; but in 1825 it was determined to adopt a more conciliatory line of conduct, and the province, in a short time, was restored to a state of perfect tranquillity. The district was combined with that of Ahmednuggur until 1849, when it was detached and formed into a separate zillah.

KHANIA, or **CANEA** (*Cydonia*), the chief commercial town of Candia, and capital of a sanjak of the same name, is situated on the N.W. coast of the island, surrounded by a fertile and beautiful country. It is well built and strongly fortified, and has the best harbour in the island. The principal exports are oil, soap, wax, silk, fruit, &c. Soap is extensively manufactured. Pop. about 8000, the majority of whom are Mohammedans.

KHARKOV, or **CHARKOV**, a government in the S. of European Russia, lying between N. Lat. 48. 30. and 51. 20., and E. Long. 34. 20. and 38. 20. It is bounded N. by the government of Noursk, E. by Voronez, S. by Ekaterinoslav, and W. by Poltava. Area, 20,900 square miles. The surface is generally flat, and not much wooded. The soil is very fertile, and in ordinary years about one-fourth of the quantity of corn produced is exported. Flax, hemp, tobacco, hops, and potatoes, are also grown. Bees are abundant, and cattle-rearing receives a considerable degree of attention. The principal rivers are the Donetz and Oskol, neither of which is navigable. With the exception of distilleries, which are numerous, the industrial establishments are few and unimportant, the principal being tanyards, saltpetre-works, and tallow-melting houses. Pop. (1851) 1,366,188.

KHARKOV, the capital of the above province, is situated at the confluence of the Kharkov and Lopan, in N. Lat. 49. 59., E. Long. 36. 26. The town is composed of narrow and crooked streets of wooden houses. The ramparts by which it was formerly surrounded have been converted into gardens and public promenades. It is the seat of the provincial courts, and has a cathedral, university, ecclesiastical seminary, military academy, and other educational institutions. The university (founded in 1803) had, in 1854, 75 professors, and 457 students. It has a library of 25,000 volumes, a botanical garden, and a museum. Kharkov carries on a considerable trade, and has four great annual fairs. Pop. (1851) 24,933.

KHARTOOM, the capital of the Egyptian province of Beled-es-Sudan, is situated on the W. bank of the Bahr-el-Azrek, or Blue River, about 1½ mile from its junction with the Bahr-el-Abiad, or White River. At the beginning of the present century only a few huts occupied the site of the present town; but when, in 1822, this territory became an Egyptian province, Khartoom was fixed upon as the seat of government. Being favourably situated near the junction of two large rivers, and near the great caravan route from Darfur and Kordofan, it carries on a very extensive trade. The White River brings into it, from the most distant parts of the country, ivory, ostrich-feathers, gum, &c.; while gold, coffee, senna, and tamarinds, are brought by the Blue River. These articles, as well as slaves, are thence conveyed to Cairo, the Red Sea, and Mediterranean. Pop. estimated at about 20,000.

KHATMANDU. See **CATMANDOO**.

KHERSON, a government in the S. of European Russia, on the N. shore of the Black Sea, between N. Lat. 46. 10. and 49., and E. Long. 29. 20. and 34. It is bounded N. by the governments of Kiev and Poltava, E. by Ekaterinoslav and Taurida, S. by the Black Sea, and W. by Bessarabia and Podolia. It is about 250 miles in length from E. to W. by 180 miles in breadth, and has an area of 28,280 square miles. With the exception of the S.W. part, where are some of the last ramifications of the Carpathians, and a hilly portion in the N.E., the government consists almost entirely of an immense steppe, destitute of trees, but covered with long grass. In the S.W. and N.E. parts there are considerable forests. The Dniester flows along a great part of its W. border, and the Dnieper along its E. The principal of its other rivers is the Bug, which flows southward through the territory, dividing it into two not very unequal parts. The climate is very variable, and characterized by extremes both of heat and cold. Agriculture is but little attended to, the country being much better adapted for pasturage. The sheep are numerous, and of a superior breed. Among the horned cattle, buffaloes are common. Wild animals are abundant, especially wolves and wild cats. Flax, hemp, tobacco, saffron, and liquorice, are cultivated. Several varieties of the vine are cultivated, and wine of an inferior quality is made. The fisheries are important, both on the sea-coast and in the rivers. Its

Kharkov
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Khereson.

Kherson commerce, carried on at Odessa and Kherson, is very extensive. Pop. (1851) 889,205.

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Khiva.

Kherson, the capital of the above province, is situated on the right bank of the Dnieper, 90 miles E.N.E. of Odessa. It was founded in 1778, and fortified in 1780, and soon rose to be a place of importance; but the want of sufficient depth of water for large vessels, and the rise of Odessa with superior advantages for trade, led to its decline. It is divided into four parts—the citadel, the admiralty, and the Greek and military suburbs. The first contains the different government offices, cathedral, arsenal, barracks, and prison. In the admiralty quarter are extensive docks, building-yards, and storehouses, but these are now little used. The trade of the town is inconsiderable, with the exception of that in timber. Howard, the philanthropist, died here in 1790; and over his grave, about 3 miles N. of the town, is an obelisk erected by the Emperor Alexander. Pop. (1851) 24,338.

Khiva, a kingdom or khanat of Turkistan in Asia, bounded on the N. by Ust-urt and the Sea of Aral, N.E. by the Desert of Kizil Koum, E. by Bokhara, S. by Merve and Persia, and W. by the Caspian Sea. Its extent is variously estimated at 150,000 to 450,000 square miles. It is for the most part a series of arid steppes broken by oases of various magnitude. Of these, the most important—constituting the khanat properly so called—is a narrow tract lying on the W. bank of the Oxus (now called the Amou Deria, or Jihun), along the lower part of its course. It is in length about 150 miles, and in area about 4000 square miles, watered by innumerable canals, carefully cultivated, and thickly inhabited. The climate of Khiva is dry, and, on the whole, healthy, though the extremes of summer heat and winter cold are considerable. The clearness of the sky is specially remarkable. The soil is naturally arid, but irrigation and manure have rendered it very productive. Among the principal vegetable products are wheat, barley, rice, millet, cotton, the mulberry, vine, apple and apricot, peas, lentils, melons, potatoes, &c. The country generally is destitute of wood, but the region on the E. side of the Oxus produces forest trees. The Sheik-Djeli, a range of hills running parallel to the Oxus, between Lat. 42. 20. and 40. 35., are said to contain gold and copper, but these minerals are not worked. Limestone, salt, and sulphur, are found in quantities sufficient for economic use. The numbers of the population are very variously estimated—by some authorities at 200,000, by others at 2,000,000. Slavery is general; and the power of the khan is absolute. The capital, Khiva, is a collection of low mud houses, containing from 5000 to 10,000 inhabitants. The manufactures and commerce of the country are inconsiderable, the stationary population being chiefly occupied in agriculture; while the Turkomans live, for the most part, by cattle-breeding and plunder. Some cotton, woollen, and silk stuffs, earthenware, &c., are made and exported; about 2000 camels' loads of agricultural produce, silk, &c., are annually sent to Orenburg, Astrakhan, and Cabul. The chief trade is with Russia and Bokhara, and none but Mohammedans are allowed to traffic within the khanat. The Khivans are of the Sunnite persuasion—one great cause of enmity between them and the Persians.

Khiva is part of the ancient Chorasmia, or Kharazm; which, after owning the sovereignty of China and Persia, was an independent kingdom from the tenth to the thirteenth century. In 1221 it was conquered by Genghis Khan, from whose descendant it was wrested by Timur in 1379. Early in the sixteenth century it was overrun, with the rest of Turkistan, by the Uzbeks, the race which has continued dominant there to this day. Their language is the Turkish. Nearly equal to them in numbers are the Tanjiks or Sarts, a Persian race, said to be the original inhabitants. The nomadic tribes are the Turkomans or

Trukmans, the Karakalpaks, and the Kirghiz. Of these, the Turkomans are the least subordinate to the khan. They rear large herds of horses (prized for their beauty), cattle, and sheep, but are still fonder of plunder and kidnapping. The number of Russian subjects detained as captives in Khiva moved the Czar, in 1839, to send an expedition against the khan. The difficulties of the march prevented it from reaching its destination, but since then the Russians have been permitted to erect forts on the line of their caravan route into the territories of the khan. The extension of their frontier in this direction is probably only a matter of time.

KHOI, a walled town of Persia, province of Azerbaijan, on a tributary of the Kar, 15 miles N. of Lake Urumiah. It is situated in a very fertile district, and is described as one of the best built towns in the Persian empire. The streets are wide and regular; and are shaded by rows of trees. Khoi carries on a considerable trade between Turkey and Persia. In the plain of Khoi, Shah Ismael signally defeated the Turks under Selim I., in 1514. Pop. about 15,000.

KHOJEND, a town of Independent Turkistan, Central Asia, and Khanat of Khokan, on the Jaxartes, 90 miles W. of Khokan. It is surrounded by walls and wet-ditches, and intersected by canals. It manufactures coarse cotton goods, and carries on a considerable trade in these, and Russian merchandise. Caravans entering the Khanat from Bokhara pay toll at Khojend.

KHOKAN, **KOKAN**, or **FERGHANA**, a khanat of Independent Turkistan, Central Asia, between N. Lat. 40. and 45., and E. Long. 67. and 75.; bounded N. by the Kirghiz Steppe, E. and S.E. by Chinese Turkistan, S. by Bokhara and the tableland of Pamere, and W. by the Kara-kalpak territory. It is for the most part mountainous, comprising part of that lofty region which forms the W. wall of the great plateau of E. Asia. The principal river is the Jaxartes or Syr, which flows at first westward, and afterwards northward, through the territory, dividing it into two nearly equal parts. The plains and valleys near the Jaxartes, or its tributary streams, are generally rich and fertile, while in other parts, the land is comparatively arid and sterile. Khokan is more of a pastoral than an agricultural territory, although there are many cultivated spots scattered over its surface. One of the chief productions of the country is silk, for which it has long been famous. Cotton is another of its staple productions. Corn, and the various fruits of Europe, especially grapes and melons, are grown. The hills are covered with pine, poplar, almond, walnut, pistachio, and other trees. Large flocks of sheep are pastured here, and wool constitutes an important article of export. The climate is one of extremes; in summer, heat is great and parching, and little rain falls till towards the end of harvest, while the winter is very severe, though there is not much snow. The mineral products are coal, iron, copper, jasper, lapis-lazuli, &c. The chief manufactures are silk and cotton stuffs. The inhabitants are mostly Uzbeks, who are shepherds; and a few Tanjiks, who live in villages, and are described as a stout, fair, and high-complexioned people; quiet and hospitable; and fond of the chase. There are also several wandering tribes of Kirghiz.

KHOKAN, the capital of the above khanat, is situated on the left bank of the Jaxartes, 230 miles N.E. of Samarcand, and about the same distance N.W. of Kashgar. It is an open town, the palace only being surrounded by a mud wall. The streets are unpaved and narrow, and the houses mostly of mud. It has numerous mosques, and several bazaars and caravansaries. The chief manufactures are silk and cotton stuffs; and the trade in cattle and silk is considerable. The vicinity is fertile and well cultivated. Pop. about 50,000.

KHOOLOOM, **KHULM**, or **TASH-KURGAN**, a town of Central Asia, khanat of Koondooz, on the Khooloom River,

Khoi

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Khooloom.

Khorasan. a tributary of the Oxus, and on the high road between Balkh and Koondooz, 40 miles E. by S. of the former, and 68 W. by S. of the latter; N. Lat. 36. 38., E. Long. 68. It is surrounded by mud walls, and defended by two forts of the same material. Pop. about 10,000.

KHORASAN, or **KHORASSAN** (*Country of the Sun*), a province of Persia lying between N. Lat. 34 and 38, and E. Long. 53. and 61., and bounded on the N. by Khiva, E. by Afghanistan, S. by Yezd, and W. by Irak-Ajemi and Mazanderaun. Its boundaries, however, have varied much at different times. It has never been a great and independent empire; but frequently the loosely attached province of a dissolving state, and the scene of invasion, rebellion, and anarchy. It has formed a frequent subject of dispute between the independent monarchs whose territories lay on the E. and W.; and it was sometimes in the power of one and sometimes of the other. At one time it extended N. to the Oxus, including Kharazm and Balkh, E. to Candahar, S. to Kerman and Seistan, and W. to the districts of Ispahan, Cashan, and Rhe.

The surface of this province, like other parts of Persia, is much diversified by plains and mountains. A very large portion of it is quite unfit for the habitation of man, and consists of arid rocks, destitute of vegetation or fresh water, and deserts, either of salt land or sand, among which are to be found a few fertile oases. The Elburz range of mountains crosses the northern part of the province in an easterly direction, sending forth various ramifications to the southward. From the base of these mountains a desert of barren sand stretches northward to a great extent, including the steppe of Kharazm, and forming part of that immense plain which extends eastward as far as the Jaxartes and the Oxus. In this plain are many fertile districts, but in that portion of it belonging to Khorasan there is no permanent habitation, and its scanty population comprises only a few tribes of wandering Turkomans. At the foot of the mountains, however, are many fertile and well-watered valleys, which were formerly well-peopled and cultivated, and once contained several large towns, which are now deserted and in ruins, in consequence of the incessant attacks of the plundering Turkomans. To the S. the Elburz Mountains send forth ramifications which penetrate from 60 to 100 miles into the plain. Beyond this is the vast salt desert, which extends southward, with occasional fertile tracts, very nearly to the Persian Gulf. This desert varies very much in its nature in different parts. In some places the surface is dry, and even produces a few of those plants that thrive in a salt soil; in others it consists of a cracking crust of dry earth, covered with a saline efflorescence. There are extensive marshy tracts, in the lower parts of which water accumulates during the winter months, which is evaporated by the summer sun, leaving a quantity of salt in cakes, upon a bed of mud. In some places the soil is a hard-baked and perfectly barren clay. Again, in certain districts, extensive plains of sand are found, which is occasionally heaped up in hillocks in the form of waves, and frequently so light as to be raised aloft by the wind in clouds, under which travellers are frequently buried, as in the Arabian deserts. The saline desert, however, according to Fraser, predominates in Khorasan. It is of a considerably higher level than the desert to the N. of the Elburz Mountains; but still this traveller is of opinion that they are connected. The only fertile parts of Khorasan are where the country is penetrated by the Elburz Mountains; and in the N.E. corner of Khorasan there is a long stripe of country, consisting of the lower parts of these mountains, from 10 to 20 miles in breadth, which bear some inconsiderable traces of cultivation, and give shelter to a few miserable hamlets, but contain no village of any consequence. The valley of Meshed, amongst the Elburz Mountains, is of great length. It commences 10 or 12

miles to the N.W. of Sheerwan, extends without interruption for 50 miles beyond Meshed, and continues for the greater part of the way to Herat. It varies from 12 to 30 miles in breadth, and contains in its extent, beside the city of Meshed, the towns of Chinnaran, Radcan, Koukan, Sheerwan, and their dependencies, with a great extent of cultivated land. The road from Meshed to Herat also passes through several well-peopled and well-cultivated districts. The extensive valley here spoken of contains a considerable portion of the district known by the appellation of Kurdistan, being inhabited by Kurdish colonies. The cultivated parts of the province produce wheat, rice, tobacco, cotton, hemp, assafoetida, and most of the fruits of Southern Europe. The rearing of cattle is the chief employment of the nomad tribes that roam over the desert. The camels and goats of Khorasan are celebrated for their fine soft hair, which is a valuable article of trade. The chief towns are Meshed or Mushed, and Nishapoor.

KHOSRU, or **KROSREW** I., called *Chosroes* by the Greeks, and surnamed *Anushirwan*, "generous spirit," succeeded his father, Cobades or Kobad, as King of Persia, A.D. 531, and reigned with great glory and success till 579. He is justly entitled to be looked upon as one of the greatest of all the kings of Persia. As a warrior he proved himself able to cope with the best armies and most skillful generals of Rome. So terrible was his name, even to that warlike people, that the emperors were glad to purchase peace by the payment of a heavy annual tribute. He carried his conquests eastwards to the Indus, and northwards to the Oxus. Native historians dwell with pride on the embassies that came from the distant kingdoms of Africa, India, China, and Tibet, to solicit his friendship and gain his good will with valuable gifts. Feared abroad, he was respected and beloved at home, and the Persians look back upon his reign as the golden age of their history. His virtues, and more especially his justice, dwell in their memories. Science, literature, trade, and agriculture found in him a sure and constant patron. Academies and libraries were founded in the chief cities of his kingdom; and the masterpieces of Sanscrit, Greek, Latin, and Hindoo learning were, by his orders, translated into the Persian tongue. Among other translations which he caused to be made may be mentioned that of the *Indian Fables* of Pilpay, from which the versions in most of the European tongues have been taken. Among his countrymen Khosru holds a place analogous to that held by Alfred among Englishmen, or by Charlemagne among the Franks. (For the details of his life and reign, see **PERSIA**.)

KHURD-CABUL, a village of Afghanistan, situate in a pleasant valley, 16 miles S.E. of Cabul, and 7466 feet above the sea-level. Here, in 1841, the British troops, retreating from Cabul to Jelalabad, became totally disorganized, and were murdered without resistance by the Afghans; and here, in 1842, General Pollock encamped after the decisive defeat of the Afghans at Tezeen.

KHUZISTAN, a province in the west of Persia, lying between N. Lat. 30. and 33., and E. Long. 47. and 51; and bounded on the N. by Luristan, E. by Fars, S. by the Persian Gulf, and W. by Asiatic Turkey. It is about 200 miles in length from N.W. to S.E., and 140 in breadth. The southern part of the province consists of vast sandy plains and morasses wholly destitute of vegetation. The shores of the gulf are in winter a swamp, and in summer a parched desert. Farther inland are some rich alluvial tracts, well adapted for cultivation. The N. and E. parts of the province are mountainous, with many beautiful and fertile valleys. The rivers Tigris and Euphrates form its western boundary. The principal of its other rivers are the Kerah, the Karun, and the Jerahi. Wheat, barley, rice, dates, indigo, cotton, and tobacco are produced. The chief towns are Shuster and Dizful.

Khosru
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Khuzistan.

Khyrpoor
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Kiangsee.

KHYRPOOR, a town of Hindustan, in the province of Scinde, consisting of a collection of mud hovels, with a few houses of better description scattered about. The population is estimated at 15,000 souls. Khyrpoor is the principal place of the district of the same name. When Scinde was subjugated by the British, a large measure of favour was extended to one of the Khyrpoor Ameers, Ali Murad, on the ground of his early and consistent adherence to the cause of the conquerors, and it was proposed to confirm him, not only in his patrimonial lands, but also in others which had passed into his possession by virtue of a treaty executed in 1842, when he vanquished his brother and nephew, and obtained certain cessions as the price of farther forbearance. The extent of these cessions was open to question, but Ali Murad having persuaded Sir Charles Napier to adopt that view which best promoted his interest, was admitted to all he claimed. Suspicion, however, was never altogether lulled; and subsequent inquiry proved the Ameer's claim to rest on fraud and forgery. The treaty had been written, according to Mohammedan custom, upon a leaf of the Koran, and the extent of territory transferred being very small, Ali Murad, by interpolating some words, contrived to convey to himself considerable districts, in place of small villages. Fearing, however, that some curious eye might detect the interpolation, he subsequently removed the leaf, and caused its place to be occupied by another, bearing record to the like effect. This was established before a British commission on the 5th January 1853, and on evidence which could not be doubted. Only one result could reasonably follow, and Ali Murad was of necessity deprived of his ill-gotten acquisitions, which were incorporated with the rest of Scinde, as part of the British empire in India. He was, however, permitted to retain the lands allotted to him by his father, an act, not of justice, but of liberality. Since his connection with the British government, Ali Murad has abolished slavery within his territory. Khyrpoor is about 13 miles S.W. of Roree, the road from which place is good. Lat. 27. 3., Long. 68. 48.

KI, or **KEY ISLANDS**, a group in the Indian Archipelago, between Lat. 5. 6., Long. 132. 133. The principal islands are Great Ki, Little Ki, and Ki Watela. The first is about 50 miles long, and rises into mountains covered with forests. On the W. of Little Ki, which is level, is the large harbour of Doola, where shipbuilding and some trade with the Banda and Celebes Islands are carried on. The principal exports are provisions and cattle. The inhabitants are mostly Mohammedans, and are said to be somewhat civilized.

KIACHTI, or **KIACHTA**, a town of Siberia, government of Irkutsk, on the Kiachta, a small affluent of the Selenga, 180 miles S.E. of Irkutsk. Kiachti is situated close to the Chinese frontier, and is the great emporium of trade between Russia and China. It consists of an upper and lower town; the former contains the public offices, barracks, &c.—the latter, about 2 miles farther S., is inhabited chiefly by merchants. On the Chinese side, and within a mile of the lower town, is the Chinese village of Mai-Maitchin with which the chief traffic of Kiachti is carried on. A great fair is held annually between the two places in December. The Russians exchange furs, leather, broad cloths, coarse linens, bullion, glass, cattle, &c., for tea, manufactured silks and cottons, china-ware, rhubarb, toys, and other Chinese produce. In 1843 the Russians imported through Kiachti, 102,700 chests of tea; and the value of woollen and cotton goods, leather and furs, received by the Chinese merchants in that year amounted to above L.677,200. This, however, is about double the amount of trade in ordinary years—the great increase being occasioned by the English war with China. Pop. about 5000.

KIANGSEE, a province of China, to the N. of Canton, surrounded on the E. and S. by mountains, and traversed

by the Kan-Kiang, which, in the N of the province, forms the Po-yang-hu Lake. The valley of the Kan-Kiang is a highly productive region. The porcelain of this province is of the first quality; it is manufactured on an immense scale at King-te-ching, a large town to the N.E. of Lake Poyang. Capital, Nan-Cang-foo. Pop. 33,000,000. Area, 72,000 square miles.

KIANG-SU, a maritime province of China, bounded E. by the Yellow Sea, S.W., N.W., and N., by Tche-Kiang, Nganhoei, Honan, and Shantung. Area, 44,500 square miles. It is one of the most fertile provinces in China, and possesses unusual facilities for commerce, being traversed by the great rivers Hoang-ho, and Yang-tse-Kiang, and from S.E. to N.W. by the Imperial Canal. The surface is mostly level, and a great portion of the coast is protected by dikes from the incursion of the sea. Marshes and lakes are numerous; of the latter, which abound in fish, the largest are the Hong-tse-hu, the Kan-yu-hu, and the Tai-hu. The chief products of the province are silk, cotton, tea, rice, &c., of which large quantities are exported. The principal cities are Nankin, Shang-hai, Yang-tchu-fu, and Su-tchu-fu. Pop. above 38,000,000.

KIDDERMINSTER, a market-town and municipal and parliamentary borough of Worcestershire, on the Stour, near its junction with the Severn, 13 miles N. of Worcester. It is irregularly built, and most of the houses are small, but the streets are well paved and lighted. The best building in the town is the parish church, a fine old structure in the perpendicular style, with a tower. There is a free grammar school, with a revenue of about L.580, but indifferently attended. The total number of pupils at all the schools is about 1000; there are three literary institutions. Kidderminster has been celebrated for more than a century for its carpets, in the manufacture of which extensive improvements have been introduced within the last few years. Bombazeens, waistcoatings and damask, and silk goods are also made here. There are some tanneries, breweries, &c. The Stafford and Worcester Canal, and the Oxford, Worcester, and Wolverhampton Railway pass by the town. It returns one member to parliament. Constituency in 1856, 511. Pop. 18,462. Kidderminster was at one time the property of the poet Waller, and enjoyed for many years the pastoral ministrations of Richard Baxter.

KIDDERPORE, in the British district, called the Twenty-four Pergunnahs (Bengal Presidency), a small town almost adjoining Calcutta, of which it may be regarded as a suburb. It is described by Heber as a large village, in the vicinity of which are several considerable houses inhabited by Europeans, and considered to be remarkably dry and salubrious. There is here a dockyard formerly belonging to Mr James Kyd, but now the property of government. A factory has recently been erected, and thus the means are concentrated within the dock establishment for the efficient repair of the government steamers. Distance from Fort William, S.E. 4 miles. Lat. 22. 30, Long. 88. 22.

KIDWELLY, a small but ancient seaport-town of Caermarthenshire, South Wales, on the Gwendraeth-Vechan, 9 miles S. of Caermarthen. It has a fine old church and Norman castle, both partially in ruins; the latter overlooks the town from a rocky height on the W. of the river. The trade of the place is trifling. Pop. of parish 1648, chiefly employed in smelting iron and tin.

KIEFF, **KIEV**, **KIEW**, or **KIOW**, a government of European Russia, bounded N. by Minsk, E. by Tchernigov and Poltava, S. by Kherson, S.W. and W. by Podolia and Volhynia; area 19,000 square miles. The general surface is flat or undulating, with some low ranges parallel to the river courses. The principal river is the Dnieper, which divides the province from Tchernigov and Poltava about 250 miles of its course. Its chief tributaries are the Pripetz, Testerev, Irpen, Stugena, Ros, and Tiasmin. The climate is remark-

Kiang-Su
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Kieff.

Kieff
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Kiel.

ably temperate, though the summer heat is often extreme. The population, amounting in 1850 to 1,638,000, are chiefly occupied in agriculture and cattle-breeding. The peasants are mostly serfs. The vegetable productions include grain of all kinds, hemp, flax, and tobacco. Excellent timber grows extensively in the north. The cattle are large and of good breed, and are fattened in great numbers for exportation. The manufactures are unimportant, the most extensive being that of beetroot sugar. Trade is chiefly in the hands of the Jews, who are numerous.

KIEFF, the capital of the above government, is picturesquely situate on several eminences on the right bank of the Dnieper, 650 miles S. of St Petersburg. It consists of three different towns—the Old Town, the Petscherskoi, or New Fort, and the Podole, or Low Town—each separately fortified, but all surrounded by a common intrenchment. The old town is built on a steep hill, separated from the Petscherskoi by a ravine. This was the ancient residence of the grand dukes of Kieff, and contains the cathedral of St Sophia, founded in 1037 by Jaroslav Vladimirovitch, whose marble tomb is within the archiepiscopal palace, and the convent of St Michael. The Petschersk, or citadel, occupies a still higher eminence to the S. of the old town. It is very strongly fortified, and contains a large arsenal, the residences of the civil and military governors, and the famous monastery of Petscherskoi, said to have been founded by St Anthony in the ninth century. The chief object of interest within the walls of the monastery is the church of the Assumption, which is magnificently decorated internally, and is surmounted by a belfry 304 feet high, surrounded by seven turrets with gilt cupolas connected by gilded chains. In the catacombs are preserved the bodies of upwards of 100 Russian saints. This monastery is yearly visited by thousands of pilgrims. The Podole, or Low Town, which occupies the level between the hills and the river, is the largest, but least picturesque portion of the city, and is the residence of the middle classes and trading population. It is regularly built, with wide streets interspersed with trees, and contains an imperial palace, an ecclesiastical academy (founded 1661, and very largely attended), and an exchange, with a hall capable of accommodating 3000 persons. A magnificent suspension-bridge connects it with the opposite bank of the Dnieper, which sometimes overflows the lower part of the town.

Kieff is the seat of the governor-general of Little Russia, and of the Archbishop of Kieff and Galitz. The university of St Vladimir, founded in 1833, has a large library, museum, and observatory, and, in 1846, had about 80 professors and 600 students. The principal manufactures are earthenware and leather. There is a large trade with Odessa and the interior, and the great annual fair in January draws visitors from all parts of Europe. Pop. about 50,000.

This city is of unknown antiquity. In the ninth century it became the seat of the power founded by the Varangian Rurik. Here Christianity first found a footing among the Muscovite barbarians. In the eleventh and twelfth centuries it was the capital of the empire. After many reverses, and successive occupations by Poles, Lithuanians, and Tartars, it was finally ceded to Russia in 1686.

KIEL, a seaport of Denmark, capital of the duchy of Holstein, is finely situated on a narrow peninsula surrounded on three sides by the Kielerfiord, a lake-like arm of the Baltic, 54 miles N. of Hamburg. It is well built and walled, and the environs and wooded banks of the bay afford numerous picturesque views of the surrounding country and the sea. The principal public buildings are the Glücksborg palace—the church of St Nicholas, an ancient edifice with a lofty tower—the university, and the convent church. Kiel is the seat of the Schleswig-Holstein State Assembly; and has a university, founded in 1665, with a large library, museum, botanic garden, and observatory. The excellence

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Kildare.

of its harbour, which affords safe anchorage near the town for the largest ships, and its position in the line of communication between the Baltic and German Ocean (by the Kiel Canal), have raised Kiel into commercial importance. In a political point of view, as the only great military haven on the S. coast of the Baltic, it is of still greater importance. A railway communicates with Altona and Hamburg, with branches to Rendsborg and Glücksborg, and steamers ply regularly to all the principal Baltic ports. The chief manufactures are sugar, soap, tobacco, ironmongery, hats, &c. Among the chief articles of trade are sprats and red herrings. Pop., including the suburbs, about 15,000.

KIL, a geographical prefix, said to be derived from a Dutch word, signifying a stream. It is, however, more probably the corruption of a Celtic word, meaning a grave. It occurs chiefly in Scotch and Irish names, as Kilcreggan, Kilkenny.

KILBARCHAN, a small town of Renfrewshire, 11 miles W. of Glasgow. Pop. 2467, principally employed in weaving tartans, &c., for Glasgow and Paisley.

KILBIRNIE, a small town of Ayrshire, on the Garnock, 17 miles S.W. of Glasgow. Pop. 3399, employed in cotton spinning and weaving, flax-spinning, bleaching, rope-making, and iron-smelting and founding.

KILCREGGAN, a watering-place on the Clyde, coast of Argyleshire, between Gare Loch and Loch Long, 24 miles W. of Glasgow.

KILDA, St (originally HERR), the farthest west of the Scottish Hebrides, is a small and rocky island in the Atlantic, above 100 miles W. of the Butt of Lewis, in N. Lat. 57. 50., W. Long. 8. 35. It consists of an irregular mountain ridge, about 3 miles long by 2 in breadth, and, with the neighbouring islets, presents from the sea an outline singularly varied and picturesque. The highest point, Conachan, is 1450 feet above the sea, and on its western side descends almost perpendicularly to the water. With the exception of a fine bay on the N.E. side, and a smaller opening on the S.W., the coast of the island presents a nearly uninterrupted front of lofty precipices, broken in some places into fantastic peaks, in others hollowed into enormous caves. At the head of the eastern bay, which is well sheltered by the rocky promontories on each side, is the small village, consisting of about 30 houses, to which the population is confined. The inhabitants, in number about 100, are a simple, kind, and active race. They cultivate as much land as is requisite to provide a moderate supply of barley and oats; but their main employment is the capture of the wild-fowls, which from February to October cover the rocks in myriads. The birds mostly caught are the solan goose, the fulmar (or greater puffin), and the common puffin. Of these a supply is salted for winter provision: the feathers, in which principally the rent is paid, are preserved and exported once a-year. The annual visit of the factor affords the only regular means of communication with the rest of the world. Despite their lonely condition, the dangers of their occupation, and their frequent privations in respect of fuel and food, the inhabitants of St Kilda are much attached to their native rock, and very few cases of migration have ever occurred. Most of their infants die of a peculiar malady, which attacks them generally on the eighth day after birth. They have enjoyed since 1705 the services of a resident clergyman, who is at once schoolmaster, pastor, and patriarch of the island. A diminutive breed of ponies was at one time reared in considerable numbers; it is now all but extinct. The native cows are small, but yield excellent milk; the sheep, which number about 2000, are mostly of Danish breed, small, and generally of a dun colour. The surrounding waters abound with fish, but the inhabitants confine their exertions to dry land. (See Martin's *St Kilda*, and Wilson's *Voyage*.)

KILDARE, an inland county in the province of Leinster, in Ireland, is bounded on the N. by the county of

Kildare. Meath, on the E. by those of Dublin and Wicklow, on the S. by that of Carlow, and on the W. by the King's and Queen's counties and Westmeath. With the exception of a small tract of hilly land, situated between Naas and Blessington, on the eastern side of the county, Kildare presents an unusually flat surface, few portions of which reach an elevation of 300 feet above the level of the sea. This county contains altogether about 52,000 acres of uncultivated land, of which 44,000 acres consist of extensive flow bogs, being a part of the Great Bog of Allen. It has been well ascertained that bogs of this description are susceptible of cultivation, both for corn and green crops, when perfectly drained, and covered with clay and limestone gravel, which occurs abundantly along the bog edges; but it is impossible, without great exertion, and the expenditure of considerable capital, to coat the surface of the bog with gravel at a greater distance from the edge than half an English mile. It appears probable that not more than one-third of those bogs are capable of being improved for cultivation, but that the whole may be drained at a moderate expense, and thereby rendered, to a certain degree, profitable, not only for pasture, but for fuel. Including the bogs and hilly pasture, this county contains about 16,000 acres capable of improvement for cultivation; 31,000 acres may be drained for coarse pasture; and 5000 acres which would not repay the expense of draining. According to the Ordnance Survey Kildare comprises a total area of 418,436 acres, of which 356,786 are arable, 51,854 uncultivated land, 8288 are in plantations, 490 occupied by towns and villages, and 1017 under water. The annual value, according to Griffith's *Valuation*, is L.313,494.

Some writers, in the time of Ptolemy, assert that the Eblani were the inhabitants of this county; others, amongst whom is Whitaker, make it the habitation of the Coriundi. Afterwards it formed part of the territory of Cealan or Galen, which likewise extended over some parts of Wicklow and Carlow. Its present name is derived from Chille or Kill Dara, the forest or church of oaks, the country being formerly covered with trees. The principal family in this district, previously to the arrival of the English, was that of the O'Kellys, whose residence was at the Moat of Ardscull, near Athy. On the death of Dermot M'Murrough, the last king of Leinster, which occurred shortly after the settlement of the English, this county formed part of the palatinate of Leinster, granted by Henry II. to Strongbow. When this extensive inheritance was distributed into five portions, amongst the daughters of William, Earl Marshal, who derived from Strongbow, by intermarriage, through his only daughter, Kildare fell to the lot of Sybilla, the fourth daughter, who married William de Ferrers, Earl of Derby, from whom it descended by marriage to the family of De Vesci, and thence by attainder to that of the Fitzgeralds or Geraldines. The principal families which held under Strongbow and his descendants were those of De Hereford, Fitzhenry, Phepoe, Pippard, D'Angulo or Nangle, and Bermingham. The Fitzgeralds ultimately became possessed of the greater portion. It was one of the twelve counties into which King John, on his arrival as lord of Ireland, divided that part of the island which acknowledged the English jurisdiction, but was not finally separated from the adjoining county of Dublin, to which it had been attached as a liberty, until the close of the reign of Edward I., when it was empowered to have sheriffs and courts of its own. The county is now divided into the fourteen baronies of Carbery, Clane, Connell, Ikeathy, Kilcullen, Kilkea and Moone, North and South Naas, East and West Narragh, East and West Offaley, and North and South Salt. These baronies are subdivided into 116 parishes.

According to the ecclesiastical arrangements, the county is partly in the diocese of Kildare, and partly in that of Dublin. Kildare diocese extends also into the King's and

Queen's counties. The bishopric was founded in the sixth century by St Conleth, who was buried near the great altar of his own church. The bishop took precedence of every other except Meath; all the rest ranking according to the dates of consecration. The episcopal income was latterly extremely small, amounting only to L.520 a-year; neither was there any episcopal residence, so that, in order to supply the deficiency of his revenue, the bishops of Kildare held the deanery of Christ Church *in commendam*. The city of Kildare is a small, poor place, wholly unworthy of notice, except from the circumstance of being the seat of the bishopric, and from the cathedral, and some monastic remains still existing. In accordance with the provisions of the Church Temporalities Act, on the decease of the late bishop the see of Kildare was united to the archbishopric of Dublin.

By much the greater part of the county is flat, interrupted only by a range of low hills in the centre, the most northern of which is the Hill of Allen, and the southern those of Dunmurry: the land on the eastern boundary, toward Dublin and Wicklow counties, gradually rises as it approaches the adjoining mountain tracts. The Boyne rises in a bog or marshy ground to the N. of Carbury, a branch of the Great Bog of Allen. The Lesser Barrow also rises in the Bog of Allen, and unites with the Greater Barrow near Rathangan. The Grees and Lane are small branches of this latter river, joining it near the southern extremity of the county. The Barrow forms the western boundary of the county, except in the neighbourhood of Athy, where it becomes navigable, and is known by the name of the Barrow Navigation. The Liffey enters the county from the W. near Ballymore-Eustace; and after sweeping through it, at first in a western and then in a northern direction, by Kilkullen Bridge, Clane, and Celbridge, receiving in its course the Morrel and the Rye-water, it quits the county at Leixlip. Numerous lesser streams, rising in the more elevated tracts, fall into one or other of these rivers. A great part of the Bog of Allen lies in the northern part of the county. This bog is not an interrupted morass, but is intersected in many places by elevated tracts of firm ground, the largest of which, lying in its southern part, has obtained the name of the Island of Allen, in consequence of its being surrounded by an unproductive and half fluid mass. To the S. of the town of Kildare is a tract of undulating ground, covered with fine sward, of a vivid green, uninterrupted by any plantation, and well known as the Curragh of Kildare. It extends nearly five miles in a south-eastern direction, having an average breadth of a mile, and containing 8000 acres. It is wholly the property of the crown, and has been long used principally as a sheep walk, for which it is peculiarly adapted, from the quality of its herbage and the dry elastic nature of its soil. The pasturage is held by the farmers of the surrounding lands, who pay large rents for the exclusive privilege of grazing sheep on it, in numbers proportioned to the quantity of land without it limits. The most celebrated race-course in Ireland is on the Curragh. The softness and elasticity of the turf render it peculiarly suitable for this sport. It is the chief race-course in Ireland, and perhaps the finest in the empire. Races are held here twice a-year, in April and September. During the late war with Russia the Curragh was occupied by a camp, and is now the quarters of a military division, consisting of a cavalry and two infantry brigades. The climate of Kildare is moister than most other parts of the great limestone plain of Ireland. The soil of the county is generally a rich heavy loam, on a bottom of limestone or limestone gravel, except in some insulated spots in the hilly districts. Copper ore is said to have been found in the central hills; but, either from deficiency of quality or quantity, or from a still more marked deficiency of fuel, none is now raised.

Kildare. The Hill of Allen, a steep conical elevation, rising to about 300 feet in height, and situated on the S.W. of the cultivated tract of land surrounded with bog and denominated the Island of Allen, consists of a fine-grained gritstone of which mill-stones are made.

The population was as follows, according to the authorities stated beneath, at the respective dates :—

1760.....	De Burgo.....	51,726
1772.....	Beaufort.....	56,000
1812.....	Parliamentary return	85,133
1821.....	Ditto.....	99,065
1831.....	Ditto.....	108,424
1841.....	Ditto	114,488
1851.....	Ditto.....	95,688

This population was represented in the Irish parliament by ten members—two for the county, and two for each of the boroughs of Athy, Kildare, Naas, and Harristown. All these boroughs were deprived of the right of returning members by the Act of Union; and as no change has since been made, the representation is at present confined to the two county members.

The number of children receiving instruction in public schools, according to returns made under parliamentary authority in 1824-26, was 8857.

Of this number 1425 were of the Established church, 7276 were Catholics, 31 Dissenters; the religious persuasion of the remaining 125 was unascertained. The number of schools was 214, of which 25, containing 1623 pupils, were maintained by grants of public money; 29, containing 1707 pupils, by voluntary contributions; the remaining 160 schools, containing 5527 pupils, were wholly supported by the fees paid by the parents or guardians of those receiving instruction.

In 1851 the number of schools in the county, and pupils attending them, was ascertained by the Census Commissioners to have been as follows :—

Schools.	No. of Schools.	No. of Pupils.		
		Males.	Females.	Total.
Maynooth College.....	1	505	...	505
National.....	50	1867	2130	3997
Church Education	12	184	143	327
Diocesan.....	1	6	1	7
Endowed	5	63	48	111
Private.....	44	626	332	958
Boarding.....	3	95	63	158
Parochial	12	208	148	356
Free.....	8	139	181	320
Military	1	12	8	20
Workhouse.....	3	498	505	1003
Gaol.....	1	77	26	103
Total.....	141	4280	3585	7865

Kildare.

The lands are very unequally portioned out. There are a few large estates. That of the Duke of Leinster extends over nearly one-third of the county. Many farmers hold large tracts; many others scarcely sufficient for the sustenance of a family, there being about 7000 holdings of less than 30 acres in extent. The general average of farms is about 17 acres. The larger farms are well cultivated according to the most approved systems, though not with all the neatness and precision which mark the operations of the English agriculturists. The small farmers manage their land in a slovenly manner, and with a persevering attachment to the customs of their forefathers. Wheat is grown in large quantities, the strong loam being well adapted for it. The lands not subjected to the plough are very rich, fattening grounds; but when exhausted by injudicious courses of cropping, the pasture is poor and light.

The crops grown on the land, and the extent of land under cultivation since 1847, is shown in the following table :—

Years.	Corn, Beans, and Pease.				Other Crops.				Flax.	Meadow and Clover.	Total extent under Crops.
	Wheat.	Oats.	Barley, Bere, Rye, Beans, and Pease.	Total.	Potatoes.	Turnips.	Green Crops.	Total.			
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1847	27,284	40,363	4,654	72,301	5,570	10,894	1,898	18,362	29	45,479	136,171
1848	28,124	40,512	5,109	73,745	14,230	8,852	905	24,017	17	46,446	144,225
1849	26,020	41,645	6,840	74,505	11,729	9,529	1,886	23,144	21	43,561	141,231
1850	22,737	45,791	8,196	76,724	12,158	9,622	2,534	24,314	23	46,446	147,507
1851	17,098	47,738	9,937	74,773	11,149	10,859	3,610	25,627	47	46,374	145,821
1852	13,339	49,511	9,420	72,270	10,749	10,387	3,111	24,247	17	45,146	141,680
1853	13,658	46,716	8,852	69,226	10,715	11,985	2,995	25,695	28	46,888	140,837
1854	18,381	43,520	7,767	69,648	13,109	9,988	2,053	25,150	6	45,123	139,947
1855	20,698	43,953	6,251	70,902	14,110	10,990	1,907	27,007	9	48,707	146,625

The number of live stock in the county appears from the following table :—

Horses, with the purposes for which they are kept—

1. Two years old and upwards—	1855.	1856.
Agricultural	8,570	9,110
Traffic and manufactures	366	1,006
Amusement or recreation.....	1,023	1,061
2. One year old, and under two years.....	1,801	2,260
3. Under one year.....	1,761	1,692
Total of horses.....	13,521	15,129

CATTLE—

1. Milch cows.....	15,190	16,042
2. Other cattle—		
Two years old and upwards.....	34,249	36,452
One year old, and under two years.....	13,710	13,719
Under one year	11,331	9,571
Total of cattle.....	74,480	75,784

SHEEP—

1. One year old, and upwards—	1855.	1856.
Ewes.....	57,787	50,924
Tups and wethers.....	37,917	40,467
2. Under one year	31,910	37,798
Total of sheep.....	127,614	129,189

PIGS—

1. One year old and upwards.....	3,639	3,055
2. Under one year.....	12,354	9,057
Total of pigs.....	15,993	12,112

The dwellings of the middling farmers generally consist of a long building of a single storey, the lower part formed of stone and mortar, the upper of clay thatched with straw, and divided in the inside into a kitchen and two sleeping rooms, one at each end. In the front is a yard or hawse enclosed at each side by the stables, barn, and cow-houses,

Kildare. and used as a repository for all the manure collected from the dwelling-house and offices, and from the feeding of the cattle. The habitations of the labourers or cottiers are very wretched, particularly those living in or near the edges of the bogs. The cabin is sunk beneath the surface of the soil, in order to diminish the quantity of wall to be built. The roof, thatched with sods of turf pared off the surface of the bog, is but a few feet above the ground, and assimilates so closely with the appearance of the surrounding fields as to be nearly imperceptible at a short distance, except from the smoke rising out of its openings, or the ingress and egress of children or domestic animals through the hole in the side intended for a door. The food of the peasantry is potatoes, with some milk and butter occasionally. The use of flesh meat is little known, except on a few high holidays. The fuel is universally turf, which may be said to be the only thing the poor man here has in plenty. The clothes of the peasantry are made of home-manufactured frieze, or cheap cottons.

Manufactures can scarcely be said to exist here. That of cotton was attempted, without success, at Prosperous, near Clane, where the first cotton-mill in Ireland was erected. An extensive woollen factory has been for several years at work near Celbridge, and still continues to produce large quantities of the coarser woollen cloths. Paper is also manufactured in some places, and tanning is carried on to a considerable extent. The county affords many fine sites for water-mills. The beautiful falls of the Liffey, at the Salmon-leap, near Leixlip, offer a perennial command of water adequate to move very extensive machinery. Many other falls are to be met with on the same river in its course through the county. The locks of the canals also could supply water for many lesser works. The Grand Canal enters the county from the Dublin side, at Hazelhatch, 8 miles from the harbour at Portobello, and passes through it in a south-western direction to Sallins, where there is a short branch to the town of Naas. The main trunk proceeds in a western direction to Lowtown, at which place it divides into two branches; the one, proceeding westward to the Shannon, near Banagher, quits the county at Edenderry; the other, which takes a more southern direction, joins the Barrow at Monasterevan, the western bank of which river it follows as far as Athy, where it ceases, the river navigation from that point to the sea being deemed sufficient for the purposes of inland navigation. The summit-level, commencing at the distance of 7 miles from Dublin, and extending 4 miles, is 264 feet above the level of the sea at high water. The Royal Canal, which skirts the northern boundary of Kildare, enters the county at Leixlip, and proceeding by Maynooth, Kilcock, and Cloncurry, quits it for the county of Meath at the Boyne. Both these carry to Dublin large quantities of turf, bricks, stone, flags, slate, grain of every description, and potatoes.

The remains of antiquity in the county are numerous. There are five round or pillar towers. That at Kildare is said to be the most perfect in Ireland; it is 130 feet high. At Taghadoo there is another 71 feet high. The third, at Kilcullen, has only 40 feet standing. The fourth, at Oughterard, has suffered still more severely from the ravages of time; its height is but 25 feet. The fifth, which stands in the churchyard at Castledermot, is used as a belfry, and by a casual spectator might be mistaken for the trunk of a lofty tree, in consequence of its being enveloped with a covering of ivy from its base to its summit. Several of the upright stones, supposed to be relics of the worship of Baal, are also to be seen. One at Punch's Town stands 20 feet above the ground; another, with a conical top, is at Harristown; two others, situated at Jigginstown, are known by the name of the Long Stones; another, called the Gobhlan, is near the Hill of Carmen or Mullamast, where is also to be seen a large rath, situate on the summit of a hill of some

elevation, near which are sixteen smaller raths or hillocks. **Kildare.** These are said to have been the seats of the elders when the assembly of the states of Southern Leinster, under the name of Naasteighan, was held on this eminence. At a later period it became more memorable from a tragedy acted upon it by some of the English settlers, who, having invited the neighbouring Irish chieftains to a conference there, for the amicable settlement of their disputes as to territorial boundaries, fell upon them unexpectedly, and slaughtered them to a man. The pit into which the heads of the victims of this murderous act of treachery were flung is still shown; and the place thence acquired its name of Mullamast, or the Hill of Decapitation. The other raths of most note are those of Ard-cull, near Naas, where the English, under Hammoh le Gros, were totally defeated by the Scots, under Edward Bruce, in 1315; and that of Rheban, to the N. of the same town. Others are still to be seen at Naas, Kilkea, Moone, Clane, and Lyons, and at Rath-sallagh. The Abbey of Kildare is one of the oldest in Ireland. It is said to have been founded by St Brigit, and was the place where the sacred fire was kept, which, after being extinguished by Henry de Loundres, Archbishop of Dublin, in 1220, was again lighted and kept burning till the Reformation. The ruins of the building in which it was kept still exist. Castle Dermot had also three great monasteries. A parliament was held in one of them in the year 1499. Naas had an Augustinian and a Dominican abbey. The site of the fine abbey of Monasterevan is occupied by Moore Abbey, the residence of the Marquis of Drogheda. Of that of St Woolstan's, near Celbridge, nothing now remains but two towers and gateways. At old Kilcullen, the site of the monastery is marked by some curious stone crosses. The principal castles are those of Kilkea, built by the seventh Earl of Kildare, lately restored, and now the residence of the Marquis of Kildare; those of Athy and Castle Dermot were built by the eighth Earl of Kildare. Timolin Castle was erected in the reign of King John, by the Lord of Norragh. Rheban, on the Barrow, gave the title of baron to the family of St Michael. The castles of Narraghmore and Harristown also gave baronial titles to their possessors. Amongst the modern seats the most remarkable are—Carton, near the town of Maynooth the princely residence of the Duke of Leinster; Castletown, one of the largest and finest Italian mansions in Ireland, the seat of the Conolly family; Killadoon, that of Lord Leitrim, in the same neighbourhood; Lyons, on the banks of the canal, the splendid mansion and demesne of Lord Cloncurry; Straffan, on the Liffey, between Celbridge and Clane, the residence of Mr Barton; Belan, near Timolin, once the seat of the Earls of Aldborough; and Palmerston, the Earl of Mayo's. At Jigginstown, near Naas, are still to be seen the walls of a large mansion commenced by the unfortunate Earl of Strafford, whilst lord-lieutenant under Charles I., but never finished.

There is no large town in the county. The population of neither of the assize towns amounts to 5000 souls. That of Athy, the larger, was, in 1851, 3908; and of Naas, 3132 souls. The former of these towns is situate on the banks of the Barrow, which is here crossed by a bridge, and owes much of its small population to its being the point of connection between the still-water navigation of the Grand Canal, which terminates here, and the river navigation of the Barrow to Ross and Waterford. It was incorporated by James I., under the care of a sovereign, two bailiffs, and twelve burgesses. The assizes are held here once a-year; and its old castle has been converted into a prison. Naas, pleasantly situated on the Liffey, in the centre of a very fertile and well-cultivated tract of country, and communicating with the main trunk of the Grand Canal by a connecting branch, carries on a considerable retail trade. Maynooth is remarkable for several castellated ruins, built at

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various times by members of the Fitzgerald family; and for being the site of the Roman Catholic college, founded for the education of the priesthood, and supported by an annual parliamentary grant. (H. S.—E.)

KILIMANDJARO, the highest mountain in Africa (with the doubtful exception of Kenia), is in the Djagga country, W.N.W. from Mombaz, S. Lat. 3. 40., E. Long. 36., about 250 miles from the coast. It is crowned with perpetual snow: estimated height, 20,000 feet. It was discovered in April 1848 by Dr Krapf, a missionary.

KILKENNY, an inland county, in the province of Leinster, in Ireland, is bounded on the N. by the Queen's county, on the E. by the counties of Carlow and Wexford, on the S. by the county of Waterford, and on the W. by that of Tipperary. According to the Ordnance Survey, the total area of the county is 509,732 acres; of which 470,102 are arable, 21,126 uncultivated land, 13,899 in plantations, 1549 occupied by towns and villages, and 3056 are under water. Of the 21,000 acres of coarse pasture or uncultivated land, it is calculated that about 7500 acres may be improved for cultivation, 6000 for pasture by draining, and 7500 acres may be considered as unimprovable.

According to Ptolemy, the county was inhabited by the Brigantes and the Caucoi. It afterwards formed part of the kingdom of Ossory, which was sometimes tributary to Leinster, sometimes to Munster. After the arrival of the English, it formed one of the counties into which King John divided that portion of the island which recognised his supremacy. At the termination of the sixteenth century it was chiefly occupied by the Graces, the O'Brenans, the Butlers, the O'Sheas, the Rooths, the Harpurs, the Walshes of the mountains, the Shortals, and the Forstals. It is now divided into the ten baronies of Callan, Crannagh, Fassadinin, Galmoy, Gowran, Ida, Iverk, Kells, Knocktopher, and Shillelogher; besides which, the county of the city of Kilkenny forms a separate jurisdiction. These baronies are subdivided into 140 parishes.

The parish of Durrow, forming an insulated portion surrounded by the Queen's county, was made part of the county of Kilkenny by an act of parliament, obtained through the influence of the Duke of Ormond. His object was to repress the outrages committed on his tenantry by the Fitzpatrick's, who inhabited that district, and who, when tried in the Queen's county, which belonged to their own sept, were always acquitted, but when tried in Kilkenny, the Duke's county, were sure to be convicted.

According to the ecclesiastical arrangements of the country, Kilkenny is chiefly comprehended within the diocese of Ossory, which extends over 120 of its parishes; the remainder are in the diocese of Leighlin. The see of Ossory was first planted at Seikyrán, near Birr, about the year 402; thence it was removed to Aghaboe, in the Queen's county, about 1052; and finally to Kilkenny, in the latter end of the reign of Henry II. Like Meath, it derives its name, not from the seat of the episcopal see, but from that of the district over which it extends. Besides nearly the whole part of the county of Kilkenny, the diocese also comprehends the entire barony of Upper Ossory, forming one-third of the Queen's county, and a small part of the King's county. The dean of the cathedral exercises a kind of episcopal jurisdiction over the vicars-choral, similar to that of the dean of St Patrick's, Dublin; and the archdeacon formerly exercised an ordinary prescriptive jurisdiction over the whole diocese. The annual value of the see was estimated at L.3859 by the parliamentary return made in 1833. In conformity with the provisions of the Church Temporalities Act, this diocese has been united to the dioceses of Leighlin and Ferns.

The surface of the county is mostly level in the central baronies, but hilly in the northern, and still more so in the south-eastern districts. Very little ground is unfit for tillage,

and that which is not productive of good grain throws up excellent herbage. The soil in the northern parts is chiefly a mossy turf a few inches deep, lying over a bed of stiff yellow or whitish clay. More southerly, the soil is light, covering an argillaceous schistus. To the W. there is a hungry clayey loam, over a bed of limestone. In general, the nearer the limestone is to the surface, the poorer the soil. A light soil covers all the vicinity of the city of Kilkenny, exhibiting the appearance of slaty hills and gravelly bottoms. Proceeding southwards, the fertility increases. The angle of the River Suir, which forms the parish of Portnascully, is the richest land in the county. The quantity of bog is inconsiderable, amounting altogether to 3500 acres; the largest tract is in the north-western extremity. Marl has been found between two strata of black turf mould; three strata of bog have also been discovered, separated by intervening beds of marl, oak, and fir; willow and birch have been found in the bogs. There are no loughs of any extent. In the parish of Cloghmanta there are some temporary lakes, produced by the water bursting up from the ground in November, and subsiding in spring. They are here named Loughans; in Connaught they are called Turloughs. The climate is less humid than that of Dublin or Wicklow.

The principal rivers are the Nore, the Barrow, and the Suir; all of which rise in the range of the Slieve Bloom Mountains, and, taking a southern direction, discharge themselves by a common mouth into the estuary at Waterford. The Nore rises at the eastern base of the Devil's Bit Mountains, in the county of Tipperary, passes through the middle of this county, and by the city of Kilkenny. It is navigable for boats as far as Thomastown, and unites with the Barrow about 2 miles above Ross, in the county of Wexford. The salmon-peal, a fish resembling the salmon, is caught in this river. The King's River joins the Nore at Jerpoint, and the Argula, near Innistioge. The Barrow forms the eastern boundary of the country from near New Bridge to its junction with the Suir, which latter river is its boundary to the S. The Barrow is navigable for boats along the whole extent of the borders of the county of Kilkenny; and still farther, to Athy, in Kildare county. The Suir is navigable for sloops to Carrick, and for barges to Clonmel, in Tipperary.

The substrata of this county are granite, clay-slate, limestone, and sandstone. The granite hills form a very small part, being merely the extension of the Wicklow group. The rock is of various shades, but the best is of a light yellow tint, finely grained, and compact; black mica is found in it, together with specks of iron ore. In the western part of the county there is an extensive slate quarry, highly esteemed.

The collieries of Castlecomer, the most extensively worked of any in Ireland, are situated near the confluence of the small rivers Dinan, Dian, Bruckagh, and Cloghoge, which join the Nore. They were discovered by accident, in working for iron ore. The depth of the beds varies from 2 feet 6 inches to 3 feet 1 inch. The workings extend over a tract of about 8 miles in length, and all the coal of the district is of that variety termed anthracite. It burns without flame or smoke, but, on account of its sulphureous exhalation, is unfit for domestic use. The excellent qualities of the Kilkenny coal for particular purposes occasion a great demand for it. It is heavy, burning with little flame, like charcoal in an ignited state, and throwing out a steady and violent heat. It dries malt well, and is excellent for the forge. The coal sill, or seat of the coal, which is sometimes raised with it, is a soft, black, brittle shale, full of shining impressions, exhibiting obscure traces of the stems of gramineæ. It enters into the composition of excellent crucibles, which resist the strongest heat, as the more they are exposed to the fire, the harder they become. Fire-bricks are made from two parts of it and one part of clay. When analyzed, 100 grains appeared to contain 61 per cent. of silice, 36

Kilkenny. of argil, the remaining 3 grains were carbon and calcareous earth, with an almost imperceptible quantity of iron, being nearly identical in composition with pure Stourbridge clay when dried. It seems peculiarly calculated for cementing steel, and for potteries; but it has not been applied to either purpose, although materials for earthenware are to be found in the neighbourhood, and iron-mines of the best quality occur in upper strata of entire hills. Yellow ochre is found in various places; also pipe-clay of good quality. Manganese is seen on the banks of the Barrow, and near Freshford, and lead in small quantities between Innistioige and Ross; a mine of the latter at Floodhall was worked for some time with considerable profit. Iron has also been raised. Jasper has been found near the extremity of the granite district, between the Nore and Barrow. Limestone is the base of the central part of the county; but the quality varies much in different places, all the varieties of it containing impressions of shells or corallines. The most important limestone quarry is that which produces the Kilkenny marble; it lies about half a mile from the city. The marble, when polished, presents a black ground, curiously varied with madrepora, bivalve, and other organic impressions, which appear more strongly when exposed to the air; but that approaching nearest to unmixed black is most esteemed. The blocks when raised, are finished at a marble-mill at some distance, remarkable for the ingenuity and simplicity of its mechanism. The marble is used for chimney-pieces all over the county, and in some other parts of Ireland.

At Ballyspellan, in Galmoy barony, is a very celebrated mineral spring. It is a chalybeate, and contains carbonic acid gas, which soon evaporates on exposure to the air. Its medicinal qualities have long been highly esteemed in the neighbouring country. Chalybeate springs, but not of much strength, exist in other places. This county also abounds with springs of very pure transparent water, most of them dedicated to some saint, whose patron-day is annually celebrated on their verge.

The census of population, taken at different periods, presents the following results:—

1760	De Burgo,	62,832	1831	Census,	169,945
1792	Beaufort,	100,000	1841	Ditto,	183,349
1812	Census,	134,664	1851	Ditto,	138,779
1821	Ditto,	158,716			

Exclusive of 20,000 inhabitants in the city of Kilkenny.

The parliamentary returns of the number of children receiving education in the public schools, in the years 1821, and 1824–26, give the following results:—

	Boys.	Girls.	Sex not ascertained.	Total.
1821	10,191	4420	...	14,511
1824–26	12,398	7000	274	19,672

Out of the total number of children, according to the latter of these returns, upwards of 18,000 were Catholics; the Protestants amounting only to 1376, of which number

but 13 were dissenters. The number of schools maintained by public money was 19, in which 1515 pupils were instructed; of those maintained by private subscriptions, the number was the same, the pupils in them being 1281: all the other schools, 346 in number, in which 16,876 children were instructed, were maintained wholly by the fees of the pupils. The number of schools, and of pupils attending them, in 1851 was ascertained to be—

Schools.	No. of Schools.	No. of Children.		
		Males.	Females.	Total.
CITY OF KILKENNY—				
National	3	231	54	285
Boarding	4	135	17	152
Private	12	250	155	405
Free.....	1	...	216	216
Regimental.....	1	129	3	132
Workhouse	2	526	203	729
Gaol.....	2	101	12	113
Total	25	1372	660	2032
COUNTY OF KILKENNY—				
National	91	3347	2621	5968
Church Education	11	130	148	278
Boarding.....	2	26	23	49
Private	68	1016	669	1685
Parochial.....	15	284	159	443
Free.....	7	108	120	228
Boarding, Charitable...	1	31	...	31
Workhouse	4	336	398	734
Total.....	199	5278	4138	9416

The county returned 16 members to the Irish parliament—2 for the county at large, 2 for the city of Kilkenny, 2 for the adjoining borough of Irishtown, and 2 each for the boroughs of Callan, Gowran, Innistioige, Knocktopher, and Thomastown. All these, except Kilkenny, were close boroughs, the elective franchise being vested in the burghesses, whose number seldom exceeded 20, and who were elected through the influence of the proprietor of the land.

Very little land in the county is unfit for tillage; the central parts are peculiarly adapted for wheat, to the growth of which the best ground, most of which has a limestone substratum, is devoted. The more mountainous tracts are exclusively appropriated to oats or pasture. Wheat is sown either on a fallow or after potatoes. Wheat here suffers from what is called the red or yellow worm; but as often this disease appears only in dry seasons, when the crop is better and more abundant, the evil is not extensive. Barley is usually sown after wheat. The extent of land under each description of crop, and the total extent in cultivation since 1847, is stated in the agricultural returns collected by the Irish government to have been as follows:—

Years.	No. of Holdings above 1 acre.	Corn, Beans, and Pease.				Other Crops.				Flax.	Meadow and Clover.	Total extent under crops.
		Wheat.	Oats.	Barley, Bere, Rye, Beans, and Pease.	Total.	Potatoes.	Turnips.	Green Crops.	Total.			
		Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1847	18,147	50,112	52,088	13,058	115,258	9,403	10,083	2588	22,074	90	43,082	180,504
1848	17,386	49,411	46,425	14,035	109,871	27,002	6,335	1453	34,790	47	42,893	187,601
1849	17,035	50,466	45,811	12,359	108,636	25,702	9,175	2686	37,563	16	39,613	185,828
1850	16,700	47,343	52,236	12,641	112,220	26,321	11,613	3255	41,189	32	42,482	195,923
1851	15,123	37,036	57,781	13,178	107,995	26,998	11,413	3790	41,601	226	45,020	194,842
1852	14,510	33,198	62,588	10,774	106,560	25,972	9,934	4073	39,979	95	45,462	192,096
1853	14,063	25,005	63,996	11,623	100,624	22,055	13,126	3560	38,741	78	44,485	183,928
1854	13,955	34,968	54,205	8,582	97,755	25,667	11,270	3027	40,864	54	44,241	181,914
1855	...	37,297	53,102	8,659	99,058	22,812	12,689	3196	48,697	45	47,437	185,237

Kilkenny.

The use of green food for cattle is not so general as might be desired. Many of the cattle graze out during the winter; some are housed from Christmas to April. The only green food used in winter is furze-tops pounded, on which the cattle soon become sleek and fine skinned; for this purpose the large French furze is preferred. Little attention is paid to improve the pasturages. The mountain pastures are left in a state of nature, and the land produces little but heath. Much land on the borders of the Nore and Suir is embanked and used for meadowing. The most considerable dairies are in the Walsh Mountains; a name supposed to

be derived from the family to which a large tract of land Kilkenny. formerly belonged.

Few horses are bred in the county, most are brought in from Munster to the fair of Callan, the most esteemed fair for this description of stock. The common stock of black cattle is a cross of the Irish breed on the long-horned English. The Kerry cow is much in demand in dairies, for its low price and quantity of milk. The breed of sheep has improved very much. The number of holdings above one acre, and the quantity of live stock in the county since 1847, is shown in the following table:—

Year.	No. of Holdings above 1 acre.	Horses.			Mules.	Asses.	Cattle.			Sheep.		Pigs.		Goats.	Poultry.
		2 Years old, and upwards.	1 Year old, and under 2.	Under 1 Year.			2 Years old and upwards.	1 Year old, and under 2.	Under 1 Year.	1 Year old and upwards.	Under 1 Year.	1 Year old, and upwards.	Under 1 Year.		
1847	18,147	17,318		1489		3276	54,263		16,276	34,748	15,072	20,129	18,055	4920	196,695
1848	17,386	16,068	1150	1077	693	2237	46,675	13,298	13,137	29,823	10,584	12,278	19,257	5200	202,387
1849	17,035	15,424	892	1116	671	3271	43,278	12,906	12,303	25,045	9,825	15,469	24,416	5164	186,193
1850	16,700	14,957	1089	1115	687	3355	45,314	13,746	13,938	26,512	12,955	14,794	30,969	5958	197,955
1851	15,123	14,075	998	1169	733	3913	44,207	13,765	14,398	31,070	14,600	17,895	35,066	7372	212,892
1852	14,510	13,677	965	1229	702	4036	46,082	15,038	17,158	42,175	19,747	17,483	30,594	8876	241,176
1853	14,053	13,628	1181	1637	636	4198	50,336	17,188	21,464	52,038	30,752	14,951	35,932	9439	251,343
1854	13,955	13,576	1490	2097	619	4354	55,963	16,349	20,428	62,360	36,814	14,099	46,696	9807	252,268

Bees were more attended to formerly than now, yet the soil and climate are well suited to them. The dry hills, covered with heath and scented herbs, produce honey celebrated for its flavour, and for the depth of its combs.

Within the last century, many parts of the county were covered with woods. Now there are but few, not covering more than 2000 acres. Attempts to raise plantations from the seed have not been successful; the seeds in this mild climate being liable to destruction from vermin. Orchards are much neglected. There are some ozieries on the banks of the Nore and Suir.

The woollen manufacture was introduced by the Earl of Ormond in the early part of the fourteenth century. He brought over workmen from Flanders, whose manufacture is still to be seen in the castle of Kilkenny. James Duke of Ormond went to great expense to introduce the linen manufacture in the seventeenth century. Latterly an attempt was made to manufacture superfine broad cloths in the neighbourhood of Kilkenny, but it soon failed. Friezes and ratteens are still made; the women spin the wool. The manufacture of woollen cloth was succeeded by that of blankets, which is still carried on. The linen trade, after a continuance of 50 or 60 years, has so died away that not a vestige of it now remains, beyond the making of coarse linen and sacking for domestic use. Paper is manufactured in several places. The principal part of the grain raised in the county is sent to Dublin in the form of flour, malt, and meal, the manufacturing of which is another source of wealth.

The number of resident gentry is considerable. Amongst the mansions remarkable for splendour or for architectural beauty are—the castle of Kilkenny; Mount Juliet, the seat of the Earl of Carrick; Desart, an Italian structure, the seat of the Earl of Desart; Kilfane, that of Sir John Power, Bart.; Flood Hall, the residence of the head of the Flood family; Besborough, the seat of the Earl of Besborough; and Woodstock, the seat of the Right Hon. Wm. Frederick Tighe, which has the reputation of being one of the most beautiful domains in the south of Ireland. The mansion is large, and the woods very extensive, stretching for 2 miles along the right bank of the River Nore, and reaching to the summit of the bank, a height of 800 feet. The farm-houses are of stone, more generally cemented with clay than with mortar, the offices usually forming an irregular yard in front of the house. The people in the hilly parts, who

hold land at will, live in scattered villages. The usual food of the peasantry is potatoes, to which milk and salt are generally added, and occasionally a herring. Turf is the general fuel, except in the neighbourhood of the collieries, where coal is burned, or else culm made up in balls with one third of clay. The clothing of the peasantry is frieze, ratteen, and flannel.

Amongst the remains of antiquity may be noticed a circle formed of stones on the summit of Slieve Grian, "The Hill of the Sun," called also Tory Hill, on one of which is an inscription that has given rise to much controversy. There is another circular group of stones on the Hill of Cloghmanta, which signifies "The Rock of God." The most remarkable cromlech is at Kilmogue; its upper stone is 45 feet in circumference. The country people call it Lachan Schal, or "The Great Altar Stone." Near the Spa of Ballyspellon is a large stone, formerly supported by others; it is called Clogh-bannagh, or "The Stone of Blessing." Rathes are numerous, particularly in Galmoy and near the Nore. At Earlsrath are the remains of a very large fort enclosed by a fosse. A moat near Rathbeath is pointed out as the place where Heremon, son of Milesius, built his palace and was buried. There are five pillar towers in the county. One is in Kilkenny, close to, and almost forms part of the cathedral; it is 100 feet high, and 48 feet in circumference at the base: the others are at Tulloherin, Killee, Fertagh, and Aghaviller, of which last the lower part only remains. All are in the vicinity of places of worship. Besides the remains of monasteries in the city of Kilkenny, there are vestiges of some others, once of great note, particularly one at Jerpoint, about one mile from Thomastown, and one of the most interesting ecclesiastical ruins in Ireland, founded by Donough, King of Ossory, and affords a fine example of the mixed Anglo-Norman and English styles of architecture. Another at Graig was founded under the auspices of the Earl of Pembroke in 1212, for Cistercian monks, and is still a venerable and interesting ruin. The Dominicans had abbeys at Rosbercon, founded in 1267, and at Thomastown, five beautiful pointed arches of which still remain. The Carmelites had one at Knocktopher, and there was a nunnery at Kilculliheen.

The number of castles is very great; most of them consist of a single square tower, which formed the keep. Graney or Grandison Castle, in Iverk, is among the most celebrated, as having been the residence of Margaret Fitzgerald,

Kilkenny. the great Countess of Ormond; it is supposed to have been built by the eighth Earl of Ormond, Lord-Deputy of Ireland, in 1521, and was taken by the parliamentary forces, under Colonel Axtel. From the towers and walls which remain some idea can be formed of the importance of the place when entire and garrisoned as a fortress. King John built a castle at Tybrachny, where there are the remains of a Danish town.

KILKENNY CITY is situate on the River Nore, which divides it into two unequal portions, and nearly in the centre of the county. Its name is generally derived from Kilkenny, "The Church or Cell of St Canice;" though by some it is traced from the words Coil-ken-ui, "The Wooded Hill near the River." It formerly consisted of two separate jurisdictions,—the city of Kilkenny properly so called, and the borough of Irishtown, separated from each other by the small stream called the Breagh, a tributary of the Nore; but by the provisions of the Municipal Reform Act the two corporations were amalgamated. An English settlement was formed here shortly after the landing of Strongbow; a castle was also erected, and the seat of the see of Ossory removed thither. William, Lord Marshal, who married Strongbow's daughter, granted the town a charter of incorporation, which was confirmed by Gilbert, Earl of Clare. Elizabeth and James I. confirmed and enlarged its privileges. From the Anglo-Norman invasion in 1170, to the Parliamentary War in 1641, Kilkenny was one of the most important inland towns in Ireland. It was frequently the residence of the Lord-Lieutenant, and parliaments were sometimes held in it; amongst others, that which passed the celebrated statute of Kilkenny, which first notices the distinction of English by blood, and English by birth. During the wars of 1641, it was the place where the assembly of the confederate Catholics held their sittings; the room where they met is still shown. Cromwell afterwards took the city on terms highly honourable to its defenders, and subsequently held his high court of justice in it. The city is irregular, but presents a cheerful and busy aspect; the houses, built chiefly of stone, are large and respectable. "I found the city of Kilkenny," says Inglis, "a large, well-built, beautifully situated, and very interesting town. In fact, I scarcely know any town more interesting or more picturesque." The Nore, here a river of some breadth, though not navigable, is crossed by two modern bridges. On the two most elevated points of the united towns are the castle and the cathedral, the most marked and ornamental structures of both. The baronial castle, which is full of historic associations, comprehends the remains of the ancient fortress, combined with more modern buildings. It was built by Strongbow in the twelfth century, purchased by James, third Earl of Ormond, in 1391; it has ever since been the principal residence of the head of the Butler family. In 1399 he entertained Richard II. in it for fourteen days. King William dined here after the battle of the Boyne. The buildings now form the sides of a quadrangle, the large interior courtyard having been retained. Its principal apartments were the presence chamber, formed of a suite of rooms opening into one another, in the farthest of which was an elevated seat for the lord of the mansion; and the picture gallery, 150 feet in length, chiefly furnished with family portraits. Several of the rooms are hung with tapestry. The court-house is a large and elegant modern building, erected on the site of Grace's old castle, where the assizes used to be held. The *tholsel*, or city court, is also large, but unornamented; it contains several apartments, one of which is used as a library. The market, well stocked with provisions of every kind, is held in one of the divisions of its inferior area. There are barracks both for cavalry and infantry. The county jail is at a short distance from the city. The environs of the town are very beautiful. The Duke's Walk, or Mall, extends

upwards of a mile along the banks of the Nore. The corporation consists of a mayor and aldermen, and other subordinate officers, who have the management of an income, arising from rents, of about L.2000 per annum. The cathedral of St Canice is an extensive pile, on a commanding elevation, in Irishtown. It is cruciform, surmounted by a small tower, and of greater dimensions than any similar building in Ireland, except the cathedral of St Patrick in Dublin. In the north transept is a chapel used as the parish church, where also is a stone seat called the Chair of St Kevin. The choir and chancel are fitted up in a style of chaste simplicity. The aisle contains several sepulchral monuments; amongst them that of Pierce, eighth Earl of Ormond, and Margaret Fitzgerald, his wife. The burial-ground of the cathedral is entered by a flight of marble steps, and is planted with trees. The episcopal palace was originally erected in the time of Edward III., and was modernized and enlarged in 1735; it is now a commodious, though not a splendid residence. The church of St Mary is a spacious but plain structure. Several monastic institutions added much to the beauty and dignity of the city. The most ancient was the preceptory of St John, founded about 1211. The abbey church, remarkable for the singular structure of its windows, which procured it the name of "The Lanthorn of Kilkenny," has been converted into a parochial church under its old name. The extensive and noble ruins of the Dominican or Black Abbey, founded in 1225, have been repaired, and now form a Roman Catholic place of worship. The ruins of the Franciscan Abbey, situate on the banks of the Nore, are much admired. The grammar school, generally called the College, was founded by Pierce, Earl of Ormond, and re-endowed by the Duke of Ormond in 1684. James II. erected it into a royal college, but on his abdication it reverted to its former state, and is now a respectable place of elementary instruction, capable of accommodating eighty resident pupils. In it Dean Swift, Congreve, Farquhar, and Bishop Berkeley, acquired the rudiments of classical literature. Kilkenny has also a seminary for the education of students intended for the Roman Catholic priesthood. The city also contains several Roman Catholic chapels, the county gaol and infirmary, union workhouse, and district lunatic asylum. A neat range of buildings, called St James' Asylum, in the suburbs, was endowed in 1803 by Mr James Switzer, for the maintenance of twelve Protestant and eight Catholic widows. The population of the county and city of Kilkenny in 1851 was 19,973; of the city alone, 15,808. No other place in the county, except Callan (2368), contains more than 2000 inhabitants. (H. S.—R.)

KILLALA, a small seaport of Ireland, county Mayo, on a bay of the same name, 26 miles N.E. of Castlebar. Pop. 1446. It was formerly the seat of a bishopric, founded by St Patrick, united in 1607 to Achonry, and to Tuam in 1833. The cathedral, a small but venerable building, is now used as the parish church; near it is a remarkable round tower. A French force under General Humbert landed here in 1798, and held the town for a short time.

KILLALOE, a market-town and bishop's see of Ireland, county Clare, 12 miles N.E. of Limerick. It is finely situated, though poorly built, on the Shannon, which is crossed by an old bridge of 19 arches, connecting the town with the suburb of Ballina on the Tipperary side. The river is navigable by large steamers from Killaloe to Leitrim (129 miles), and there are docks and quays here a little above the bridge. Pop., including Ballina, 2230, chiefly employed in marble mills, slate quarries, and in works connected with the river navigation. The principal building in the town is the cathedral, an old cruciform edifice with a tower; near it is the stone-roofed cell of St Lua, first Bishop of Killaloe; and on a small island opposite the episcopal demesne, is another chapel still more ancient. This town was long the

Killala
Killaloe.

Killarney
||
Kilrush.

royal seat of the O'Briens; and at Kincora, on Lough Dearg, about a mile to the N., are pointed out some remains of the residence of Brian Boru. At Killaloe, in 1691, General Sarsfield intercepted the artillery of William III. on its way to Limerick. The diocese, which dates from the seventh century, includes 70 benefices. The episcopal income is L.3870.

KILLARNEY, a market-town of Ireland, county Kerry, is beautifully situate, about a mile from the water, on the eastern shore of the lower lake of Killarney, 44½ miles W.N.W. of Cork. It is for the most part well built of stone, with clean regular streets; and during the summer and autumn is greatly resorted to by tourists. Pop. 5964.

KILLARNEY, Lakes of. See **KERRY**.

KILMALLOCK, a town of Ireland, county of Limerick, on the Dublin and Cork Railway, 17 miles S. of Limerick. It is supposed to derive its name from St Molach, who founded an abbey here in the beginning of the seventh century. It became the chief town of the Desmonds, and rose to great importance and splendour. Previously to the Union it returned two members to the Irish parliament. The present town is little more than an assemblage of ruins, and has obtained the title of the Irish Baalbec. The ancient houses, occupied at one time by the great families of Limerick, are now the abodes of filth and wretchedness. Externally they are frequently little altered, and are generally ornamented with battlements, stone mouldings, and arched doorways. The Abbey church dedicated to St Peter and St Paul, consists of choir, nave, transept, and belfry. The choir is now used for Divine service. Of the Dominican friary, founded in 1291, only the roofless church and part of the cloisters remain. Two gates and part of the ancient walls still remain. Pop. 1074.

KILMARNOCK, a flourishing market-town and parliamentary and municipal burgh of Scotland, Ayrshire, at the confluence of the Kilmarnock Water and Irvine (over which there are here seven bridges), 19 miles S.W. of Glasgow by rail. Its general appearance is highly respectable. The principal streets are well built and spacious, containing several handsome public buildings. In the centre of the town is a cross, and a statue of Sir James Shaw. Among the public institutions are an excellent academy (with 360 pupils in 1851), a library, three literary institutes (497 members in 1851), with libraries and two reading-rooms. Kilmarnock was long the principal seat of the blue bonnet and striped night-cap manufacture. This is now quite surpassed in importance by the manufacture of carpets and worsted shawls. Boots and shoes, hosiery, machinery, &c., are also made to a considerable extent; and there are some large tanneries. The town is situate in the midst of a highly cultivated district, abounding in coal and freestone. A railway (the first public line opened in Scotland), connects it with the seaport of Troon, 9½ miles distant. The burgh is governed by a provost, 4 bailies, a treasurer, and 12 councillors, and returns one member to parliament in conjunction with Port-Glasgow, Dumbarton, Renfrew, and Rutherglen: constituency in 1856, 600, being about the half of the combined numbers. It has two newspapers and several printing presses. Here, in 1786, was printed the first edition of the poems of Burns. In the neighbourhood are the ruins of the castles of Dean and Craufurdland.

KILOGRAMME, KILOLITRE, and KILOMETRE. See **FRANCE**, § *Weights and Measures*.

KILRENNY, a municipal and parliamentary borough and seaport of Scotland, county of Fife, on the N.E. shore of the Frith of Forth, 9 miles S. by W. of St Andrews. It forms a contributory borough to St Andrews, but is otherwise a place of little importance. Pop. of borough (1851), 1862, chiefly engaged in fishing.

KILRUSH, a market-town and seaport of Ireland,

county Clare, pleasantly situate at the head of a small bay on the N. side of the Shannon estuary, 36 miles W. of Limerick. It is neatly built, with several good public buildings; has some linen and woollen manufactures; and exports considerable quantities of herring and other fish to Limerick. Peats from the neighbouring bogs are also exported in large quantities. The harbour, which is the first above the mouth of the Shannon, is well sheltered except from the S. wind. There is a good pier, and steamers ply regularly to Limerick. Pop. 4471. In the Island of Scattery, which protects the roadstead of Kilrush, are numerous ecclesiastical antiquities, among which is a round tower 120 feet high.

KILSYTH, a parish and burgh of barony in the county of Stirling, Scotland, interesting as the centre of a remarkable religious revival in 1742-3, and on a smaller scale in 1839. The town, 12 miles N.E. of Glasgow, is ill built, and not remarkably clean. Pop. 3949, chiefly employed in hand-loom weaving.

KILWINNING, a town and parish of Scotland, Ayrshire, on the Garnock, 26 miles S.W. of Glasgow by rail. The chief interest of the place is connected with its ruined abbey, originally one of the richest in Scotland. It was founded in 1107 by Hugh de Morville, Lord of Cunningham, and dedicated to St Winning, who lived on this spot in the eighth century, whence the name. The monks were of the Tyronensian order. The first Scottish mason-lodge was founded here by a band of foreign brethren who came to assist in the building of the abbey. Here also the practice of archery has been kept up since the close of the fifteenth century. Pop. 3265; the men principally employed in hand-loom weaving and in the neighbouring coal and iron mines; many of the women in needlework. There is railway communication with the port of Ardrossan, 5½ miles. Not far from the town is the magnificent residence of the Earl of Eglinton.

KIMBOLTON, a small town of Huntingdonshire, 11 miles W.S.W. of Huntingdon, with an ancient castle, the seat of the Dukes of Manchester, and residence of Catherine of Aragon after her divorce from Henry VIII.

KIMCHI, DAVID, an illustrious Jewish rabbi, was born at Narbonne about the end of the twelfth century, and died in Provence in 1240. His father, Joseph Kimchi, and his brother, Moses Kimchi, though decidedly inferior to him, were men of great note in their day as Hebrew scholars and commentators. Moses Kimchi is the author of the celebrated *Commentary on the Life of Ezra*, incorporated in the rabbinical bible of Venice, 1549; and of a *Hebrew Grammar* published in that city in 1624. David Kimchi, however, has always been regarded by the Jews with a much higher feeling of reverence than any other member of his gifted house. Their respect for him falls little short of superstition; and in matters of doubt or dispute his authority is looked upon by them as final. In the fierce controversy which broke out between the Jews of Spain and those of France as to the opinions of Maimonides, he was chosen to arbitrate between the disputants: and it was entirely through his wisdom and knowledge that the controversy was brought to a close in such a way that both parties were completely satisfied. His printed works, as highly esteemed now as when they were first given to the world, are,—a *Hebrew Grammar* entitled *Michlol*—i.e., "Perfection," Venice, 1545; Leyden, 1631, &c.: a *Lexicon* of Hebrew roots entitled *Sepher Sforasain*, Naples, 1490; Venice, 1592, &c. These works, which have been frequently reprinted, furnished Buxtorf with the materials of his *Lexicon and Thesaurus*. The Grammar, in particular, has served as a model for all the Hebrew Grammars that have appeared since it was written. Kimchi wrote commentaries on almost all the books of the Old Testament. Some of these have been often printed separately; and a

Kilsyth
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collective edition of them was published at Gotha in 1713, in 3 vols. 4to. Kimchi was an obstinate Jew, and cherished an implacable and furious hatred to the name of Christ, which often breaks out in his most abstract speculations. A *catalogue raisonné* of his works, which include a Talmudic dictionary, is given in *Wolf's Bibliotheca Hebraica*, Hamburg, 1715-33.

KINBURN, a fortress of Russia, very strongly situate on a small peninsula at the mouth of the Dnieper, on its W. side. Opposite to it is the fortress of Oczakoff: the two together entirely command the entrance of the river. Near Kinburn in 1787 the Russians under Suwaroff gained a signal victory over the Turks. On the 17th of October 1855, this fortress capitulated, after a heavy bombardment of several hours, to a combined British and French force under Admirals Stewart and Bruat.

KINCARDINE, a seaport and borough of barony, Perthshire, on the left bank of the Frith of Forth, 21 miles W.N.W. of Edinburgh. It is irregularly, but not ill built, and has a good quay and harbour, affording anchorage to ships of 300 to 400 tons. There is a considerable coasting trade, chiefly in coals; and shipbuilding is carried on to some extent. Pop. 2697.

KINCARDINESHIRE, or THE MEARNS, a maritime county of Scotland, bounded N. and N.W. by Aberdeenshire, S.W. and S. by Forfarshire, and E. by the German Ocean. Its form is that of an isosceles triangle, with the apex pointing N.E.; its greatest length from the mouth of the N. Esk to that of the Dee is 81 miles, breadth from Dunnottar to Mount Battock, 22 miles; area, 243,200 acres. It may be viewed as consisting of five natural divisions,—the Coast side, Garvock, the How (or Hollow) o' the Mearns, the Grampians, and Deeside. The first of these is the most productive portion of the county; the land S. of Stonehaven renting at from L.2 to L.4 per acre. From the Esk to Bervie the coast is for the most part low. From Bervie to Stonehaven (about 12 miles) it presents an almost unbroken range of perpendicular rock, from 100 to 250 feet high; thence to Aberdeen it is interrupted by creeks and bays. In this district are the towns of Bervie and Stonehaven, and the small ports of St Cyrus, Johnshaven, Gourdon, Katterline, Cratoun, Skateraw, Portlethen, Findon (or Finnan, whence "finnan-haddies"), and Cove. The district of Garvock rises to an elevation of from 250 to 750 feet above the sea, and is naturally bleak and unproductive, but the industry of the inhabitants has done much to reclaim it from sterility. Planting on a more extensive scale is still greatly to be desiderated. The How o' the Mearns is a continuation of the valley of Strathmore, and takes its rise a few miles W. of Stonehaven, extending S.W. for 16 miles, with an average breadth of 6 miles. The lower portions of this fine valley were originally marshes; and ague was common among the inhabitants. It has now entirely disappeared; the marshes having been thoroughly drained, and now yielding good crops of corn. The How is watered by numerous streams; the largest are the Bervie, Luther, and Fearn,—the first specially noted as a trouting stream. The general aspect of this district is highly flourishing, but the absence of hedge-rows, and the gradual removal of plantations, never very numerous, are defects that need remedy. Rising from this valley, and running parallel with it, is a ridge of the Grampians, which intersects the county from E. to W. This sterile region is about 8 miles in breadth, and embraces the area of nearly 80,000 acres, almost entirely occupied as sheep-walks. The highest point is Mount Battock (3500 feet), the summit of which forms the point of contact of Aberdeenshire, Angus, and Kincardine. The road from the How, over the steep romantic Cairn o' Mount, leads through Glen Dye into Deeside. This district begins with the valley of the Feugh, extends for about 10 miles on both banks of the Dee, and from the point where

that river begins to divide the county from Aberdeenshire, for about 13 miles on its right bank to the sea. The land of this tract is not in general of a strong quality, but in moist seasons produces good crops. It is here also to be lamented that the plantations which adorn the face of the country are rapidly disappearing.

Of the minerals in this county, the most useful is limestone, which used to be quarried near Laurencekirk. The prevailing rock in the N. of the county is granite, and on the coast gneiss. Porphyry, conglomerate, sandstone, whinstone, &c., occur in great variety. The climate has much improved within the last 40 years, principally owing, no doubt, to the great improvements in drainage; but the high bleak hills, which extend over so much of its surface, must always exercise a chilling influence on the soil. High winds are very prevalent, and do much injury to crops. The improvements in agriculture during the present century have been very great. Among the number of those specially entitled to record as improvers on a great scale, are the late Mr Barclay Allardyce of Ury, and Mr M'Tier of Durris. With these exceptions, and a few besides, most of the improvements throughout the county are due to the energy and skill of the tenantry. The county is well furnished with roads, and is traversed by the Scottish North-Eastern and the Aberdeen and Deeside railways. Its total acreage under tillage in 1856, was 100,889½; of which there were—in wheat, 6080; barley, 7079; oats, 28,165; potatoes, 2893½; turnips, 16,853¼; grass and hay, 37,915½. The total value of agricultural produce in 1855 was estimated at L.898,588; in 1807 it was estimated at L.515,679. The number of occupants in 1856 was 1392; of landowners, from 60 to 70, about half of whom have rentals varying from L.1000 to above L.8000. The number of resident proprietors is about 20. The valued rent of land in 1674 was L.6243, 9s.; in 1815, L.94,861; in 1856, L.158,789. The farms vary in size from 20 to 400 acres. The tendency to enlarging farms is making way, as in other parts of Scotland, to the extinction of an industrious and exemplary class of the population. Farm-steadings have been greatly improved, but the accommodation for farm-servants is still extremely defective. Improvement in the breeding of stock has not been much stimulated by any local associations for that purpose, the only agricultural society in the county being limited to the district of Fettercairn, where, however, it has been of considerable benefit. The total live-stock in 1856 was 61,399,—estimated value, L.414,000. The number of horses was 4206; milch cows, 6568; total cattle, 26,449; sheep, 27,894. Fifty years ago, the paupers were 1 in 50 of the population, the average sum for their support being L.1, 16s.; in 1855 they were 1 in 26, costing each, on an average, L.4, 10s.

There are few manufactures in the county; that of woollens is carried on at Stonehaven on a small scale. There are flax spinning-mills at Bervie, distilleries at Glen Ury and Fettercairn, and breweries at Stonehaven, Johnshaven, and Laurencekirk. The salmon and white fisheries are carried on to some extent along the coast. The county town is Stonehaven, pleasantly situated on the sea-coast, near the mouth of the Carron, 16 miles S. of Aberdeen. It has a small harbour, but little trade. Pop. 3240. Bervie, a small place of 878 inhabitants, is the only royal burgh in the county. It received its charter from David II. Laurencekirk was long famous for the manufacture of wooden snuff-boxes, in which it competes with Mauchline and Cumnock. Of the old county town, Kincardine, not a vestige remains. The county returns one M.P. (constituency 920); and Bervie is a contributory burgh to Montrose. The population of Kincardineshire in 1851 was 34,743. The number of persons employed as servants and farm-workers in 1856 was about 6000; 287 lived in "bothies." There

Kincardineshire.

King,
William.

are numerous ancient cairns, and traces of Roman camps in the county. Of old castles, the most remarkable is Dunnottar, near Stonehaven, the old seat of the Keiths, Earls Marischal. It stands on a high projecting rock, nearly surrounded by the waves, and was at one time a place of great strength. The Scottish Regalia were kept here in the time of the Commonwealth, and here, in the reign of James II., a large number of Nonconformist prisoners endured such atrocity of treatment as was hardly outmatched by the Black Hole of Calcutta. On the Hill of Garvock is pointed out the "Sheriff's Kettle," where Melville, sheriff of the Mearns, about 1420, was boiled in a cauldron by some of the neighbouring barons to whom he had become offensive. Of distinguished men born in Kincardineshire were John of Fordoun the historian, George Wishart, Robert Barclay the Quaker, Bishop Burnet, Dr John Arbuthnot, Dr James Beattie, Dr Thomas Reid, and Lord Monboddo.

KING, WILLIAM, D.D., author of a famous treatise on the *Origin of Evil*, was born at Antrim in 1650. Taking orders in 1674, he was, five years afterwards, promoted to the chancellorship of St Patrick's, Dublin. When the persecution of the Anglican clergy began under James II., King, though a rigid Protestant, warmly inculcated the duty of passive obedience. "It was only," in the words of Macaulay (*Hist.*, vol. iii., p. 222), "after he had been repeatedly imprisoned by the government, to which he was devotedly attached; after he had been insulted and threatened in his own choir by the soldiers; after he had been interdicted from burying in his own churchyard, and from preaching in his own pulpit; after he had narrowly escaped with his life from a musket-shot fired at him in the streets, that he began to think the Whig theory of government less unreasonable and unchristian than it had once appeared to him." Adopting the principles of the revolution, he gave them his earnest support; and his constancy was rewarded with the deanery of St Patrick's, and, three years later, with the see of Derry. In 1702 he became Archbishop of Dublin, and held that office till his death in 1729.

As an author, King ranks among the most learned and able men of the Irish Church. After peace had been restored to Great Britain by William of Orange, he published his *State of the Protestants of Ireland under the late King James' Government*, Lond., 4to; pronounced by Burnet to be a "history as truly as it is finely writ." A far higher effort, however, was his *Discourse on the Inventions of Men in the Worship of God*, the object of which was to reconcile the Presbyterians of Ireland to the Episcopal form of church government. But the greatest of all his works was his essay *On the Origin of Evil*, published in Latin at Dublin in 1702. In this essay, he advocated what is known as the *optimist* view, which, with differences on subordinate points, is that adopted by Augustin and Leibnitz. According to this view, King, in common with these great thinkers, attempts to reconcile the existence of evil within the government of a perfectly holy, good, and powerful being, by treating it as the necessary result of creature limitation. His work attracted great attention both at home and abroad. Among its assailants were Leibnitz, who, while holding the monoistic hypothesis, denied much of King's reasoning and many of his conclusions on minor points; and Bayle, the last and greatest defender of the dualistic hypothesis. King did not publish any reply to either of his assailants, but left notes of a defence, which, after his death, were given to the world by Edmund Law, Bishop of Carlisle, along with an English version of the *De origine Mali*. Of his other works may be mentioned his *Discourse on Predestination*, which has been edited, and with valuable annotations, by Archbishop Whately. King's personal character stood very high through life; and his correspondence with Swift shows him to have been a man of fine wit and great general accomplishment.

KINGS, BOOKS OF THE, canonical books of the Old Testament, embrace three portions of sacred history, viz., the reign of Solomon, the parallel histories of Judah and Israel in their divided state after his death, and the history of Judah till the beginning of the captivity. Originally they formed one book, and were first divided by the Seventy, by whom they are classed as III. and IV. Kings. This arrangement obtains in the Vulgate. The name of the book gives a very inadequate idea of its contents, unless the theocratic position of the Jewish monarchs be borne in mind, with all its anomalous relations to the prophetic power. There was present in the nation an element to be found in no other human society; and hence the peculiar lights and shadows of the recorded history. To realize this, it is only necessary to contrast the history of Jezebel in the land of the theocracy, as given by the sacred penman of this book, with that of her cousin Dido in the classic pages of Virgil. The unity of the book has been denied by few. Jeremiah is the only prophet who may be reasonably named as its author; and it is certain there is throughout a considerable resemblance to his style. In compiling the history the author refers to certain works not admitted into the canon, and not now extant. The nature of these books has occasioned considerable variety of opinion, but it seems probable that they were authentic and official documents publicly known and accessible to the nation. There are few commentaries on Kings. The most satisfactory is that by K. F. Keil, *Commentar über die Bücher der Könige*, 8vo, Moskau, 1846.

KING'S BENCH, COURT OF. See ENGLAND, § *Government and Laws*.

KING'S COUNTY, an inland county of the province of Leinster, in Ireland, is bounded on the N. by the county of Westmeath, on the E. by the county of Kildare, on the S. by the Queen's county and Tipperary, and on the W. by the counties of Tipperary, Galway, and Roscommon. According to the Ordnance Survey, it comprises an area of 772 square miles, or 493,985 acres; of which 337,256 are arable, 145,836 uncultivated, 8258 in plantations, 902 in towns, and 1733 under water.

In the earliest periods of Irish history this county formed part of the territory of Hy-Falgia, and was also known by the name of Hy-Laoighis, a denomination that comprehended also the Queen's county, Dublin, Kildare, and some other districts. The southern part of it afterwards obtained the name of Ely O'Carroll. It was also known by that of the kingdom of Offaly, and was confiscated to the crown in 1557, in the reign of Philip and Mary, during the administration of the Earl of Sussex, under the title of East and West Glenmallery. This large tract of country was then reduced into shire ground, and one portion was called the Queen's county, and the fort and town named Maryborough, in honour of Queen Mary; the western district was called the King's county; and the fort of Dangan, in honour of King Philip, was named Philipstown, and was originally the assize town, but has been superseded in favour of the more important town of Tullamore. The principal clans were formerly the O'Connors, the O'Carrolls, the M'Egans, the O'Delanys, and the O'Meaghers. These chiefs were very troublesome neighbours to the English Pale, and kept up constant skirmishes with the royal forces. The forfeitures consequent on the wars of 1641 and the revolution were extensive in this county, and the principal families attainted were the O'Carrolls, the Coghlanes, the Geohegans, and the Graces. The King's county is now divided into the twelve baronies of Ballyboy, Ballycowan, Ballybritt, Clonlisk, Coolestown, Eglis, Garrycastle, Geashill, Kilcoursey, Upper and Lower Philipstown, and Warrenstown. These are again subdivided into fifty-one parishes.

According to former ecclesiastical arrangements of Ireland, this county comprehended parts of the dioceses of Kildare, Meath, Killaloe, Ossory, and Clonfert; but under

Kings,
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King's County. the new distribution of the dioceses it is comprehended in those of Dublin, Meath, Killaloe, and Ferns.

The surface of the country is for the most part level and uninteresting, the usual elevation being less than 300 feet above the level of the sea. The great field of flötz limestone, that forms so much of the soil of Ireland, spreads itself over all but its southern portion. Beds of foliated limestone, of a greenish hue and a large granular texture, adapted for various useful purposes, are found at Tullamore. In the S.E. the Slieve Bloom Mountains extend in a direction from N.E. to S.W. for 20 miles, forming the line of demarcation between the King's and Queen's counties. They are steep and craggy, and have but one opening by which they can be crossed, called the Gap of Glandine. They consist of a nucleus of clay, surrounded by sandstone, with tracts of irreclaimable bog at their base. Pure white clay, of a quartzose nature, is found in them. Croghan Hill, about 3 miles N. of Philipstown, one of the most fertile and elevated of the eminences in the northern extremity of the county, rises above the surrounding level to the height of about 500 feet, clothed with verdure to its summit. It is composed of trap and flötz limestone. On those parts of its surface the basis of which is lime, the soil is extremely barren; whilst on the other parts it is peculiarly fertile, producing, from time immemorial, good crops of oats and potatoes, without manure. The difference is so marked, that the line of junction of the two formations can be traced by the verdure on the surface. Another elevation of the country, but less remarkable than that of Croghan, is the Hill of Cloghan, between the River Brosna and the Slieve Bloom Mountains. Numerous and abundant springs gush from it on all sides. The minerals found here are iron in small quantities, manganese, ochre, chalk, and potters' clay. The only river that can strictly be considered as belonging to the county is the Brosna, which rises in the county of Westmeath, and discharges itself into the Shannon. This latter river forms a considerable part of the western boundary of the county. The Barrow is its boundary to the S.E., and the Boyne skirts a small portion of its north-eastern extremity. The Lesser Brosna, also a branch of the Shannon, divides the county from Tipperary. The only lake within the county is Lough Pallas, of inconsiderable dimensions. The divisional line which separates the Queen's county passes through the middle of Lough Annagh, the northern portion of which is therefore considered as belonging to the King's county. It is of inconsiderable size, not covering more than 315 acres.

The soil is in general either a deep moor or a shallow gravelly loam; the former is the more productive in dry seasons, the latter in moist. Limestone is abundant in most parts. The pastures, though not luxuriant, form good sheep walks; that on the more mountainous tracts has proved excellent for young cattle. In reclaimed bog, corn crops are some weeks later in ripening than elsewhere, although the natural vegetation is earlier than in the upland pastures. A considerable portion of the Great Bog of Allen is in this county, which altogether contains about 146,000 acres, consisting either of flow bogs or coarse pasture land. The extent of the bogs may amount to about 120,000 acres, of which about one-third is capable of improvement for cultivation, by a system of perfect draining, followed by a coating of from 3 to 4 inches of clayey gravel, which occurs abundantly near the edges of most of the bogs. On the whole, including the elevated pastures, 45,000 acres are susceptible of improvement for cultivation; 94,000 acres might be drained, and 7000 acres are not improvable so as to repay the outlay. The returns of the number of inhabitants at various periods are as follow:—

1760.....De Burgo,	45,618	1831.....Census,	144,225
1792.....Beaufort,	74,500	1841....."	146,857
1813.....Census,	113,226	1851....."	112,030
1821....."	181,088		

King's County.

The density of the population, which in 1841 was 190 persons to the square mile, had diminished in 1851 to 145 persons, being a decrease at the rate of 45 inhabitants on each square mile.

The proportion of Protestants to Catholics is about one to four; the number of Dissenters is inconsiderable.

The county was represented in the Irish parliament by six members—two for the county at large, and two for each of the boroughs of Philipstown and Banagher. The boroughs were deprived of the right of returning members at the Union; and as no change has since been made, the county is now represented by only two members.

The number of children receiving education in public schools was, in—

Date.	Boys.	Girls.	Sex unascertained.	Total.
1821.....	5531	2601	...	8,132
1824-26.....	5787	3929	423	10,139

Of the numbers stated in the latter return, 2064 were of the Established Church, 7959 Roman Catholics, 22 Dissenters, and 94 whose religious persuasion was not ascertained. The total number of schools was 254, thirty of which, containing 1854 pupils, were supported by grants of public money; 24, containing 1404 pupils, by voluntary subscriptions; and the remaining 200, containing 6881 pupils, were maintained by the fees of those instructed. In 1851 the number of schools and of pupils attending them was ascertained to be as follows:—

Schools.	No. of Schools.	No. of Children.		
		Males.	Females.	Total.
National.....	60	1880	1863	3743
Church education.....	18	278	358	636
Endowed.....	1	23	18	41
Boarding.....	4	96	25	121
Private.....	57	692	601	1293
Parochial.....	15	266	223	489
Free.....	4	77	89	166
Regimental.....	1	35	38	73
Mission.....	3	76	94	170
Workhouse.....	3	564	669	1233
Gaol.....	1	...	54	54
Total.....	167	3987	4032	8019

The crops usually raised are wheat, oats, barley, and potatoes. Green crops are very general; rye-grass is much encouraged for early feeding. Great attention is paid to the rearing of horses, in consequence of which the county can boast of a fine breed. The uplands and moors are chiefly employed in feeding young cattle and sheep. The wool of these latter is highly esteemed at Ballinasloe. In the northern baronies there are many dairies. Lime, and limestone gravel, either by itself or formed into a compost with the gatherings of the farm refuse, constitute the general manure. The gravel burned in heaps, with the parings of the moors, produces very heavy crops. The produce of wheat on good lands averages twelve barrels of 20 stones per Irish acre, and on some choice lands has amounted to seventeen barrels. The crops grown, and the amount of land in cultivation since 1847, according to the agricultural returns collected by the Irish government, was as follows:—

King's
County.King's
County.

Year.	Corn, Beans, and Pease.				Other Crops.				Flax.	Meadow and Clover.	Total extent of land under Crops.
	Wheat.	Oats.	Barley, Bere, Rye, Beans, and Pease.	Total.	Potatoes.	Turnips.	Green Crops.	Total.			
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1847	24,881	41,020	9,120	75,021	6,560	11,134	2242	19,936	123	34,192	129,272
1848	23,251	35,646	9,164	68,061	20,001	8,737	1178	22,916	101	39,487	137,565
1849	23,523	36,209	11,519	71,251	14,356	11,874	2552	28,732	57	36,401	136,491
1850	20,410	38,787	11,471	70,668	17,907	9,418	3236	30,561	79	40,348	141,656
1851	14,192	39,868	13,042	67,102	15,293	11,783	5311	32,387	264	38,785	138,538
1852	13,100	41,791	10,674	65,565	16,621	10,729	5056	32,406	320	40,774	139,065
1853	13,942	37,383	8,345	59,670	17,897	10,681	3803	32,381	197	39,890	132,138
1854	17,767	33,174	6,335	57,276	21,038	8,705	2666	32,409	214	38,857	128,756
1855	18,502	32,489	5,636	56,627	21,725	9,343	2533	33,651	254	39,896	130,428

The number of Holdings, and the amount of the different descriptions of Live Stock in the County in the following years were :—

Year.	No. of Hold- ings.	Horses.			Mules.	Asses.	Cattle.			Sheep.		Pigs.		Goats.	Poultry.
		2 Years old and upwards.	1 Year old and under 2.	Under 1 year old.			2 Years old and upwards.	1 Year old and under 2.	Under 1 year.	1 Year old and upwards.	Under 1 year.	1 Year old and upwards.	Under 1 year.		
1847	14,840	No. 13,405	No. 1416	No. ...	No. 4604	No. 38,538	No. 10,209	No. 53,263	No. 24,351	No. 7413	No. 8,065	No. 3210	No. 160,696		
1848	14,370	11,766	1009	1027	898	4408	29,274	10,711	7,074	56,886	17,599	5028	7,432	3620	159,039
1849	12,838	10,699	1038	1096	839	4067	27,960	11,644	7,400	49,276	16,180	5905	8,237	3461	141,554
1850	11,923	10,991	856	943	817	4212	29,804	10,882	7,292	47,605	20,947	4688	10,762	4032	153,554
1851	11,331	10,399	851	1216	860	4695	30,039	11,038	7,476	55,973	22,257	5997	13,480	4667	162,296
1852	10,649	10,181	1101	1418	838	4782	29,628	12,326	8,765	70,195	27,660	8095	13,089	6335	196,012
1853	10,460	10,287	1355	1615	839	4872	31,195	13,543	9,868	77,598	39,360	5827	14,263	7006	192,089
1854	10,674	9,953	1611	2005	842	4765	36,252	11,757	9,185	90,356	48,388	5483	18,201	7434	198,543

There is every reason to suppose that the greater portion of this county was once an uninterrupted forest. Wherever the timber is protected it grows up to great size and beauty. The parts bordering upon Tipperary are richly wooded. Alder is indigenous. The ash grown here is preferred to any other by the Dublin workmen. The bogs furnish an inexhaustible supply of fuel, not only from their own peculiar vegetation, but from the trunks and roots of trees raised from them, which produce a quick and lively fire. Notwithstanding the great prevalence of bog, the general surface of the land is of sufficient elevation to afford great facilities for conducting the superfluous moisture to the rivers which intersect the country in all directions. The fences are generally of white thorn, which thrives remarkably well here.

The condition of the peasantry, though more comfortable than in some other parts of Ireland, is, notwithstanding, low in comparison with that of the English of the same class. The houses are small and poor, mostly covered with thatch, and seldom weatherproof. Earthen walls and straw roofs are preferred by most, not only from habit, but as being warmer than stone and slate. Fuel is everywhere plentiful; the bogs furnishing an inexhaustible supply of excellent quality. The food, in general, is potatoes and oatmeal. The peasantry are industrious when excited by what they deem adequate remuneration.

The only manufactures carried on are those of wool and linen; but the quantities wrought are merely sufficient for the home consumption. The Grand Canal, which crosses the county from E. to W., affords a cheap and expeditious mode of conveying its superabundant produce to other parts. Breweries and distilleries absorb much of the grain raised in the county.

Remains of antiquity of very remote date are frequent. In the Slieve Bloom Mountains there is a large pyramid

of white stones, called the Temple of the Sun, or the White Obelisk. Of Danish raths, which are numerous, the most remarkable is that in Finglas parish. A chain of moats, chiefly situated at the passes of the bogs, may be traced throughout the county. At Clonmacnois are two round towers and several stone crosses. This sequestered spot was the site of several places of religious observance, whence its name of the Seven Churches. The monastery is said to have been founded by the O'Melaghins, princes of Meath; and the castle, the detached ruins of which form a most picturesque object, to have been erected in 1214. Clonmacnois was also a bishop's see, which merged in that of Meath in 1568. There were three religious houses at Killeigh. Monasteris Monastery, founded by one of the Bermingham family, in the district called Thotmoy, was a place of great repute. Durrow was also the site of an extensive abbey. The remains of military antiquities are still more numerous. Rathmore Castle, the area of which comprehended two acres, is looked upon as the oldest in the county. At Banagher are the remains of a fortress which commanded an important pass over the Shannon. Birr or Parsonstown Castle, formerly the residence of the O'Carrolls, having become the property of the Parsons family, is now the residence of Lord Rosse, and is well known as containing the most powerful reflecting telescope in existence. Cangor Castle, in Clonlisk barony, is noted for its defence against the Irish, by whom it was ultimately taken and burned, and its garrison put to the sword.

The population is mostly rural. The towns are few and small. Philipstown, named in honour of Philip the second of Spain, was formerly the capital of the county, but in consequence of its decayed state, the assizes were some years ago transferred to the more important and central town of Tullamore. The place was formerly the site of Dingan Castle, the residence of the O'Conors, who were driven from

Kinghorn it in 1546 by Sir William Bellingham, and forced to fly to
 Kingston. Connaught. The town was taken and burned by King
 James's forces in 1690.

Parsonstown, formerly called Birr, has within a short period risen from an obscure village to the rank of a populous, well-built, and thriving town, second only to Tullamore in importance, and exceeding it in the number of inhabitants. The church is an elegant modern building of the Gothic style. In the town is a low Doric pillar, surmounted by a statue of the Duke of Cumberland, who commanded the English army during the Scotch rebellion in 1745. About a mile from the town are the barracks, capable of accommodating three regiments of infantry. Tullamore, on the Grand Canal, now the principal and assize town, owes its present improved condition to its situation on the Grand Canal, on which it is the principal town. From its central situation it has become a place of considerable business. It is also in some degree indebted for its regular, modern, and respectable appearance, to a conflagration which destroyed most of the mean and ruinous huts of which it chiefly consisted before. Its principal buildings are, the parish church, an elegant modern structure, the county gaol and court-house. The number of inhabitants in 1851 was 4928. No other town in the county, except Parsonstown and Tullamore, contains so many as 2000 inhabitants.

(N. S.—R.)

KINGHORN, a small burgh of Scotland, in the county of Fife, is situate on the Frith of Forth, on the line of the Edinburgh, Perth, and Dundee Railway, and unites with Kirkcaldy, Dysart, and Burntisland, in returning a member to parliament. It is built on the slope of a hill, close by the seashore, and is composed of old and weather-stained houses, several of which are in ruins. The streets are badly kept and irregular, and some of them steep and narrow. Nearly all the population are employed in two flax-spinning mills, turned partly by steam, and partly by water supplied by Kinghorn Loch, a beautiful lake about half a mile N. from the town, and covering about 20 imperial acres. The trade of the port is inconsiderable, and its harbour at Pettycur, which was long the principal ferry on the N. side of the Forth, is now the property of a railway company, and is visited only by a few small vessels. The buildings worthy of note are an elegant school-house, surrounded by a considerable area of play-ground, and a handsome jail of Gothic structure, built upon the site of the ancient chapel of St Leonard's. There are also a half-dilapidated parish church, and two dissenting churches. Kinghorn received charters from Alexander III., David II., James V., and James VI.; and till within a few years ago was ruled by a provost, two bailies, and several councillors: now it is governed by three managers. In early Scottish history it was a place of importance. Here Macbeth is said to have routed the Northmen, and near it stood Glamis Tower, a royal hunting-seat, which Robert II. gave to his son-in-law, Lyon, the ancestor of the Earls of Strathmore and Kinghorn. About a mile westward from the town is the precipice where Alexander III. was killed in 1285. Pop. of burgh and parish (1851), 3030. Kinghorn unites with Kirkcaldy, Burntisland, and Dysart, in sending one member to the Imperial Parliament.

KINGSBRIDGE, a market-town of England, county of Devon, at the head of an estuary of the English Channel, 32 miles S.S.W. of Exeter. The harbour is accessible to small vessels, by means of which some trade in corn, malt, leather, &c., are carried on. Kingsbridge has a free grammar school with three exhibitions at the universities. Pop. (1851) 1679, chiefly maltsters and tanners. Myrtles, orange trees, &c., grow here in the open air.

KINGSTON, the commercial capital of Jamaica, is situate on the S. coast of the island, N. Lat. 17. 57., W.

Long. 76. 49., 16 miles N.E. by rail from Spanish Town. It is built on a gentle slope ascending towards the Liguanea Plain. Beyond this is the lofty ridge of the Blue Mountains; the country around is highly cultivated, and the whole aspect of the place, approached from its magnificent harbour, is not a little imposing as well as picturesque. A nearer view reveals a state of internal disorganization and filth, pronounced by the unanimous testimony of high authorities to be utterly disgraceful to a city so wealthy and important. The streets are regular, the houses built generally of brick, with verandahs, piazzas, &c., to ward off the heat; but there is neither pavement nor sewer, and in the May and October rains torrents sweep the streets, sometimes undermining the houses; the principal thoroughfares are ploughed like river courses, and heaped with stones, rubbish, and filth; while starving dogs, swine, and carrion crows wander about at will, enjoying an atmosphere tainted with congenial odours. As a result of this extraordinary neglect on the part of the city corporation, one-eighth of the population was, in 1850, carried off in about six weeks by cholera. The harbour is completely landlocked, the long narrow reef, on the western extremity of which Port Royal stands, forming a natural breakwater within which there is anchorage for the largest ships. The entrance is narrow and intricate, and is protracted by the Apostle's Battery on the left, and Fort Charles on the right. Further in is Fort Augusta, a place of considerable strength. Kingston was founded immediately after the destruction of Port Royal, the original capital of the island, by the great earthquake in 1692. Port Royal is still, however, an inhabited place, being the naval station for the island. It contains an arsenal, and is well fortified. The principal exports from Kingston are sugar, rum, coffee, pimento, and ginger, the several quantities of which, for the nine months ending July 5, 1855, were 17,600 hhds, 10,558 puncheons, 4,528,110 lb., 4,673,323 lb. and 183,168 lb. The actual value of taxable property in the parish of Kingston in 1851 was estimated at L.700,000; the taxes, public and parochial, amounted to L.19,413. Pop. in 1844 (last census) 32,943, of whom 4253 were whites, the rest black or coloured. See JAMAICA.

KINGSTON, a flourishing town of Canada West, on the N.E. shore of Lake Ontario, county of Frontenac, 177 miles E.N.E. of Toronto. It is substantially built, chiefly of stone, and contains, among other public institutions, a handsome market-house (containing town-hall, &c.), a Presbyterian college, a mechanics' institute, an hospital, &c. Several weekly papers are published. The harbour, which is sheltered by several islands, and protected by two batteries, affords good anchorage up to 3 fathoms. The trade of the port is considerable, and increasing. The value of imports in 1854 was L.276,397, of exports L.96,570, ranking it fifth among Canadian ports, their order being Montreal, Quebec, Toronto, Hamilton, Kingston. It is in the line of the Grand Trunk Railway, and at the head of the Rideau Canal and Cataraqui River, here crossed by a bridge 1800 feet long. On the opposite bank is Fort Henry. As a military position Kingston commands the source of the central St Lawrence; and the neighbouring inlet of Navy Bay is the principal naval station on the lake. Pop. (1842) 11,585.

KINGSTON-UPON-THAMES, an ancient municipal borough and market-town of England, county of Surrey, 10 miles W. of London. It extends about a mile and a half along the river, which is crossed by a fine stone bridge of five arches, is somewhat irregularly built, and contains, among other buildings, a handsome town-hall, an ancient cruciform church much altered, and a Queen Elizabeth grammar school. Pop. 6279, chiefly employed in malting. Kingston was a place of some consequence in the days of the Anglo-Saxons; it returned representatives to parliament in

Kingston
 Kingston-upon-
 Thames.

Kingstown the reigns of Edward II. and III.; and a stone on which seven of the Anglo-Saxon kings are said to have been crowned is still carefully preserved. Numerous interesting Roman antiquities have been dug up in the neighbourhood.

Kinross-shire.

KINGSTOWN, a seaport-town of Ireland, county of Dublin, on the S. side of Dublin Bay, 6 miles E.S.E. from Dublin, by railway. Its name was changed from Dunleary to Kingstown in commemoration of the visit of George IV. in 1821. Queen Victoria landed and embarked here in August 1849. Dunleary was a small fishing village previous to 1816, when its harbour-works were commenced, an account of which will be found under **DUBLIN COUNTY**. It is now a mail-packet station, and a place of extensive trade, the returns of which, however, are included in those for Dublin. It has daily steam communication with Holyhead, Liverpool, Cork, &c. At the entrance to the harbour there is a lighthouse on each pier—that on the E. pier has a light revolving every half minute, and seen 9 miles off. An atmospheric railway, 2 miles in length, connects Kingstown with Dalkey. Pop. (1851) 10,453.

KINNAIRD'S HEAD, a promontory on the E. coast of Scotland, Aberdeenshire, about a mile N. of Fraserburgh. An old castle here is now used as a lighthouse, having a fixed light, 120 feet high, seen 16 miles off.

KINROSS, a town of Scotland, capital of Kinross-shire, is situate in an open vale on the W. side of Lochleven, 28 miles N.W. from Edinburgh. The lower and older part of the town has an irregular and antique appearance, but the more recent portion is much improved. Among the public buildings are the parish church, an elegant Gothic structure, built in 1832, and the county-hall; Free church, and two United Presbyterian churches, a savings bank, two libraries, and several charitable and benevolent institutions. On the margin of the loch, in the immediate vicinity of the town, is Kinross House, built for the residence of the Duke of York, afterwards James VII., in the event of his being prevented by the Exclusion Bill from succeeding to his brother. The town is lighted with gas. The manufactures are noticed under Kinross-shire. Pop. (1851) 2590.

KINROSS-SHIRE, a county in Scotland, bounded on the N.E., E., and S., by the county of Fife, and on the N. and W. by Perthshire, extends from E. to W. about 13 miles, and about 12 from N. to S. It comprehends an area of 77 square miles, or 49,531 English acres, and is, therefore, one of the smallest counties of Scotland.

Kinross-shire is the highest level ground in the peninsula formed by the Forth and the Tay, which was formerly called Ross, or the Promontory, and included the counties of Fife, Kinross, and Clackmannan. From this county the waters flow in every direction. The greater part of the soil is dry, though there are still considerable tracts insufficiently drained, and small portions here and there not drained at all. The subsoil consists chiefly of gravel, though there is also a considerable proportion of till. In regard to drainage and general agricultural improvement, no district has made greater advances within the last twenty years than Kinross-shire. Large tracts of moss and muir have been brought under cultivation; and the rental, which, in 1814, was only L.14,541, 10s., now amounts to L.46,354, 7s. 2d. sterling. There are several lakes in the county, the chief of which is Lochleven, in the immediate vicinity of Kinross. This lake was originally about 15 miles in circumference, and covered an area of 4312 acres; but by an extensive drainage, effected by lowering the bed of the River Leven, and completed in the year 1832, land to the extent of 1202 acres was recovered from the lake, and is now under cultivation. The lake abounds in trout, pike, perch, and eels. There is a long-established fishery (present rental, 200 guineas), the trout being a distinct species, of very delicate flavour, and highly

prized in the London and other English markets, where they bring from 1s. to 2s. 6d. per lb., according to the season of the year. There are several islands in the lake, all of which have been enlarged by the drainage. On one of these, about 4 acres in extent, stands the castle of Lochleven, celebrated as the prison of Mary Queen of Scots; and another, called St Serf's Island, extending to about 60 acres, contains the ruins of an ancient monastery, the seat of a very early Culdee settlement, which occupied much the same position in the east of Scotland as Icolmkill occupied in the west. Several streams flow into the lake, of which the principal are the Gairney, the South Quiech and the North Quiech; and the River Leven, the only stream of any note in the district, issues from its eastern extremity, and after passing through a considerable part of the county of Fife, enters the Frith of Forth at the town of Leven. The prevailing rocks are whinstone, sandstone, and limestone. Coal exists, and is wrought extensively, on the estate of Blair-Adam, on the southern boundary of the county; and it is believed that it exists also to the E. of Lochleven, on the estate of Sir G. Graham Montgomery, Bart., who is about to adopt the usual means with the view of discovering it.

Kinross-shire is divided into a number of small estates, there being very few large proprietors in it. Only about ten landowners hold of the crown; the others hold of these freeholders, the lands having been feued out to them for the most part about the end of the seventeenth and the beginning of the eighteenth centuries; hence, over a considerable part of the county, each individual farm is a separate property, cultivated, in the majority of cases, by its owner. In 1811 the number of freeholders was only 15. The valued rent is L20,250, 4s. 3d. Scots, and the real rent, as already stated, L.46,354, 7s. 2d. sterling. When the land is let to tenants, the leases vary from 14 to 19 years, except in the neighbourhood of the towns and villages, where they vary from 1 to 5 years; and the rents are all paid in money, although, in a considerable number of instances, a part of the rent varies with the variations of the fiars. The size of the farms is from 100 to 500 acres. A fair proportion of them is in grass, for which both the soil and climate are favourable; and inclosures, either of stone-walls, or hedges, or wire-fences, are universal. The principal crops are oats, barley, and wheat: wheat, both spring and autumn, having of late years been extensively sown, and found highly remunerative. Along the banks of the Gairney, there are extensive meadows, some of which are of Timothy grass, and let at from L.6 to L.8 an acre. Cleish Hills, Benarty, the Bishop Hill, and that part of the Ochils which belongs to the county, are pastured chiefly by sheep. Cultivated grass-lands are pastured partly by cattle and partly by sheep, a certain number of the latter being now kept by every farmer, and, in most cases, a part of the turnip crop being consumed by them on the field. The soil is peculiarly adapted to this mode of farming. The district is now well wooded, 1000 acres at least having been planted within the last 25 or 30 years; but the most extensive plantations are on the estate of Blair-Adam, which is not merely finely wooded, but has at least one-third added to its rental yearly from the sale of wood: a revenue which will be permanent, as young trees are regularly planted on the removal of the old.

Besides Kinross, the county town, and Milnathort, this county contains a number of villages. At both these towns several annual fairs are held, and a weekly grain market is held on Wednesday in each. For nearly 20 years, the chief manufactures have been tartan shawls and plaids, and similar woollen fabrics—a branch of trade which has proved uncertain and fluctuating; and in consequence, linen and cotton fabrics are now to some extent taking its place. A large spinning-mill in Kinross employs a considerable number of hands, and so also do the dyeing companies con-

Kinross-shire.

Kinross-
shire.

nected with the various factories in Kinross and Milnathort. In all the parishes in the county, except Cleish, there is a legal assessment for the poor. In Cleish, the heritors still assess themselves voluntarily to supplement what sum may be required, in addition to the church-door collections, for support of the poor.

Kinross-shire sends a member to Parliament along with the county of Clackmannan. Both counties are under the jurisdiction of one sheriff; and there is a resident sheriff-substitute for each, the one at Kinross, and the other at Alloa. Prior to the year 1807, Clackmannan was under the jurisdiction of the sheriff of Stirlingshire, and Kinross under that of the sheriff of Fife; but in the year just referred to, this arrangement was altered by Act of Parliament, and the counties of Kinross and Clackmannan were erected into a separate sheriffdom, the first sheriff of which was the late Lord Moncrieff.

By the Sheriff Court Act (1856), the counties of Linlithgow, Clackmannan, and Kinross, are to be united into one sheriffdom, as soon as a vacancy shall take place either in the sheriffship of Linlithgow or of Clackmannan and Kinross.

The following table gives the population, &c., since 1811:—

Years.	Inhabited Houses.	Males.	Females.	Total.
1811	1364	3466	3779	7245
1821	1419	3660	4102	7762
1831	1524	4519	4553	9072
1841	1812	4195	4568	8763
1851	1662	4305	4619	8924

The census for 1851 shows that 716 males, and 285 females, were farmers, agricultural labourers, or farm-servants; 511 males, and 244 females, were employed in the woollen cloth manufacture; 148 males, and 108 females, in the manufacture of linen; and 161 males, and 130 females, in that of cotton. In 1851, there were 4 Established churches, with 2992 sittings; 4 United Presbyterian churches, with 1762 sittings; and 6 Free churches, with 1371 sittings. There were 23 day-schools—of whom 14, with 1033 scholars, were public, and 9, with 389 scholars, private schools; Sabbath-schools, 14, with 956 scholars.

Kinross-shire comprehends the parishes of Kinross, Orwell, Cleish, Portmoak, Tullibole (now united to Fossoway), with part of Arngask, and part of Forgardenny. All these parishes (except Forgardenny), together with the parishes of Ballingry, Fossoway, and Muckart, are now in the presbytery of Kinross, and connected with the synod of Fife.

Originally the county of Kinross consisted of the two parishes of Kinross and Orwell, with the exception of certain lands which continued in connection with the shires of Fife and Perth till the year 1685. Sir Robert Sibbald states, that the disjunction of these two parishes from Fife, and their formation into a separate county, took place in the year 1426. But this is evidently a mistake; for the *Registrum Magni sigilli Regum Scotorum* shows, beyond all question, that Kinross must have existed as a separate county long prior to 1426. We find there charters of David II. and Robert II. (from 1366 to 1407) giving grants of lands, described as lying "*infra vice comitatum de Kynros*;" and the whole of the lands in question lie within the parishes of Kinross and Orwell. In 1685, there is an Act of parliament "in favour of Sir William Bruce of Kinross, Baronet, for enlarging the shire of Kinross;" a part of the preamble of which is this,—“Considering the smallness and extent of the sheriffdom of Kinross, and jurisdiction thereof, to support and maintain the state and rank of a distinct shire, as it is,” &c., &c. The act proceeds to add to the county of Kinross the parishes of Portmoak,

Kinsale
||
Kiölen.

Cleish, and Tullibole, in the shires of Fife and Perth, and those parts of the parishes of Kinross and Orwell which had previously lain in those shires. At a later date, a part of the parish of Arngask, and a part of the parish of Forgardenny, were added to the county of Kinross.

The table of the Agricultural Statistics of Scotland for 1856 gives the number of occupants in this county at 304, and the total acreage under a rotation of crops, 33,783, as follows (omitting fractions):—Wheat, 1770; barley, 2474; oats, 7659; rye, 4; bere, 13; beans, 116; peas, 35; vetches or tares, 247; turnips, 4346; potatoes, 1053; mangold, 2; carrots, 7; cabbage, 11; flax, 15; turnip seed, 44; bare or summer fallow, 168; grass and hay under rotation, 15,813. The number of horses in 1856 were 1569; cattle, 8288; sheep, 25,810; swine, 869. (W. P.—S.)

KINSALE, a parliamentary and municipal borough and seaport-town of Ireland, county of Cork, on the N.E. side of the estuary of the Bandon, about 3 miles from the sea, and 14 miles S. from Cork. The town is built principally on the side of Compass Hill, and hence has a fine appearance when viewed from the harbour; but on entering it, the streets are found to be narrow and inconvenient, some of them being so steep as not to admit carriages. The houses are for the most part antiquated in appearance, some of them having bay-windows and balconies after the Spanish fashion. The harbour is excellent, having a depth of 14 feet of water at the mouth at low ebb, and from 6 to 8 fathoms at a cable's length from the shore, with accommodation for 300 sail of vessels. Its entrance is protected by Charles Fort, now a barrack. Notwithstanding these advantages, the trade of the port is very trifling, owing to its proximity to Cork. The town is chiefly dependent on the fisheries, the proceeds of which are said to average L.500 a week. The fishing-boats of the port, called hookers, are generally of from 15 to 20 tons. Lobsters and oysters are taken along the shore. Kinsale is much resorted to in the summer season for sea-bathing. Pop. (1851) 5506. (Thom's *Irish Almanac*).

KINTORE, an ancient royal and parliamentary burgh of Scotland, Aberdeenshire, 12 miles N.W. of Aberdeen. It contributes to Elgin in returning an M.P., and gives the title of Earl to the younger branch of the Keith family. Pop. 476.

KINTYRE, or CANTYRE, (*Ceann-an-tir*, the “head of the land”), a long peninsula in the S. of Argyshire, constituting one of the five principal natural divisions of that county. It is about 40 miles in length, with an average breadth of from 6 to 7, and is connected with the district of Knapdale by the narrow isthmus of Tarbert. Kilbrennan Sound separates it on the E. from Arran. Its south-western extremity, the Mull (*Maol*, a bluff) of Kintyre, is about 10 miles from the Irish coast. Here, on the rocks called the Merchants, is a lighthouse 297 feet above the sea level, with a fixed light visible at 22 miles. The surface of this district is for the most part rugged and hilly, but there is a fair proportion of good arable land. The principal harbours on the coast are those of Campbelton, and Tarbert East and West. Of antiquities in the district, Skipness Castle is the most notable.

KIÖGE, a small town of Denmark, on a bay of the same name, in the island of Zealand, 24 miles S.W. of Copenhagen. In the roadstead of Kiöge, in 1676, a complete victory was gained over the Swedes by the combined fleets of Denmark and Holland.

KIÖLEN, the northern portion of the great Scandinavian mountain system, commencing to the N. of Trondhjem, and extending to the North Cape. It is about twice as long as the southern range, the Norrska Fiellen, but much narrower and lower, and diminishes in elevation towards the N. The culminating point is Sulitelma, near Lat. 67°, which is above 6000 feet high. See NORWAY.

Kiong-
Tehou
" "
Kippis,
Andrew.

KIONG-TCHOU, the capital of the island of Hainan, in China, is a well-built and walled city, with a population estimated at from 100,000 to 200,000. It has an excellent harbour and a large trade.

KIPPIS, ANDREW, D.D., a learned and laborious compiler of the 18th century, was born at Nottingham in 1725. Sprung from a family which had given many ministers to the Established Church, but had left it on the passing of the Uniformity Act, he cast in his lot with the Dissenters. On leaving the school of Sleaford, in Lincolnshire, he entered the theological academy at Northampton, then presided over by the learned and pious Dr Doddridge. The course extended over five years, and at the end of that time he obtained a charge at Boston, in Lincolnshire, where he remained from 1746 to 1750. Translated to Dorking, in Surrey, he ministered there for three years, and in 1753 became pastor of the Presbyterian church of Long Ditch, in Westminster. Among his predecessors in that charge had been the famous Calamy and the learned Hughes. Besides his ordinary professional duties, he took an active part in the temporal affairs of the religious body to which he belonged, managing the various trusts and funds with much adroitness and success. In 1763, he was appointed classical tutor in Coward's Academy, a training college for English dissenters, and held that office for upwards of twenty years. When another institution of the same kind was opened at Hackney, in 1786, he was made, very much against his will, one of the tutors. In 1778 he became a Fellow of the Antiquarian, and in the following year a Fellow of the Royal Society. He died in 1795, in the seventy-first year of his age. He enjoyed all his life, and very deservedly, a high character for piety, active and unobtrusive benevolence, and all the personal virtues which endear a man to his friends and to society.

Though actively engaged in professional life, Kippis was one of the most voluminous writers of his day. He contributed largely to the *Gentleman's Magazine*, and the *Monthly Review*, at that time the leading periodicals of Great Britain, and had "a main finger" in establishing the *New Annual Register*, the object of which was to counterbalance the political influence of the original work of that name. But he established a more enduring claim on the regard of posterity by his edition of the *Biographia Britannica*. He unfortunately did not live to complete the work he had begun, which, besides, was on a scale far beyond the strength of any one editor, however able. At the time of his death he had only brought it down as far as "Faust." Many new lives were incorporated, written for the most part by the editor himself, and extensive additions and corrections made on the original text. The immense labour and research of the work, and the honest desire to reach the truth, independent of all party or personal leanings, have made it one of the best books of its kind in existence. The plan, however, is defective. Instead of fusing his corrections into the original, he reprinted the text as it stood, and threw his own corrections into the form of foot-notes, which often gives the work the air of a long controversy, and swelled it beyond all reasonable bounds. The writing, though honest and careful, and evidently the best that the writer had to give, is often languid and tamely monotonous, and unrelieved either by the graces of fancy and sentiment, or by any novelty or depth of moral reflection. The articles are also conceived in a spirit of universal benevolence, which delights to dwell on the virtues of humanity, but shrinks from boldly rebuking and denouncing its follies, its vices, and its crimes. As a mere storehouse of facts, however, the work possesses a genuine value, and has not yet been superseded. Some of Kippis's longer contributions, such as his "Life of Captain Cook," were reprinted separately. He also published a volume of sermons, and prepared a collected edition of the works of Dr Nathaniel Lardner, to which he

prefixed a life of that distinguished theological scholar. He rendered a similar service to the good name of his old friend and teacher, Doddridge.

Kirby,
William.

KIRBY, WILLIAM, an eminent English naturalist, and one of the earliest, and still the most popular of British entomologists, was born in 1759, at Winesham, in Suffolk. Sent first to the school of his native village, and afterwards to the grammar school of Ipswich, he removed in due course to Caius College, Cambridge, where he took his bachelor's degree in 1781. In the following year he entered the church, and was appointed to the curacy of Barham, which office he held for fourteen years. Such time as he could steal from his pastoral duties he devoted at this period of his life to botany, of which he was an ardent student. The rector of the parish adjoining his was William Jones, well known as the author of a work on the Trinity. Under the influence of this able controversialist, Kirby's views of religion and politics became fixed and confirmed. Pious, and sincerely evangelical in his preaching, he was a strong supporter of government, and was even induced to use his pen in counterworking the spirit of free-thinking then reacting from France upon England. But he had little taste for controversy, and, retiring from that field, he devoted himself wholly to his favourite study of natural history. In a letter to a friend he describes how his attention was first drawn to the science of entomology. "Observing, accidentally, one morning a very beautiful golden bug (the 'lady-bird,' or 'cow-lady,' *Coccinella*, 22 *punctata*), creeping on the sill of my window, I took it up to examine it, and finding that its wings were of a more yellow hue than was common to my observations of these animals before, I was anxious carefully to examine any other of its peculiarities, and finding that it had twenty-two beautiful clear black spots upon its back, my captured animal was imprisoned in a bottle of gin for the purpose, as I supposed, of killing him. On the following morning, anxious to pursue my observation, I took it again from the gin and laid it on the window-sill to dry, thinking it dead, but the warmth of the sun very soon revived it; and hence commenced my further pursuit of this branch of natural history. Encouraged by some of the local naturalists to persevere, he made frequent entomological excursions, and greatly enlarged his knowledge of the science. When the Linneæan Society was founded in 1788 by Sir J. E. Smith, Kirby immediately became a member, and contributed many valuable papers to its *Transactions*. The first separate work by which he made his name widely known was his *Monographia Apum Angliæ*, published at Ipswich, in 2 vols., in 1802. This, as the first scientific treatise on the bees of England, brought him into notice with the leading entomologists, not only of his own country, but also of the Continent; and from this time he corresponded frequently with Latreille, Fabricius, Illiger, Walckenaer, and other eminent naturalists in France and Germany. In 1805 Kirby had formed the acquaintance of Mr Spence, a scientific gentleman of Hull, whose studies had lain very much in the same direction as his own. Three years later the two friends struck out between them the idea of popularizing the science which both had pursued with so much pleasure and benefit to themselves. The practical result of this idea was the work known as *Kirby and Spence's Introduction to Entomology*, one of the most popular books of science that has ever appeared in any tongue. The first volume was published in 1815; a second edition of it was called for in the following year, and a third in 1817, when, also, was published volume ii., of which a second edition was required in 1818, and a third in 1822. The bad health of Mr Spence interrupted the progress of the work for some years, and the concluding volumes (iii. and iv.), did not see the light till 1826. Seven editions (the last of them in 1856), prove that its popularity continues undiminished. The form and

Kirchheim style of the work were eminently calculated to ensure success. A series of familiar letters, couched in easy and almost gossiping terms, is made the vehicle of strictly scientific information on the structure, habits, uses and instincts of the insect world. Of the fifty-one letters comprised in the series, thirteen were written solely by Kirby, and eight by Spence, while the remaining thirty were produced conjointly. The appendix was supplied by Kirby, and the preface by his collaborateur.

In 1830, Kirby, though then in his seventieth year, was appointed to write one of the *Bridgewater Treatises*. He chose as his subject the *Habits and Instincts of Animals, with reference to Natural Theology*. The wide range of his theme drew him beyond his own proper province, and led him into tracks with which he was less familiar. But though his Treatise fell short of his earlier works in point of scientific value, it was admitted to have admirably fulfilled the purposes of the Bridgewater trust. The most important of his other works was his description of the insects introduced in Sir John Richardson's *Fauna Boreali-Americana*. A volume of sermons which he published in 1829, met with no great success.

Kirby never obtained any preferment in the church commensurate with his deserts. For fourteen years he remained curate of Barham, and in 1796, on the death of the rector of the parish, he was appointed his successor. He held the living till his death, on the 4th July 1850. Before he died, he had the satisfaction of seeing a knowledge of his favourite science widely disseminated throughout England, and numerous societies formed for its advancement. He was himself a member of most of the scientific corporations in England, on the Continent, and in the United States. A very detailed biography of him, by his friend the Rev. John Freeman, M.A., was published in London in 1852. The most valuable chapter in that work is contributed by Mr Spence, and from it most of the details of this notice have been taken. (See art. ENTOMOLOGY.)

KIRCHEIM, a town of Würtemberg, circle of the Danube, pleasantly situated on the Lauter, 30 miles N.W. of Ulm. It is well built, and has an ancient castle. There are manufactures of cotton and linen stuffs, strawplait, &c., and some trade in cattle, wool, and wine. Pop. 5256.

KIRCHER, ATHANASIUS, a celebrated historian, philologist, mathematician, and physical philosopher, was born May 2, 1602, at Geysen, a small town near Fulde in Germany. His parents were humble, but respectable, and exerted themselves to give him a good education. Having finished his studies, he joined the society of the Jesuits, where he found new means of satisfying his passion for learning, and applied himself with equal ardour to almost every department of knowledge. Being appointed to teach philosophy, and afterwards the oriental languages, in the college of Wurtzburg, he acquitted himself of this double duty in the most satisfactory manner. When the Thirty Years' War broke out he retired into France, and settled in the Jesuits' College at Avignon, where he passed two years, entirely occupied with the study of antiquities. It was during his residence in this city that he became acquainted with the learned Peiresc, who advised him to attempt to decypher the Egyptian hieroglyphics, a task to which he afterwards applied himself with great zeal, though, unfortunately, with but indifferent success. Appointed professor of mathematics at Vienna, he was preparing to return to Germany, when he received an order to repair to Rome, whither he accordingly proceeded without delay. In 1637, the pope charged him to accompany Cardinal Frederick of Saxony to Malta, where he was received by the Knights of St John with much distinction. He next visited Sicily and the kingdom of Naples, and then proceeded to take possession of the chair of mathematics in the Roman College, a

situation which he filled for eight years, and only relinquished to apply himself to more congenial pursuits. In his researches and experiments he received valuable aid from many princes and nobles of Germany, Italy, and Spain; and through their liberality was enabled to collect a splendid museum of antiquities, which he left to the Roman College, and has been frequently illustrated. He died at Rome, Nov. 28, 1680, the same day on which Bernini and Grimaldi expired.

Kircher was a man of wide and varied, but ill-digested erudition, and a most voluminous writer. He had a vast memory, and indefatigable perseverance; but was totally devoid both of judgment and critical skill. He was likewise credulous in an absurd degree; and from an idea that he could solve any question, however difficult, he stated the wildest fictions, and arrived at the most ridiculous conclusions with undoubting faith and self-complacency.

The works of Kircher are very numerous. A complete list of them is given in Sepi's account of his museum, published at Amsterdam in 1678.

The most important of them are,—*Ars Magnetica sive Conclusiones Experimentales de effectibus Magnetis*, Wurtzburg, 1631, in 4to; *Magnes sive de Arte magnetica Opus tripartitum*, Rome, 1641, in 4to; *Ars magna Lucis et Umbræ in x. libros digesta*, Rome, 1645, 1646, in folio; *Diatriba de prodigiis crucibus quæ non pridem post ultimum incendium Vesuvii montis Neapoli compaeruerunt*, Rome, 1681, in 8vo; *Scrutinium physicomedicum contagiosæ luis quæ pestis dicitur*, Rome, 1658, in 4to; *Prodromus Copticus sive Ægyptiacus, in quo linguæ Coptæ sive Ægyptiacæ quondam Pharaonica, origo, ætus, &c. exhibentur*, Rome, 1636, in 4to; *Lingua Ægyptiaca restituta, sive Institutiones grammaticales et Lexicon Copticum*, Rome, 1644, in 4to; *Edipus Ægyptiacus, hoc est universalis Hieroglyphicæ veterum Doctrinæ, temporum injuria abolitæ, instauratio*, Rome, 1652, in folio; *Latium, id est nova et parallela Latini tum veteris tum novi Descriptio*, Amster., 1671, in folio.

The most valuable of those works of Kircher's are those relating to the Coptic and Egyptian tongues, which, though now quite superseded, comprised all that was known on these points in his day; and his *Latium*, which may even now be consulted with profit for its maps and plans, and its minute descriptions of many objects of great interest, such as Hadrian's Villa.

KIRKCALDY, a royal and parliamentary borough and seaport in Fifeshire, about 12 miles N. from Edinburgh, lying along the margin of a bay on the N. shore of the Frith of Forth. It consists chiefly of one street, nearly 2 miles long (whence the name *Lang town*), with smaller streets and lanes opening into or running parallel with it. To the W. of the royalty, but within the parliamentary boundaries of the town, are the villages of Linktown, in the parish of Abbotshall, and the village of West Bridge, in the parish of Kirkhorn.

In 1334 Kirkcaldy was mortified by King David II. to the Abbey of Dunfermline, the commendator and monastery of which sold it in 1540. On 5th February 1644 it received a charter of erection and novodamus as a royal burgh from King Charles II., and in this charter he conveyed the burgh to the bailies, councillors, and community, along with the harbour and about 487 acres of land.

The government of the burgh is vested in a provost, two bailies, a dean of guild, and sixteen councillors. There are also still seven incorporated trades. In 1811 an act of parliament was obtained for its improvement, and since that time great changes have taken place on the exterior of the town.

The revenue, under the charge of the magistrates and council, for 1855-56, amounted to L.700, 10s. 10d.; the ordinary expenditure was L.530, 19s. 5d.; the nett debt, L.535, 19s. 8d..

The port, situated near the E. end of the town, consists of an outer and an inner harbour, both of which have been of late deepened and improved. The depth of the water at the entrance in spring tides is 15 feet. The management

Kirkcaldy.

Kirghiz.

of the harbour is vested in commissioners, who pay L.300 a-year for municipal purposes, and engage to clear off the debt of the town, amounting to L.11,086, 13s. 10d. The harbour revenue for 1855-56 amounted to L.1594, 5s. 11d., the expenditure to L.1351, 0s. 8d., leaving a surplus of L.243, 5s. 3d. The nett debt of the commissioners is L.14,355, 15s. 3½d.

The Kirkcaldy custom-house includes under its superintendence all the ports from Aberdour on the W. to St Andrews on the E. On 31st December 1855 the number of vessels belonging to these ports was ninety-eight, and their tonnage 8646. The vessels employed in the foreign trade for the year ending 5th January 1856 numbered—inwards, 135; and outwards, 285. The tonnage of those inwards was 15,892; and outwards, 27,283. The number of vessels employed in the coasting trade during the same period was 490 inwards, their tonnage 24,928; and outwards 1059, and their tonnage 54,262. The Kirkcaldy custom-house revenue for the year ending 5th January 1854 was L.9060; 5th January 1855, L.7020; and 31st March 1856, L.10,040.

Kirkcaldy is now the principal seat of the spinning department of the linen trade in this county. The value of goods manufactured in Kirkcaldy in 1815, when the trade was depressed, was estimated at L.125,981. It is now considerably increased. There were, in 1836, ten spinning-mills within the parliamentary limits of the burgh, turning upwards of 4895 spindles, and within these limits this trade is now greatly enlarged. There are also four bleachfields connected with the town, four iron foundries, and one coal-work near the town, at which are raised upwards of 15,000 tons of coal annually.

Among its commercial and literary institutions may be mentioned the chamber of commerce (founded in 1825), two public libraries, two news-rooms, &c.

Besides the public schools in the burgh, frequented by about 300 scholars, the parochial school in Linktown for the parish of Abbotshail, and adventure schools, which receive about 700 scholars, there is a provision for gratuitous education in schools founded by Mr Robert Philp, merchant in Kirkcaldy, who died in 1829, and left a sum of money, now amounting to upwards of L.74,500, for their support. The gross revenue of the charity for the year ending in 1856 was L.2882, 2s. 4d. The scholars at present educated on this foundation-number, in Pathhead, 280; in Kirkcaldy, 100; in Linktown and Bridgetown, 180; and in Kinghorn, 73.

The Sailor Guild, or Prime Gilt Box of Kirkcaldy, for the relief of destitute sailors and their families, has existed since 1590. Its average revenue amounts to L.110 yearly.

Dr Adam Smith, the author of the *Wealth of Nations*, was born in Kirkcaldy, and his bust, along with that of Sir Robert Peel, is placed in the town-hall.

Kirkcaldy unites with Dysart, Burntisland, and Kinghorn in returning one M.P.; parliamentary constituency, 400. Pop. 10,475.

KIRGHIZ, STEPPE OF THE, an extensive country of Western Asia, comprising the northern part of Independent Turkistan, and lying between N. Lat. 44. and 55., and E. Long. 53. and 82. It is bounded on the N. by Russian Siberia, E. by the Chinese Empire, S. by the khanats of Khokan, Bokhara, and Khiva, and W. by the Ural and the Caspian Sea.

The surface is not a mere flat plain, but is traversed by numerous mountain chains, particularly in the W. and N.W. There are a considerable number of rivers and lakes, many of the latter being salt. The extremes of heat and cold are very great; in summer the temperature often rises to 112° Fahr.; while in winter it is frequently many degrees below zero. The inhabitants are a nomadic race, almost solely occupied in the rearing of sheep, goats, horses, and

camels, which constitute their principal wealth. They relieve the monotony of their life by hunting, and not unfrequently by plundering caravans, or by attacking some neighbouring tribe. They are divided into the Great, Little, and Middle Hordes, which are again subdivided into numerous tribes, each having its own khan or chief. Pop. estimated at 2,260,000. See *ASIA*.

KIRCUDBRIGHTSHIRE, a county in Scotland, situate between N. Lat. 54. 43. and 55. 19., and W. Long. 3. 33. and 4. 34. from Greenwich, is bounded on the N. by the shires of Dumfries and Ayr, on the E. and S. by the Solway Frith and the Irish Sea, and on the W. by the county of Wigtown. It derives its name from *Caer*, a fort, the Anglo-Saxons having erected a fort in honour of St Cuthbert, near the site of the present Kirkcudbright (originally *Caer Cuthbert*), the county town. It is in length from E. to W. about 48 miles: it varies in breadth from 30 to 40 miles; and it contains 954 square miles, or 610,734 acres. This district is commonly called the *stewartry*, not the shire, of Kirkcudbright; and its judge, whose powers and duties are the same as those of a sheriff, is called a *steward*. The appellation of *stewartry* had its rise in the ancient tenure by which it was held, and the subsequent forfeiture of its lords; but the distinction between *stewartry* and *sheriffdom* is in this case purely nominal. Kirkcudbright is one of the two counties comprehended under the general name of Galloway; Wigtownshire, on the W., being the other.

About two-thirds of the surface is mountainous. A range of mountains stretches along the whole northern boundary, in the form of a vast amphitheatre, embracing nearly half the county; on the boundary with Ayrshire they are not much inferior in height to any in the South of Scotland. There are also some considerable mountains on the southern extremity, such as Criffel, 1831 feet in height; Cairnmore, 2597; and Cairnharrow, 1110. The high lands are, for the most part, covered with heath, except on a part of the northern boundary, where a narrow tract of green hills runs out between the counties of Ayr and Dumfries; and many of them are wet and mossy. In the middle of the district, the declivity is so gentle that the River Dee, at 30 miles from its mouth, is only 150 feet above the level of the sea; yet, even in the interior, there is no great extent of level ground, the greater part of the surface being occupied by rocky knolls, steep banks, and hills of a moderate elevation. On the coast, also, hills rise almost everywhere to the height of several hundred feet. The district is studded with a great number of lakes, of which there is one or more in almost every parish, though few of them are considerable. As there is much full-grown wood, the general appearance of the *stewartry* is that of a varied, rich, and interesting county, on which much capital and labour have been expended; and its natural beauties are in many places very striking.

The soil of the lower grounds is, for the most part, of a hazel colour, sometimes inclining to red, and seems to be chiefly composed of argillaceous schist in a state of decomposition. It is seldom of any great depth, and the rock, often rising above the surface, gives a rugged appearance to much even of the arable land. This soil is, however, in many instances possessed of great natural fertility, not soon injured by wet seasons, and affords plentiful crops and fine natural herbage. Clay is of no great extent, and found chiefly on the banks of the rivers. The smooth round hills accessible to the plough have, for the most part, a close subsoil, here called *till*, and do not, therefore, admit of being profitably cultivated but after an interval of several years' pasturage. Tracts of moss, which once existed, have greatly disappeared, having been converted into rich arable fields.

Much of the mountainous district is composed of granite. According to the *Agricultural Survey* there are three several districts of this rock, which occupy nearly a fourth

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of the surface. Strata of argillaceous schistus prevail in the lower parts. Some of it is of a hard, compact grain, of a blue or grayish-brown colour, for the most part breaking irregularly, but often in parallel plates, of which coarse slates have been made. With these are intermixed layers of a softer argillaceous stone, which readily yields to the weather, and is popularly known by the name of *slate band*. These rocks, which also occupy a large part of the district, are sometimes traversed by dykes of porphyry, and also by granite. In the neighbourhood of Dumfries the prevailing rock is sandstone. Limestone is found at Kirkbean, the only place in the county where it is wrought; and there are also some promising indications of coal on the estate of Arbigland, near Dumfries. In the parish of Colvend, on the Solway Frith, there is a quarry which affords millstones. Lead mines were wrought in Minnigaff and Anwoth for many years, but have been discontinued. Iron ore abounds, but, from the want of coal and wood, it is of little value. On the estate of Cally, near Gatehouse, copper has lately been discovered, but the yield has not been remunerative.

The rivers are,—the Nith, which separates this county from Dumfriesshire for about 12 miles on the N.E.; the Urr, which flows S.E. by the village of Dalbeattie, and is navigable 5 or 6 miles for small vessels; the Dee, the largest river, which enters Loch Ken, a lake almost in the centre of the county, about 8 miles in length, and in some places a mile in breadth, and, giving its name to the river (Ken), which issues from the lake, falls into the Solway Frith about 5 miles below the town of Kirkcudbright. It is navigable for 2 miles above this town for vessels of 200 tons. In spring-tides the water rises about 20 feet at Kirkcudbright, where there is a well-sheltered natural harbour, of easy access. For the last 7 or 8 miles of its course the banks of the Dee are planted. St Mary's Isle, near Kirkcudbright, is a highly ornamented spot; and the Little Ross, a beautiful island, is situated at its mouth. There are other small islands, as those of Fleet, Knockbrex, and Heston, scattered along the coast. The salmon fishery on this river was rented, some years ago, at L.900. The Fleet is remarkable for the picturesque scenery on its banks; but as its stream is circuitous towards the end of its course, a canal of about a mile in length has been cut, at the sole expense of the late Mr Murray of Broughton, by means of which the navigation to Gatehouse, about 4 miles from the sea, has been rendered easy and shorter. The Cree, a more considerable river, separates this county from Wigtonshire, and flows into the bay of Wigton, whence it is navigable to the small harbour of Carty, a little below Newton-Stewart. The rivers are nearly equidistant from each other; and the richly wooded valleys through which they flow, combined with the intervening hills or eminences, impart a character of variety and beauty to the county which is very picturesque, and is seldom surpassed. The stewartry is everywhere supplied with pure springs and rivulets. Chalybeate springs are also numerous, one of which, Lochenebreck, in the parish of Balmaghie, 7 miles from Gatehouse, is said not to be inferior in medicinal virtues to any in the kingdom.

The landed property is not divided into large estates. The number of proprietors in 1854 was 413; of whom 180 had a valuation not exceeding L.50 Scots per annum; 66 not exceeding L.100; 65 not exceeding L.200; 55 not exceeding L.500; 26 not exceeding L.1000; 14 not exceeding L.2000; 3 not exceeding L.5000; 3 not exceeding L.10,000; while there was only one (Murray of Broughton) above the last sum. The valued rent, which was taken in 1642, is L.114,637, 2s. Scots; the real rent, in 1808, was estimated at L.167,125 sterling; and in 1855 at L.213,308, exclusive of the burghs of Kirkcudbright, New Galloway, and Maxwellton. Many of the smaller proprie-

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tors cultivate their own estates. About half the county is held under deeds of entail, and no disentails have as yet taken place under the Act 11th and 12th Victoria. "The condition of the peasantry, at a period not very remote, seems to have been much depressed, and the state of husbandry rude and barbarous in the extreme." (Smith's *Survey*.) Referring to the year 1720, John Maxwell of Munshes observes that "the tenants in general lived very meanly, on kail, groats, milk, graddon ground in querns turned by the hand, and the grain dried in a pot, together with a crock ewe now and then about Martinmas. They were clothed very plainly, and their habitations were most uncomfortable. Their general wear was of cloth made of waulked plaiding, black and white wool mixed, very coarse, and the cloth rarely dyed. Their hose were made of white plaiding cloth, sewed together, with single-soled shoes, and a black or blue bonnet, none having hats but the lairds."

In 1725 potatoes were first introduced into this stewartry by William Hyland, from Ireland, who carried them on horses' backs to Edinburgh, where he sold them by pounds and ounces. During these times, when potatoes were not generally used in this country, there was for the most part a great want of food, bordering on famine; for in the stewartry of Kirkcudbright there was not as much corn produced as was necessary for supplying the inhabitants. The produce of the country in general was gray oats; and you might have travelled from Dumfries to Kirkcudbright, which is 27 miles, without seeing any other grain, except in a gentleman's croft, which in general produced bere or bigg for one-third part, another third in white oats, and the remaining third in gray oats. At that period there was no wheat raised in the country; what was used was brought from Teviot, and it was believed that the soil would not produce wheat. In the year 1735 there was no mill for grinding that sort of grain; and the first flour-mill that was constructed within these bounds was built at Clouden, in the parish of Irongray, some years after that date." (Murray's *Literary History of Galloway*, 2d edition, 1832, pp. 337-9.) Yet it was in this county that the improvements of modern husbandry were adopted, at a time when they were entirely unknown in the greater part of the kingdom. As early as the year 1750, Mr Craik of Arbigland practised the drilling and horse-hoeing of the celebrated Tull, which he ever afterwards continued to follow in the culture of beans and turnips. He enclosed and drained his estate, cleaned his fields by fallowing, applied calcareous manures, introduced sown grasses into his course of crops, and worked his plough with two horses. A few of the other proprietors followed in his steps, but their efforts were not seconded by the tenantry at large. It is only since the end of last century that modern husbandry has made any considerable progress, but it is now quite general. The following is the proportion of crops, according to the agricultural statistics procured in 1856 by the Highland Society. The total acreage under rotation of crops was 120,792; of which the constituent crops were,—wheat, 2441; barley, 1464; oats, 33,753; rye, 58; bere, 55; beans, 503; pease, 2; tares, 84; turnips, 15,154; potatoes, 3112; mangold, 100; carrots, 46; cabbage, 10; rape, 153; flax, 9; turnip-seed, 26; bare fallow, 287; grass and hay under rotation, 63,707. Total stock, 353,869—being, horses for agriculture, 5190; other horses, 793; milch cows, 9107; other cattle, 24,012; calves, 6731; sheep, 301,603; swine, 6433.

A great impetus has lately been communicated to agriculture in this county, by the regular and cheap communication with Liverpool by means of steam navigation. The farmers have thus a ready outlet for their disposable produce, corn, cattle, and sheep, and receive cash payments. Instead of being, as formerly, far from a market, and forced, in consequence, to sell to corn-dealers, a class of men with whom bankruptcy was anything but uncommon; the far-

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mers are now, as it were, placed in the very vicinity of the best market, and are freed from all risk of non-payment. By these favourable circumstances, a spirit of improvement and enterprise has been roused which has changed the face and character of the county. Nothing, indeed, has ever effected so important a change in the circumstances of this county as the introduction of steam navigation. The first steam-boat seen on its shores was in 1830; and there are now six that ply regularly between it and the English coast, particularly Whitehaven and Liverpool. Their decks are covered with sheep and black cattle, whilst their holds are filled with corn. Nor is this all. These vessels have opened up channels of industry before unknown. Poultry, eggs, and butter, by being sent to the ready market of England, form a new and pretty productive source of income. Salmon, instead of being sent, as formerly, round to England by the expensive mail-carriage, is now transmitted thither by steam more directly, and at much less expense; whilst commodities required from England are obtained under the most favourable circumstances. Railways are about to be introduced. A bill has been got for forming a line between Dumfries and Castle-Douglas, a distance of 18 miles; and application is to be made in the ensuing session of parliament for a line from the latter place to Portpatrick, a farther distance of 56 miles. This railway accommodation, combined with the steam navigation already referred to, will thoroughly open up this otherwise remote county, and connect it with the most important marts of commerce.

Unlike other hilly tracts in Scotland, the land is almost universally enclosed, chiefly with stone walls, called *Galloway Dykes*. These dykes are built close, or double, as it is called, for part of their height, and afterwards single, the stones in the latter part being laid in such a manner as to allow the passage of the light through the wall. But it is now becoming a common practice to build the whole of the wall double, and, after laying a course of stones that project a little beyond its breadth on both sides, it is completed by a coping of stones laid on edge, and closely pinned.

This county is chiefly celebrated for its cattle, which form by far the most important part of its agricultural produce. They are known in every part of Britain by the name of *Galloway cattle*. Sheep are confined to the mountainous districts, where they are kept in great numbers. They are of the heath or black-faced variety, with coarse wool. A small, hardy, and active race of horses, called *Galloways*, was formerly reared here and in Wigtonshire, the other division of Galloway; but a larger breed being required for the labours of modern husbandry, the old race is very rarely to be found in a pure state. The name, however, is frequently applied to horses below full size, wherever they may have been reared.

The first road act for the stewartry of Kirkcudbright was obtained in 1779. At that period there was scarcely anything that deserved the name, except the military road from Dumfries to Portpatrick, which had been made about fifteen years before; but at present very few districts are better provided in this respect. The first good roads were made on the estate of the Earl of Selkirk, under the direction of his son Basil William Lord Daer, to whom this county owes many other improvements. In 1796, by another act of parliament, the assessments were allowed to be increased, and tolls erected; and soon afterwards a new road was made from Dumfries to Castle-Douglas, a distance of 18 miles, through a hilly, broken country, with so much attention to preserve the level, that it has seldom a rise of more than one foot in forty, and much of it is nearly a perfect level. All the principal roads made since have been done with equal judgment. The turnpike roads extend to nearly 300 miles; and the annual income obtained from tolls amount to about L.3200. The district is also well

accommodated with bridges, of which the most considerable is one over the Dee at Tongland, about 2 miles above Kirkcudbright, which has an arch of 110 feet span. It is built of sandstone, brought partly from Annan in Dumfriesshire, and partly from the Isle of Arran. It was finished in 1803, and cost upwards of L.7000.

Kirkcudbright, the county town, which was erected into a royal burgh in 1455, contained, in 1851 (including the parish), a population of 3555. It is pleasantly situated on the Dee, and is noted for the information and urbanity of its inhabitants. Societies have been formed here for a purpose rather unusual, namely, the building of houses, not for sale, but for the use of the members who compose them. Every member makes a small monthly payment into a general fund, which is employed in erecting the houses, and these, as they are finished, are assigned to the members by lot, those to whom they fall paying five per cent. on the money which their houses have cost in addition to their monthly payments; and this arrangement continues till all the members are supplied, and the societies dissolved. New Galloway, which was erected into a royal burgh in 1633, is situated at the head of Loch Ken, and contains only about 400 inhabitants. The principal villages are Creetown, at the mouth of the River Cree, on the bay of Wigtown; Gatehouse, 12 miles E. from the former, on the River Fleet; and Castle-Douglas, formerly called Carlinwark, an inland place, about 9 miles N.E. of Kirkcudbright. The others are Dalbeattie, on the River Urr; Keltonhill, noted for its cattle fairs in June and November; and Maxwellton, on the Nith, which, though in this county, belongs by its situation to the town of Dumfries, from which it is separated only by the bridge over that river. By the Reform Act, indeed, it is included within the parliamentary boundaries of that town. Previously to the passing of the Poor-law Act in 1844, the poor were supported solely by church collections, occasionally supplemented by voluntary contributions, chiefly on the part of the heritors. Legal assessments have now been introduced in every parish, except five; and the number of registered poor is 1549; that of casual poor, 712; total, 2261. The total expense for the former is L.8228; for the latter L.440; making an aggregate of L.8668; a fraction more, both as to number of paupers and amount of assessment, than the general average of Scotland. There is a poorhouse combination, comprising 14 parishes.

The inhabitants of the stewartry have few traits of character peculiar to themselves. Living remote from the capital, or any large town, they are a simple unsophisticated people, feudal and superstitious in their sentiments. A belief in witchcraft, and in the more popular superstitions, obtained till recently. They think no character superior to the minister or the laird. These peculiarities, however, are beginning to give way. Education has attained a most respectable footing; and the collision of sentiment which the people experience by the intercourse now opened up by the facilities of communication with strangers, has had a most salutary and liberalizing influence. They are an enterprising people. They send, on an average of the last ten years, about thirty young men to the university yearly; and the number of those who annually cross over to England to push their fortune, or emigrate either to our own colonies or to foreign states, is extremely great. Of these, not a few, after experiencing success in life, return to their native country with a respectable competency; and thus, by their example, stimulate others to follow their steps. Of the extent to which emigration from this county is carried, a correct estimate may be framed from the fact that, though the number of males born is about five per cent. above that of females, the latter in the stewartry exceed the former by 2674. A great number of Irish, of the lowest grade, are settled here.

Kirkcud-
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Education, as mentioned above, is in an efficient state. Some of the schools are excellent; none of them are bad; and when a vacancy now takes place the utmost pains are taken to get the best teacher to fill it. Several sums have been bequeathed by individuals for the support of schools, particularly in the parishes of Balmacellan, Dalry, and Borgue. In addition to the parish schools, there are many voluntary seminaries, about $6\frac{1}{2}$ per cent of the whole population being at school.

The people are distinguished for their religious character. The Reformation began here at a peculiarly early date, namely, the beginning of the fifteenth century (*Literary History of Galloway*, p. 61), and some of the most eminent reformers and covenanters were connected with this county. The persecution in the times of Charles I. and his son Charles II. raged most hotly here. The graves of martyrs are to be found, not only in almost every churchyard, but even in many of the wildest moors. Presbyterianism still continues predominant. In addition to twenty-eight parish churches, there are three chapels of ease belonging to the establishment; seven churches in connection with the United Presbyterian Synod; thirteen Free Churches; one belonging to the Reformed Presbyterian Synod (Cameronians); one Episcopalian place of worship, and four Roman Catholic chapels.

The stewartry could boast of a greater number of monasteries than any other county in Scotland. These were Dundrennan, St Mary's Isle, and Tongland, founded in the twelfth century by Fergus, Lord of Galloway; Lincluden, by his son Uchtred; and Sweetheart, or New Abbey, founded in the thirteenth century, by Dervorgille, daughter of Alan, last Lord of Galloway, and mother of John Baliol, the competitor for the throne. Of Dundrennan, Lincluden, and New Abbey, the remains are comparatively entire; while the vestiges of the other two have nearly disappeared.

The bishopric of Galloway (*Candida Casa*), both in Catholic and in Protestant times, comprehended the stewartry and Wigtonshire. It formed the most ancient see in Scotland; and in dignity was inferior only to the archbishopric of St Andrew's and Glasgow, till, in 1633, when Edinburgh was erected into a bishopric, and obtained the preference over Galloway. The bishops of Galloway were *ex officio* deans of the chapel royal of Stirling.

Some eminent men have been connected with the stewartry, as Thomas Gordon, the translator of *Tacitus*; Robert Heron, author of a *History of Scotland* in six vols.; Dr Alexander Murray, the celebrated linguist; and Dr Thomas Brown.

The occupations of the people are mainly agricultural, as there are now, properly speaking, no manufactures; the cotton mills at Gatehouse, though many years in operation, having been discontinued. Exclusive of the landed gentry, there are fully two hundred capitalists not employed in any business. The rest of the population are engaged in such retail trades and handicrafts as are needful to supply the provincial demand. In the beginning of the present century there was only one bank (then recently introduced) in the county. Now there are no fewer than a dozen. At the same date there were only four lawyers; now there are fourteen, and one messenger-at-arms. The harbours in the stewartry belong to the customs ports either of Dumfries or Wigton; and the dues levied last year on ships, or on goods carried in ships, were as follows:—Kirkcudbright, L.340; Dalbeattie, L.28; Barlochan or Palnackie, L.25; Gatehouse, L.20. It may be remarked, that a considerable portion of the shipping trade of the stewartry (as also of its banking business) centres in Dumfries. The chief exports are grain, black cattle, sheep, and wool; the principal imports are coal, lime, timber, and iron.

It has already been stated, that the mountainous districts of the stewartry are composed of granite. A granite quarry

was opened in 1830, on the estate of Cassencurrie, in the parish of Kirkmabreck, by the Liverpool Dock Company. This is at present the most important work of the kind carried on in Scotland. About 300 workmen are daily employed in it; machinery of a kind previously unknown in Galloway has been introduced; a railway has been constructed connecting the quarry with Wigton Bay, a distance of about half a mile; and a new harbour has been built at the expense of the company, the vessels belonging to which transport the stone from thence to Liverpool. Besides defraying surface damage for the line of the railway, the company pay to the landlord a sum proportional to the produce of the quarry; and thus a piece of land, which was previously covered with rock or heath, and literally worth nothing, certainly not twenty shillings, now realizes an annual rent of about L.400.

Abstract of the Population at different times.

Years.	Houses.		Persons.		Total of Persons.
	Inhabited.	Not Inhabited.	Males.	Females.	
1811	6223	196	15,788	17,896	33,684
1831	6441	146	18,869	21,621	40,590
1851	7009	225	20,223	22,898	43,121

The stewartry sends one member to parliament, the constituency in 1855 amounting to 1277. In the election for the burghs, Kirkcudbright (which contains 99 electors) joins with Dumfries, Sanquhar, Annan, and Lochmaben; and New Galloway (which contains 12 electors) with Wigton, Stranraer, and Whithorn. (T. M.)

KIRKCUDBRIGHT, the chief town of the shire of that name, a royal and parliamentary burgh of Scotland, on the left bank of the Dee, about 5 miles from its embouchure in the Solway Frith. It is finely situated and well built; and the harbour is excellent, with depth for the largest vessels. Steamers ply regularly to Liverpool, but the trade of the town is small. Kirkcudbright unites with Dumfries, &c., in returning one M.P. Pop. 2778.

KIRKBY, a prefix to the names of several English towns and parishes indicating the site of a church.

KIRKBY-LONSDALE, a market-town of England, county of Westmoreland, on the right bank of the Lune, 11 miles S.E. of Kendal. It is well built of freestone, and has a fine church, with a tower and peal of bells, and a free grammar school, with 6 exhibitions to Christ's College, Cambridge. Pop. 1675. The Earl of Lonsdale takes his title from this place.

KIRKHAM, a market-town of Lancashire, on the Preston and Fleetwood Railway, 8 miles W.N.W. of Preston. It is a place of considerable antiquity, and has a free grammar school of 1658. Pop. 2777, chiefly employed in sailcloth, sacking, and cotton manufactures.

KIRKINTILLOCH, a burgh of barony, and market-town of Dumbartonshire, on the Edinburgh and Glasgow Railway, 7 miles N.N.E. of Glasgow. Pop. 6342, employed in handloom weaving (chiefly lappets), calico printing, bleaching, &c.

KIRK-KLISIE (*The Forty Churches*), a town of European Turkey, province of Roumelia, on a slope at the foot of the Balkan, 32 miles E.N.E. of Adrianople. It is a large but poor place, with ruinous walls and citadel, narrow and dirty streets, and abundant mosques. It is famous for the manufacture of a sweetmeat "composed of the inspissated juice from boiled grapes, formed into rolls containing walnut kernels."

KIRKOSWALD, a parish and village of Ayrshire, 11 miles S.W. of Ayr, containing the ruins of Crossraguel.

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Abbey, and of Turnberry Castle, Colzean Castle and Coves, and the farm of Shanter. Burns, for a few months, attended the village school; in the churchyard are buried the prototypes of Tam o' Shanter and Souter Johnny.

KIRKWALL, a royal and parliamentary burgh of Scotland, the principal town in the Orkneys, is situated in the S.E. side of a large and well-sheltered bay in the island of Pomona. It consists mainly of one long, narrow, and somewhat dirty, though venerable-looking street, most of the houses being built in the old style, with solid walls, small irregular windows, and gables facing the street. Another street parallel to this is more modern in appearance. The chief ornament of the town is the cathedral of St Magnus, a stately cruciform building, 236 feet long by 56 in breadth, and 71 in height. It was founded in 1138 by Earl Ronald, and is early Norman in its most ancient part. The choir was lengthened by Bishop Stewart in the reign of James IV., and the nave by Bishop Reid in the reign of Queen Mary. These additions are less purely Norman than the old part. The choir has long been used as the parish church; and recently the building underwent a thorough repair by order of Government. Near it are the ruins of the Bishop's palace, in which King Haco of Norway died of a broken-heart, and of the Earl's palace, built by the ambitious Patrick Stewart, last feudal Earl of Orkney. Among the other public buildings are a town-hall and assembly rooms; there are two libraries, and a grammar school endowed by Bishop Reid. The port is chiefly frequented by coasters and passing ships from Norway and the Baltic. The principal exports are cattle and fish. Steamers ply regularly to Leith. The burgh contributes with Wick in returning one M.P.; constituency (1856) 109. Pop. (1851) 3541.

KIRRIEMUIR, a burgh of barony and market-town of Scotland, Forfarshire, 5 miles N.W. of Forfar. It is well built, and has five churches, several schools, two libraries, &c. Pop. 3518, principally employed in the manufacture of brown linen.

KIRWAN, RICHARD, an eminent chemical philosopher, was born in the county of Galway in Ireland. The date of his birth is not known, but it probably fell within the first quarter of the eighteenth century. At an early age he was sent to the Jesuit college at St Omer, in the N. of France, to be trained for the study either of law or medicine. Before he left college, the death of his elder brother put him in possession of the family estate. He immediately gave up all thoughts of professional life, and devoted himself heart and soul to his favourite sciences of chemistry and geology. Removing to England in 1779, he settled in London or its neighbourhood; and being admitted into the Royal Society, he read many valuable papers before that body, for which, in 1781, he was rewarded with the Copley Gold Medal. After an absence of ten years he returned to Ireland in 1789, and was made President of the Royal Irish Academy, and of the Dublin Society, and published various essays from time to time on his own special branches of science, and also on logic and metaphysics. He died in 1812, at a very advanced age, having for many years been looked upon as the Nestor of English chemistry.

Though Kirwan devoted his whole life to scientific inquiry, and was contemporary with Cavendish, Lavoisier, Black, Scheele, Priestley, and the fathers of modern chemistry, he did not advance the boundaries of the science by any great discovery of his own. One of the earliest of his works was his *Essay on Phlogiston and the Composition of Acids*, in which he endeavoured to reconcile the old chemistry with modern discoveries. He maintained that hydrogen, or, as it was then called, *inflammable air*, was the true phlogiston, and that every combustible substance, and every metal, contained this inflammable air as a constituent, and that combustion is just the combination of it with the vital air. At the same time, he ad-

mitted the truth of Lavoisier's theory that, during combustion, oxygen unites with the burning body; and he could not deny the experiment of the decomposition of water, though, in point of fact, it was inconsistent with his own theory of phlogiston. His book was then laid hold of by the French chemists, as affording them an excellent opportunity of showing the superiority of the new doctrines to the old. It was translated into French, with a refutation at the end of every chapter by Lavoisier, Guyton-Morveau, Monge, Berthollet, Laplace, and others. These refutations, though quite irrefragable, were so skilfully and courtously worded, that Kirwan, with a candour and liberality unfortunately too rare, abandoned phlogiston and adopted the theory of his opponents.

In 1794 Kirwan published his *Elements of Mineralogy*, in 2 vols. 8vo, a work of great merit for its day, though now quite superseded. His *Geological Essays* were less successful; but his *Essay on the Analysis of Mineral Waters* was useful, both for the number of analyses which it contained, and for the method of procedure which it inculcated. Kirwan was also the author of numerous papers in the *Transactions* of the Royal Society and of the Royal Irish Academy, on subjects connected with mineralogy and meteorology as well as chemistry.

KISCHINEFF, or **KISCHENAW**, a town of European Russia, capital of Bessarabia, on the Byk, a tributary of the Dniester, 49 miles N.W. of Odessa. It has been greatly improved and enlarged since it came into the possession of Russia (1812), and contains numerous churches and schools, an ecclesiastical college, library, gardens, fountains, &c. The trade, chiefly in agricultural produce and manufactures (woollens, leather, candles, soap, &c.), is considerable. Pop. (1849) 42,613, consisting of Russians, Turks, Jews, Greeks, Armenians, &c.

KISFALUDY, the name of two brothers of distinguished fame in the history of Hungarian literature. Sandor, or Alexander Kisfaludy, was born at Sümeg, in the county of Szalad, in 1772, and died there in 1844. His countrymen are unanimous in assigning to him the highest place among the modern lyrists of Hungary. His younger brother, Karoly or Charles, was born at Tete in 1788, and died in 1830, at the early age of 42. He attained in tragedy a distinction similar to that which his brother achieved in lyric poetry. See **HUNGARY**, § *Literature*.

KISHENAGUR, a town of Hindustan, in the province of Rajpootana, 13 miles N.E. from the city of Ajmeer. It is the capital of a small but independent principality of the same name. The rajah is of the Rhatore tribe. Kulliam Singh Rajah, of Kishenagur, entered into a treaty in 1818 with the British government, acknowledging their supremacy. Some years later serious disturbances occurred within his dominions, which he was unable to quell; and eventually, in 1832, he abdicated in favour of his son, and retired within the British territories. The town of Kishenagur is in N. Lat. 26. 33., E. Long. 74. 57.

KISHM, the largest of the islands in the Persian Gulf, lies along the coast opposite the Straits of Ormuz, about 10 miles S.W. of Gombroon. It is between 50 and 60 miles long, with a breadth of 12 miles, sterile for the most part, and in the S. hilly, but with considerable tracts of fertile land, producing wheat, rice, cotton, dates, grapes, &c. Pop. about 5000, chiefly occupied in agriculture, rearing cattle, fishing, and cotton-weaving. There are three small towns in the island, the principal of which, Kishm, on the E. side, is walled, and has a well-sheltered but shallow harbour, much frequented by coasting vessels.

KISHTEWAR, a district of Hindustan, in the dominions of Gholab Singh, the ruler of Cashmere, situated principally between N. Lat. 33. and 34. It is bounded on the N.W. by the southern range of the Cashmere Hills. The country is in general hilly and covered with wood, and

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but thinly inhabited. It is also very cold during the winter season, and presenting few temptations to invaders, has probably on that account retained its independence. It is intersected by the River Chunaub, over which there are no bridges; and at the village of Nausman, where it is 70 yards wide, it is crossed by means of a large basket slung on a tight rope, which reaches from side to side, and along which it is pulled. Kishtewar, the capital, which is the residence of a Mohammedan chief, is situated close under the southern range of the Cashmere Mountains. N. Lat. 33. 18., E. Long. 75. 46.

KISSINGEN, a well-built and pleasantly situated watering place of Bavaria, circle of Lower Franconia, on the Saale, 32 miles N. of Wurzburg. It has three saline springs (the *Rakoczy*, *Pandur*, and *Max-Brunnen*), much recommended for chronic diseases, gout, and stomach complaints. The number of visitors annually is about 4000. Between 400,000 and 500,000 bottles of the water are exported. Pop. about 1500. A little farther up the valley are the government salt works, supplied by Artesian wells, which have a regular rise and fall. One of these is about 2000 feet deep, and discharges, at intervals of three or four weeks (the discharge lasting about the same time), a column of water 80 feet high, at the rate of 100 cubic feet per minute. The propelling force is a stratum of nearly pure carbonic acid gas. The quantity of salt held in solution is from 26 to 27 per cent. The yearly product of these springs is about 1500 tons of the finest salt.

KISTNAH, or KRISHNAH, a celebrated river in the S. of India, which has its source in the Western Ghauts, not far from Sattarah, in the province of Bejapoor, which is only 50 miles in a direct line from the western sea-coast. It proceeds from hence in a south-easterly direction until it reaches Merritch, when its bulk is greatly increased by the junction of the River Wurna, formed by a variety of streamlets that fall from the Ghauts. During its course eastward it is joined by the Malpurba, Gutpurba, Beemah, and Toombuddra rivers, and pours its prodigious volume of waters, by various mouths, into the Bay of Bengal, at or a little to the southward of Masulipatam, where it forms the northern boundary of the Guntoor Circars. Its course, including its windings, may be estimated at 800 miles in length. The Kistnah is subject to two periodical inundations annually, the first and principal being caused by the S.W. monsoon, and the other by the local rains brought by the N.E. monsoon. In consequence of the rapid declivity of its waterway and rockiness of channel, this river cannot be navigated, even by small craft. An extensive system of irrigation, in connection with this great stream, is now in progress, and is estimated to cost L.150,000. The object is proposed to be effected by means of an embankment thrown across the river at the head of the Delta, and by thus accumulating the waters, to extend the benefits of irrigation to large portions of the districts of Masulipatam and Guntoor. The term Krishnah signifies black, or dark-blue, and is the name of the favourite deity of the Hindus, an incarnation of the preserving power of Vishnu. This river forms the boundary of the Deccan, according to the best Mohammedan authors.

KIT-CAT-CLUB, a convivial association which came into existence in London about the time of the Revolution. From the Whig leanings of most of its members, it gradually assumed a political character. Addison, Steele, Walpole, Marlborough, and others who belonged to it, were the fast friends of the Hanoverian succession; and it is principally through the portraits of these distinguished men, as members of the club (painted by Sir Godfrey Kneller, himself a member), that the fame of these reunions has been handed down. It was held in Shire Lane, in the house of Christopher (Kit) Cat, a pastry cook, who supplied them with mutton pies. The club dissolved somewhere about 1720.

KITTO, JOHN, the editor of the *Pictorial Bible*, and other works connected with Biblical literature, was born at Plymouth, December 4, 1804. His father was a mason, the son of a Cornish miner. In early life he bore a good character, but fell into habits of intemperance, which soon reduced his family to penury. John was his eldest child. He was a puny infant; his muscular frame was feeble, and unfitted him for the active games of boyhood. An aged grandmother, whose memory was charged with all the nursery lore of her times, was his first instructor, and found in him an apt and eager scholar. The only schooling he received was of the most ordinary kind, and for a short period; and this was rendered less efficient by a change of masters, and frequent headaches. Books, however, were a necessity of his life, and the pangs of hunger were more endurable than a scanty supply of mental food. When not twelve years old he began to write tales, and framed the plot of a tragedy, which he enacted with some of his companions. In his thirteenth year an event occurred which, though not fatal to his life, seemed to blast all his prospects of literary eminence or improvement. He had been accustomed to help his father as a jobbing mason, and on February 17, 1817, when engaged in repairing the roof of a house, he lost his footing, and fell from a height of 35 feet upon a stone pavement. His limbs were not broken, but a permanent injury was done to the skull, and the sense of hearing was totally destroyed. After eight months his general health was restored, but with "knowledge at one entrance quite shut out," a melancholy drawback, as it seemed, from the value of all the rest. Unable any longer to assist his father, he was allowed to occupy his time in whatever way he felt inclined. One of the expedients he adopted to raise a little fund for the purchase of books was that of wading at low water in Plymouth harbour in quest of yarn and old iron, by which he earned about threepence per week. When disabled by an accident from this gainful employment, he tried his hand at some rude drawings, more gaudy than truthful, which he disposed of to the children in the neighbourhood. He also prepared coloured labels in capital letters for the use of small shopkeepers or persons who let lodgings. Thus two or three years passed till he had nearly completed his fifteenth year. No resource seemed left for him but the workhouse, into which he was admitted November 15, 1819. The officers of the place, who were intelligent, worthy men, encouraged Kitto's taste for literature, and relaxed the rules of the workhouse in his favour. A journal which he began to keep about this time is a most interesting document, marking "the growth of an individual mind," and revealing the elements of the strong character that was in due time to be developed. After having learnt the art of making list shoes, a shoemaker in Plymouth offered to take him as an apprentice; but he proved to be an overbearing and inhuman tyrant on the small scale. Poor Kitto was goaded by his insults almost to madness and suicide. An appeal was made to the magistrates; his indentures were cancelled, and he obtained an order for readmission into the workhouse. A gleam of light now fell on his prospects. He attracted the notice of several literary and benevolent persons by some short essays, which were inserted in a local journal. A small fund was raised for his temporary support, and he was placed with Mr Burnard, the clerk of the guardians, to board and lodge, with the privilege of spending the day at the public library, where he prepared a small volume of miscellanies, which was published by subscription. Shortly after, Mr Groves, a dentist at Exeter, but who formerly resided in Plymouth, became acquainted with his history and circumstances; this gentleman offered to take him as gratuitous pupil, and to allow him a sum for his personal expenses. In a short time he became so far a proficient in dentistry, that, when his patron was preparing

Kitto,
John.

to go abroad on a Christian mission to Persia, Kitto thought of entering on the practice of that art in his native place, or engaging himself as an assistant to a London practitioner. But by this time his religious convictions had been greatly deepened, and he cherished a wish to be employed in connection with missionary undertakings. A vacancy occurring in the printing-office of the Church Missionary Society, Kitto was chosen to fill it. Here he remained, a short interval excepted, for nearly two years, when he went to the Society's establishment at Malta. After being in that island little more than six months, the hopes he had cherished of a domestic union were suddenly crushed, and brought on a severe illness—and this, in addition to some points of disagreement between himself and the Society, led to his return to England in the beginning of 1829, when he accepted the office of tutor to Mr Groves's two sons. He accompanied Mr Groves to Bagdad, the proposed seat of his mission, by an overland route, passing through St Petersburg, Moscow, and Astrakan. They reached their destination in December 1829. During his residence, within the short space of three years, he witnessed a siege, an inundation, the plague, and famine. At Bagdad, however, and in the travels that preceded and followed his sojourn there, he laid the foundation of his future literary eminence, and acquired, by personal observation, that knowledge of oriental life which fitted him for the great work of illustrating the Sacred Scriptures.

After the ravages of the plague, the missionary establishment was broken up. In September 1832 Kitto returned home by way of Teheran, Tabreez, Trebizond, and Constantinople. From the last named place he sailed for England, and reached Stangate Creek exactly four years after embarking at Gravesend for St Petersburg. When in sight of his native shores, he exclaimed, "Give me a little house—a little wife—a little child—and a little money in England, and I will seek no more, and wander no more!" On arriving in London he was introduced to some members of the Society for the Diffusion of Useful Knowledge, and was thus brought into connection with Mr Charles Knight. By this liberal-minded publisher he was engaged to assist in the various serial publications of the Society, and at last to prepare works of which he was the sole author. Of the latter class the most important were the *Pictorial History of Palestine* and the *Pictorial Bible*, and the last-named work is that on which his reputation is chiefly founded. Henceforward, Kitto's life was one of incessant labour. His working day was generally sixteen hours long; and though his deafness excluded him from much social enjoyment, it was not without its advantages, in producing a concentrated and unbroken attention to his literary pursuits. The *Cyclopædia of Biblical Literature*, in which he obtained the co-operation of forty scholars, British, American, and German, has superseded every previous work of the kind, and placed biblical literature on a level with the advanced scholarship of the present day.

His *Daily Bible Illustrations*, in eight small 8vo volumes, is a worthy companion of the *Pictorial Bible* and the *Cyclopædia*. But with this his life's work was done. On the morning after he had finished it he was seized with a slight paralytic stroke, and from that time was incapacitated for literary labour. Absolute rest alone afforded the slightest chance of recovering health, or even prolonging life. But his incessant toil had proved barely adequate to meet the daily wants of a large family, even with the addition of £100 per annum, granted in December 1850, from the Royal Civil List. By the exertion of some of his friends, a fund was raised to enable him to go abroad, and to make some provision for his family in the event of his decease. In the autumn of 1854 he and his family removed to Canstatt, in Württemberg. Within a few weeks after

their arrival his youngest child sickened and died, and was soon followed by his eldest daughter, a young person of great promise. He bore these bereavements with exemplary resignation, but regarded them as premonitory of his own approaching decease. On the 25th of November he was seized with a fit, which speedily proved fatal. His remains were interred in the churchyard at Canstatt, near those of his children. Besides the works already mentioned, Dr Kitto wrote *Uncle Oliver's Travels*, 1838; *History of Palestine*, 1843; *Thoughts among Flowers*, 1843; *The Pictorial Sunday Book*, 1845; *The Lost Senses, Deafness and Blindness*, 1845; *Pictorial Life of our Saviour*; and several smaller works. The *Journal of Sacred Literature* was founded by him in 1848. (Ryland's *Memoirs of Kitto*, Edin. 1856, and *Eclectic Review*, May 1856.) (J. E. R.)

KITZINGEN, a town of Bavaria, circle of Lower Franconia, on the right bank of the Main, which is here crossed by a handsome bridge, connecting the town with the suburb of Etwashausen, both of which are surrounded with walls flanked by towers. It is generally well built, carries on an active trade, and has manufactures of cotton, vinegar, gunpowder, and dye stuffs. Pop. 5170.

KIU SIU. See JAPAN.

KIZILERMAK. See HALKS.

KIZLIER, a fortified town of Russia, government of Caucasus, on the left bank of the Terek, about 60 miles from its mouth, on the Caspian. It carries on a considerable trade, being an *entrepôt* for the traffic between Persia, Astrakan, and the interior. Its exports comprise wine, brandy, silk, oil of sesame, &c. Pop. (1849) 11,200.

KLAGENFURT, a town of Austrian Illyria, capital of the duchy of Carinthia, on the Glan, 40 miles N.N.W. of Laybach. It is a dull, old-looking town, and was formerly surrounded by walls and ditches, but these were destroyed by the French in 1809, and their site is now occupied by a promenade. The streets, however, are wide and regularly built, and there are five public squares, one of which has a leaden statue of Maria Theresa. The town has many handsome buildings, among which are the palaces of the prince of Rosenberg and of the bishop of Gark, the latter of which contains fine collections of paintings, statuary, and minerals. The *Landhaus*, or House of Assembly for the estates of Carinthia, was built as early as 1391. The old castle, or *burg*, is an interesting building. One of the churches is remarkable for its fine tower, commanding an extensive view of the surrounding country. Klagenfurt has a normal school, lycæum, gymnasium, and other educational institutions, two hospitals, lunatic asylum, theatre, and public library of about 45,000 volumes. It has also the largest white-lead manufactory in the empire. The principal of its other manufactures are woollen and silk fabrics. It carries on an extensive transit trade. A canal 3 miles in length connects the town with Lake Wörth. Pop. 14,200.

KLAPROTH, JULIUS HEINRICH VON, one of the most illustrious of modern orientalists, was the son of the famous chemist, Martin Heinrich Klaproth, and was born at Berlin in 1783. His father's desire was to train him to his own profession, but at a very early age his instincts led him to study the eastern tongues, and in his zeal for them he neglected everything else. So completely was he absorbed in them, that, when he was called up for examination by the master of the gymnasium, he failed to answer the simplest questions, "You know nothing, then?" said his examiner. "Sir, I know Chinese," was the reply. "Chinese! who taught you?" "No one; I learned it alone." He brought forward the most indubitable proofs of the truth of his statement, and his father, vexed as he was to see his pet scheme thwarted, agreed to let his son take his own way. In 1801 he sent him to Halle, on the ex-

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press condition that he would there master the classical languages. In a few months the young Klaproth exhausted the resources of the place, and in 1802 removed to Dresden, publishing in that year the first number of his *Asiatisches Magazin*. Among others who were amazed by the erudition of the young philologist was the learned Count John Potocki. By his interest Klaproth was admitted into the service of Russia, and in 1804 was called to St Petersburg, where he joined the Academy of Sciences as associate for the languages of Asia. Next year, when it was determined to send an embassy to Peking, Klaproth was fixed upon as the interpreter of the party before even the ambassador was selected. The choice at last fell upon Golowkin, while Potocki was charged with the scientific part of the expedition. These arrangements were still pending when Klaproth set out alone to make observations in the less known parts of the Russian empire. Passing by Cazan and Perm, he crossed the Ural Mountains, reached Ekaterinburg, followed the course of the Irtysh from Tobolsk to Omsk, crossed the great steppes to Tomsk, and thence to Irkutsk, near the shores of the Lake Baikal, the rendezvous of the embassy. His object in taking this circuitous route was to visit the Finnish and Tartar tribes of Siberia, and study their manners, languages, and ethnology. From Kiachta they crossed Mongolia to the Chinese frontier, but had only advanced a very short way into the country when they learned that the emperor had refused to receive them. Golowkin, a weak and haughty man, had declined to go through the ordinary forms of the Chinese court ceremonial, and his obstinacy defeated the whole purpose of the embassy. Leaving his companions to return home as they chose, Klaproth spent some months in wandering among the savage tribes of Southern Siberia, studying their languages and customs. After an absence of twenty months he returned to St Petersburg in the spring of 1807, and communicated to the Academy the results, both scientific and political, of his mission. So valuable were these considered, that, in the same year, he was again despatched to prosecute his inquiries in the Caucasus, and on his return in 1809 he was loaded with honours and rewards by the Russian government. He took rank among the nobility by being made a knight of the order of Vladimir. The emperor himself gave him the title of Aulic councillor, and the academy waived its usual formalities in making him an extraordinary member. Great as these distinctions were, however, they fell short of what Klaproth seemed to regard as his due; and when the government secretly suppressed his intended publication of his travels, he began to find his stay in St Petersburg uncomfortable. Leaving the capital, he retired to Wilna, and, at the request of the Prince Czartoriski, drew up the plan of a special course of the eastern languages, in connection with the university of that city. He also drew up a catalogue of the Chinese and Manchu books in the library, and in 1811 went to Berlin for the purpose of carrying it in person through the press. Here he tendered his resignation to the Russian government, though he knew that by so doing he forfeited all his honours, privileges, and pensions. Strange rumours got afloat as to the real reasons of this infatuated act. It was even whispered that some valuable manuscripts and foreign books had disappeared from the library, and that Klaproth knew more about them than he cared to tell. At all events, in 1812, his official connection with Russia closed for ever. His first care now was to publish his travels in the Caucasus; and he retired to Warmbrunn, a small village on the confines of Bohemia and Silesia, to continue his studies in peace and quiet. When the great continental wars again broke out in 1813, even this nook became an unsafe retreat, and Klaproth was obliged to fly. In his wanderings he became acquainted with some of the generals of Napoleon, and by them he was taught to admire the great em-

peror. So great indeed was his admiration, that when Napoleon was caged in Elba, Klaproth visited the island for the express purpose of beholding his idol. He was well received, and promised a place under government by the imperial prisoner if he should ever regain his throne. The promise was made in all sincerity; but during his second reign of the "Hundred Days" the emperor was too busy to remember it, and Klaproth retired to Florence, where he lived for a time in great straits. Returning to Paris in 1815, he there met his old friend Potocki, and by his advice resolved to establish himself there as a litterateur. By this means he obtained a scanty livelihood; but his prospects were gloomy indeed, when he had the good fortune to fall in with his countryman, William Von Humboldt. By this distinguished scholar, whose studies had lain very much in the same direction with his own, Klaproth was brought under the notice of the king of Prussia, and nominated royal professor of the Asiatic languages and literature, with a handsome salary. He was, besides, presented with a large sum of money to defray the cost of printing his works, and was allowed to remain in Paris so long as he thought fit. Thus provided for, Klaproth prosecuted his researches with renewed vigour, and it was after this date (1816) that he produced nearly all the works on which his fame depends. He had acquired at the Russian court a love of pleasure and refined society, and such time as he could now steal from his books and manuscripts was spent in gratifying this taste. In the intellectual and social excitements of Paris he was in his element, and he plunged into both with an ardour far beyond his strength. In 1833 frequent palpitation of the heart seemed to indicate that disease was sapping the centre of life. Symptoms of dropsy next began to show themselves. He derived a little benefit from a journey to Berlin in 1834, when he was received with open arms by the king of Prussia and the scholars of that country. On his return to Paris he again grew worse, and his malady was aggravated by occasional fits of mental alienation. All the medical skill of Paris was of no avail. After great and protracted suffering, he died August 27, 1835. His remains were followed to the grave, in the cemetery of Montmartre, by nearly all the learned and scientific men then in Paris. Conspicuous among them was Alexander Von Humboldt.

Since Klaproth's death his fame has continued to rise, and his works are now appreciated at their full value. His merits as a philologist are very great; but his merits as a linguist are greater still. It may be safely averred, that of the great linguists of his day (and they were many), none stood higher than he. His memory, both for comprehensiveness and accuracy, was unrivalled, and served him so well that most of his papers were written without other aids than that of an occasional note. His versatility and activity of mind were equally remarkable; and, though his style was often careless and incorrect, the substance of his writing was both clear and well arranged. In whatever he wrote he aimed at accuracy above all things, and so intolerant was he of errors, that, even when the mistake was committed by a personal friend, he looked upon it as a duty to expose the offender without mercy. To quackery and charlatanism, especially in his own proper walk, he was an implacable foe; and there never was any thing, in its own way, more complete than his exposure of a *Pretended Translation of the Works of Confucius from the Original Text, a literary imposition from the Works of Dr William Schott*. This pamphlet was written to expose the pretensions of Schott, who had given out that, to understand the text of Confucius, he had called in the aid of two learned Chinese recently arrived in Germany. The persons in question were indeed Chinamen, but the one had been a cook and the other a mechanic near Canton. When Dr Schott found them, they had been earning a scanty liveli-

Klaproth,
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hood by showing themselves for money in the various towns of Germany. The Prussian government had engaged them to teach their native tongue at Halle. Klaproth proved beyond a doubt that the pretended version of Schott had been taken, not from the original text, but from the English translation of Marsham, published at Serampore, the numerous inaccuracies of which had been exposed by the French orientalist Rémusat. The severity with which he punished the impostors was great; but he often showed a similar, if not equal rigour, in cases where it was by no means so well deserved. Indeed, the irascibility of his temper caused him to be hardly less dreaded by his friends than by his enemies.

Klaproth's works are very numerous; so numerous, that, in his life, by his friend Eyriès, in the *Biographie Universelle*, the mere enumeration of them occupies ten pages. Even this long list is far from exhausting them, and the reader is referred for further particulars to the catalogue of them prepared in 1839 by M. Merlin, a Parisian bookseller. The great majority of them, however, it must be remembered, are merely short essays, pamphlets, and review articles. The subjoined list contains the most important of them:—

Asiatisches Magazin, Weimar, 1802, 2 vols. 8vo, to which Klaproth contributed the most important papers; *Reise in den Kaukasus*, Halle and Berlin, 1812-14, 2 vols. 8vo, to which two supplements were afterwards added, one on the languages of the country, and another on the geography of the Eastern Caucasus; *Abhandlung über die Sprache und Schrift der Uiguren*, Paris, 1820, 8vo; *Archives de la Littérature, de l'Histoire, et de la Linguistique de l'Asie*, St Petersburg, 1810, 4to; *Supplément au Dictionnaire Chinois du Père Basil de Glemont*, Paris, 1819, fol.; *Asia Polyglotta*, Paris, 1823, 4to, in which the Asiatic nations are distributed according to their idioms, which are divided into twenty-three classes; *Mémoires relatifs à l'Asie contenant des recherches Historiques, Géographiques, et Philologiques sur les Peuples de l'Orient*, Paris, 1826-28, 3 vols. 8vo, with maps and plates; *Vocabulaire et Grammaire de la Langue Géorgienne*, Paris, 1827, 8vo; *Examen Critique des travaux de M. Champollion jeune sur les Hiéroglyphes*, Paris, 1832, 8vo; *Chrestomathie Mandchou*, Paris, 1828, 8vo; *Notice d'une Mappemonde et d'une Cosmographie Chinoises*, Paris, 1833, 8vo; *Lettre à M. le Baron A. de Humboldt sur l'origine de la Boussole*, Paris, 1834, in which he proves that the compass was in use among the Chinese many centuries before it became known to the western world; *Tableau Historique, Géographique, Ethnographique, et Politique, du Caucase et des provinces limitrophes entre la Russie et la Perse*, Paris, 1828, 8vo, a work which has often been laid under contribution by subsequent writers on that country. Among the many works which Klaproth edited, may be mentioned Guldénstädt's *Travels in Georgia and Imeritia*, and his *Description of the Caucasian countries*; Timkowski's *Voyage à Pékin à travers la Mongolie en 1820 et 21*, Paris, 1827, 2 vols. 8vo; Count Potocki's *Travels in the Steppes of Astracan and the Caucasus*, and his *New Voyage round the Euxine*, Paris, 1829, 2 vols. 8vo; Orazio della Penna's *Brief Notice of the Kingdom of Thibet*, Paris, 1835; besides many other works bearing chiefly upon Central Asia. His contributions to the periodical press of France and Germany would fill many volumes. Many of these, especially his papers in the *Biographie Universelle*, are in their way almost unique, and of very great value.

KLAPROTH, *Martin Heinrich*, a distinguished analytical chemist of Germany, was born at Wernigerode, in Upper Saxony, December 1, 1743. Intended originally for the church, he was sent to school to receive the preparatory training. The harsh treatment he met with gave him a distaste for study, and, bent on becoming an apothecary, he entered the public laboratory of Quedlinburg, where he spent seven years, chiefly in learning to manipulate. He then removed to Hanover, where he spent two years more in the public laboratory of the place. In 1770 he went to Danzig, whence he was recalled to Berlin to assist the famous Valentin Rose. On the death of that eminent chemist in the following year, Klaproth succeeded him in his various offices. In 1787 he was made a member of the Academy of Arts, and, in the following year, of the Academy of Sciences. A few years later he became

professor of chemistry in the Royal Mining Institute, and assessor in the Supreme College of Medicine and Health. He died at Berlin, January 1, 1817.

Klarenza
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Klausthal.

The great value of Klaproth's labours lay in the skill with which he applied chemical analysis to minerals, chiefly with a view to their proper classification. It was thus that he discovered zircon in the jargon of Ceylon; that he demonstrated the presence of potash in volcanic productions; that he made known the sulphate of strontian; that he found potash in the leucite or white garnet; that he discovered in red schorl a new metal, which he named *titanium*, another in pechblende which he called *uranium*, and a third in the ore of white gold, to which he gave the name of *tellurium*. He also made known the molybdate of lead, and proved that the ore of red silver was a sulphuret of silver and antimony. Such are the most important of M. Klaproth's labours, those, in fact, which entitle him to rank amongst the most distinguished chemists of his age; but he published, besides, a considerable number of analyses of fossil substances, which may be found in the *Journal de Physique*, the *Annales de Chimie*, the *Journal des Mines*, and other collections of this sort. He also prepared a mineralogical system, which is mainly founded upon the constituent principles of minerals. His *Memoirs of Chemistry* have been collected and translated into French by Tassaert, Paris 1807, in two vols. 8vo. Lastly, he composed, in conjunction with Wolf, a *Dictionary of Chemistry*, in four vols. 8vo; a work which was translated into French by Bouillon-Lagrange and Vagel. Klaproth greatly contributed to advance the science of mineralogy, and his researches have thrown much light on the system of Werner, as well as on the classification of Haüy. His discoveries, and, above all, his particular means of analysis, have served to guide several French chemists, who are indebted to him for part, at least, of the fortunate results which have rewarded their researches.

KLARENZA, a village of the Morea, on a bay of the same name (the ancient *Cyllene*), about 15 miles from Zante. It has the remains of a mediæval fortress, from which the name of the dukedom of Clarence was long supposed to have been derived, the title being said to have come with Queen Philippa from the Hainault family, into which a daughter of the house of Clarence had married. Colonel Leake pronounces this opinion "unfounded," and says there can be no question that Clarence was the district of Clare in Suffolk. The title was first given by Edward III. to his son Lionel in 1362.

KLAUSENBURG (in Hungarian, *Colosvar*), a royal free town of Austria, the capital of Transylvania, on the Szamos, 72 miles N.N.W. of Hermannstadt. It is situated in the midst of a beautiful and fertile valley, surrounded by mountains, and consists of an inner town (subdivided into the old and the new), with walls, seats, and towers, and six suburbs. It has a fine old Gothic cathedral, besides churches and convents, an academical lyceum and library, Roman Catholic gymnasium, a Reformed and a Unitarian college, several hospitals, a theatre, public gardens, a ruined castle, and numerous palaces of the nobility. The trade and manufactures are unimportant. Pop. in 1846, 25,500, consisting of natives of Saxon descent, Hungarians, Germans, Armenian Greeks, Jews, &c., all enjoying equal rights. Klausenburg is supposed to occupy the site of the *Claudia* or *Claudiopolis* of the Romans, upon which a Saxon colony founded a new or enlarged city in 1178. King Matthias Corvinus was born here.

KLAUSTHAL, the principal mining town of the Harz district, Hanover, is situated on the top and sides of a bleak hill, at an elevation of 1860 feet, 25 miles N.E. of Göttingen. A small stream, called the Zellerbach, over which there is a bridge, divides it from the village of Zellerfeld. It contains a mint, where the precious metals of the dis-

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trict are assayed and coined, a mining-school (for the free education of young miners, with a large collection of models of machinery, &c., and a cabinet of minerals, a gymnasium, &c. Pop. 9070; of Zellerfeld, 4176, chiefly employed in, or in connection with, the mines, a few also in manufactures of iron-ware, woollen cloths, yarn, &c. The neighbouring mines employ above 2000 workmen; one of them, the *Georg-Wilhelm*, descends below the sea-level. A subterranean canal, above $2\frac{1}{2}$ miles long, conveys the ore from some of the shafts, and they are all drained by a subterranean tunnel 6 miles long. The whole machinery of the mines is moved by water-power, and all the streams of the neighbourhood are carefully husbanded for this purpose.

KLÖPSTOCK, FRIEDRICH GOTTLIEB, was born July 2, 1724, at Quedlinburg in Prussian Saxony, and was educated first at the gymnasium of that town, and afterwards at the Schulpforte, near Naumburg. Here he paid great attention to the ancient classics, and formed the resolution of writing a great epic poem. The choice of a subject perplexed him; but at this time the reign of the Emperor Henry I., known as Henry the Fowler, seems to have attracted him most. In 1745 he studied theology at Jena, and commenced in solitude the first canto of his *Messiah*. In Leipzig, where he went next year, he formed an acquaintance with Cramer, Schlegel, Rabener, Zacharia, and others, who were then publishing the *Bremische Beiträge*. The first three cantos of the *Messiah* appeared in this periodical in 1748, and excited universal attention. They made a still greater impression in Switzerland; and, when their author visited that country in 1750, the people looked upon him with a sort of veneration. In Denmark, too, they met with a very favourable reception; and Klopstock was invited to Copenhagen by the minister Bernstorff, with a small pension to finish the poem. Setting out in 1751, he travelled through Brunswick and Hamburg, and in the latter city made the acquaintance of Meta Møller, whom he married in the summer of 1754. The steps by which his acquaintance with this lady ripened into love are described with great beauty and simplicity in his well-known letters, written, when she had become his wife, to Samuel Richardson, and afterwards published in that novelist's correspondence. Four years after his marriage he had the misfortune to lose his wife, who died in childbed in 1758. From 1759 to 1766 he resided alternately at Brunswick, Quedlinburg, and Blankenberg, and afterwards at Copenhagen. In 1764 he published his *Hermann's Schlacht* (Battle of Arminius), and sent it to the Emperor Joseph, but not with the success which, in his patriotic enthusiasm, he had promised himself. After this he entered upon his investigations into the German tongue. In 1771, after the dismissal of Bernstorff, Klopstock left Copenhagen for Hamburg, as secretary to the Danish legation, and counsellor of the Margraviate of Baden. In Hamburg he finished the *Messiah*. In 1792 he married a second time. His principal amusement in winter was skating; and he was more than once in imminent danger of losing his life by it. He died March 14, 1803. His body was buried with great pomp and solemnity in the presence of thousands of spectators. A complete edition of his works was published at Leipzig, in 12 vols. 4to, 1798-1817; and they have been since reprinted in a 12mo form. The hundredth anniversary of his birth was celebrated at Quedlinburg and Altona, July 2, 1824. A monument has been erected in his honour in the former town. (For a critique on his style and works, see POETRY.)

KNARESBOROUGH, a market-town and parliamentary burgh of Yorkshire, W. Riding, 18 miles W. by N. of York. It is finely situated on a rocky slope on the left bank of the Nidd, which is crossed by two bridges, and is well built, chiefly of stone, with good streets, and a spacious market-place. It contains a handsome old Gothic

church, a free grammar school, and a literary institute, with a small library. Its manufactures of cotton and linen have greatly declined. The borough has returned two members to parliament since 1553; constituency (1856) 252. Pop. (1851) 5536. Knaresborough Castle, now in ruins, was founded in 1170 by Serlo de Burgh; it was a fortress of great strength. On the opposite bank of the river is the "Dropping Well," a petrifying spring. Further down the valley are several objects of antiquarian interest, among them is St Robert's Cave, the scene of the murder by Eugene Aram, who was a schoolmaster in the town.

KNELLER, SIR GODFREY, a celebrated portrait painter, was born at Lubeck in 1648. He studied first in the school of Rembrandt, and on the death of that great master became a pupil of Ferdinand Bole. In due time he set out for Italy to perfect himself in his art. At Rome, and more especially at Venice, he gained himself a considerable name, both by his historical pieces and portraits. During the latter part of his stay he had more commissions than he could execute. Leaving Venice, he settled for a time at Hamburg, where he became even more popular than he had been in Italy. On the invitation of the Duke of Monmouth he crossed over to England, and was introduced to Charles II. The "merry monarch" was so pleased with him that he sat to him for his portrait several times. On the death of Sir Peter Lely he found himself without a rival in England. Appointed court painter by Charles II., he held that office under James II., William III., Anne, and George I. The last named king made him a baronet, the Emperor Leopold I. created him a knight of the Roman empire, and he received similar compliments from other European princes. Till the last his industry continued unabated; and as he was frugal, even to avarice, he was able to amass a very large fortune. He died in 1723, in his seventy-sixth year.

Kneller's fame, great as it was in his own day, has not very successfully stood the test of time. His colour, always brilliant, is deficient in truthfulness; and a strong mannerism is conspicuous in many of his pictures. From a habit which he had of lengthening the oval of all his heads, there is a kind of monotony throughout his portraits. Though, on the whole, he was quite unequal to his predecessor Lely, many of his separate pieces rival his, both in loftiness of conception and force of colouring. Kneller's works are confined almost entirely to England, not more than one or two specimens having ever found their way abroad. Dr Waagen, in his *Art Treasures of Great Britain*, gives a list of his best works, with the galleries in which they hang. See PAINTING.

KNIGHT, RICHARD PAYNE, author of an essay on the *Principles of Taste*, and a distinguished patron of art and learning in England, was born at Wormsley Grange, in Hereford, in 1750. From an early age he devoted himself to the study of Greek literature and antiquities. On his father's death he succeeded to a princely fortune, of which he devoted a large proportion to the purchase of antiques, especially Greek coins and bronzes. He continued collecting till his death, in 1824, and bequeathed his magnificent cabinet (valued at L.50,000) to the British Museum. Of his numerous works, the most generally interesting is his *Analytical Inquiry into the Principles of Taste*, which, though severely reviewed by the periodical press, and especially by the *Edinburgh Review*, passed through several editions. He maintained that the most important, and, indeed, the only considerable part of beauty, depended upon association, though he insisted that there is a beauty independent of association, prior to it and more original and fundamental—the primitive and natural beauty of colours and sounds. (See art. BEAUTY.) His other works were—*An Account of the Remains of the Worship of Priapus lately existing at Isernia, in the Kingdom of Naples*; an

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Knight.

Knights. *Analytical Essay on the Greek Alphabet*, 4to, Lond. 1791; and three poems, *The Landscape*, 1794; *The Progress of Civil Society*, 1796; and the *Romance of Alfred*, in 1823. He also contributed to the *Edinburgh* and other reviews. His prose works all exhibit learning and acuteness, which, if bestowed on subjects other than whims and hobbies, might have made him a lasting name among the scholars of Great

Britain. His poems have not the slightest shadow of a claim to that title. There was probably no kind of composition for which their author was not better fitted than poetry. **KNIGHTON**, a small market-town, municipal and parliamentary borough of Radnorshire, picturesquely situated on the Teme, 8½ miles N.N.E. of the county town, to which it is a contributory borough. Pop. 1388. **Knigton**
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Knights.

KNIGHTS AND KNIGHTHOOD.

In the days of the Roman Empire, the exercise of arms was a profession. In the confusion which followed on the breaking up of that vast dominion, the profession of arms became an inheritance. The lord of land had to defend what he held from other lords who coveted it. As Christian civilization and social law prevailed, the profession of arms once more became a mere exercise. In the rude transition state of society, every man with property to lose, was necessarily a man-at-arms, ready to defend it; they who were less wealthily endowed assumed arms and sold their services. The sons of a noble family had, indeed, choice of but two vocations—they naturally went to the camp or the cloister; sometimes they commenced with the first, and when weary of their calling, sought retirement in the latter. The Christian knight was a grand idea; but he was often only an idea, too seldom a realization; his professions were, with very rare exceptions, better than his practice,—and even Bayard, eminent for his religious zeal, does not seem to have been a truer knight than Æneas, whose most resplendent title was drawn from his piety.

Apart from Christianity, the knight (in his character of warrior) may be said to have existed in all times. He who gave the first challenge to a duel,—the youthful David, who summoned and slew the gigantic Philistine, was moved by one of the most exciting impulses of chivalry—the defence of a good cause, and the reputation arising from exercising such defence with success. The virtues, and even the errors, of the Grecian leaders,—their valour, their obedience, their love for, rather than devotion to, woman, their zeal for the gods, their defiance of temptation, their consequent vices, their repentance, and the idea that triumphant bravery was a compensation for all backslidings,—these were characteristics not merely of a heathen but also of a Christian chivalry. In Odin's *Walhalla* it was the brave alone who sat at the permanent board, and drank wine out of the skulls of their craven enemies. The spirit of no coward ever glided among the groves of Elysium. The Christian knight who quailed was deemed the rejected of heaven, unless reconciliation could be effected beneath the cowl. Undaunted courage was the first qualification of a knight; to have a heart touched by love divine, and affected not less readily by human love, was perhaps his second;—these, with truthfulness, charity, and a rigid sense and practice of justice, were expected of him. They were found in the few rather than in the many. Even in the Holy Land, when St Louis led the zealous host which left France and sailed across the deep to the harmony of religious chants, sung by the very sailors as they trimmed their sails,—even under the view of that sepulchre which they had come to rescue from the infidel, and around the royal tent itself, the camp of the Christian knights was too often a scene of wild debauchery. The priest was indeed there to reprove, and to urge to a better course of life; and the knights probably repented as frequently as they offended. The system to which they had bound themselves was good, but they were continually infringing the rules of the system. The exceptions were many, it may be hoped, but the knights cannot, as a body, be said to have been firmly

"mounted on their principles." So excellent, however, was the principle, that a perfect knight was a character of almost superhuman grandeur. It has been said, it is true, that only in the system of Christian chivalry were its followers taught to refine the rudenesses of society by a tender reverence for woman, and by assaulting to the death those who would offend her, or put her honour in peril. But, in justice to the old Germans, it must be confessed, that when the too gallant Romans attacked the tribes who rallied round the valiant Herman, the honour of the German women was the jewel most highly prized by the tribes. On the other hand, Walter Scott has illustrated the most romantically chivalrous period in England—that of king Arthur—by introducing three knights, of whom he significantly says—

"There were *two* who loved their neighbours' wives,
And *one* who loved his own."

It must be remembered, however, that it was not till long after the establishment of Christianity that a religious character was given to knighthood. It has been sagely suggested that, as a system, it owes its morality to feudalism, which demanded from its champions truth, obedience, and bravery. The author of the *Letters on Chivalry and Romance*, published anonymously nearly a century ago, but well known to be from the pen of Bishop Hurd, states that chivalry, as a military order, conferred by investiture, and with certain oaths and ceremonies, sprung immediately out of the feudal constitution. When the lords of land, already referred to, were not in a state of war, the martial ardour of themselves and followers was kept up by jousts and tournaments. Knights, otherwise unemployed, rode leisurely from court to court, challenging the most famous wielders of sword or battle-axe in each city through which they passed. When the feudal policy generally prevailed throughout a great part of Europe, first the military, and then the religious, system of chivalry grew up as its natural consequence. Its effects went, however, much farther than this, it inspired not only the men, but it induced even female warriors to be moved by a passion for arms, to wander in quest of stirring adventure, to strive for the honours of knighthood and the rewards of valour, and to win fame in any way that spotless knight could win it. The romances illustrative of chivalry, and which tell us of handsome pages following their master to the field, falling in his defence, and being discovered to be love-lorn damsels, at least have no doubt a wide foundation on fact. The wife of Robert the Norman fought at his side, not under cover of his shield, like the young chief of the clan Quhele under that of Torquil, but "shoulder to shoulder," leaving him, only to rally the fugitives and lead them once more to the field. The Crusades saw many a female knight incased in steel, and valiantly doing knightly duty; and the poet of the Crusades has made use of the fact in order to brighten some of the most lively incidents of his marvellous tale.

In the state of feudalism, when society seemed antagonistic, one portion against the other, and combatants often fought, not with respect to the justice of the quarrel, but with reference to the guerdon to be got by fighting, the horrors of war were many and terrible. It was the interest

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of all to temper them by generosity, justice, and acts of mercy. The example was good for the friend of to-day who might be a foe on the morrow; and thereby the present foe was the more readily converted into friend, comrade, or partizan. When the piping time of peace had arrived there was still occupation for the knight, in addition to joust or tournament. The captives of the last, or of any fray, who had not reappeared, were to be sought out and recovered; and the going in quest of adventures for the benefit of these or of any other distressed individuals, was of the very essence of chivalry, and the great glory of knighthood. Another end in view was the instruction and edification of the young knight by travelling. He sojourned on his way at many a court, from that of king to that of baron. Each of the latter held court, inferior, indeed, to that of the sovereign, but only in numbers, not in such refinement as was consistent with stately ceremony. Hence, he learnt courtesy, or practised what he had previously learned. The courteous knight derived that qualifying name from the practice of the manners which prevailed, or ought to have prevailed, in the courts of king or noble; for

"Of court, it seems, men courtesie doe call,
For that it there most useth to abound."

The authority of Spencer, however, has been met by that of Milton to show that such practice did not hold good in later times; for courtesy, as Milton understood it, was then

"——— sooner found in lonely sheds,
With smokey rafters than in tapestried halls
And courts of princes, where it first was named,
And yet is most pretended."

These last words, however, will serve to show that the practice had not died out in the great poet's time. He, however, saw in such practice only a pretence, and he preferred the honest rough manner of the rigid republicans to the most polished style of the most courtly of the cavaliers.

To be faithful to the courteous knight was the religion of his mistress. She was, or was taught to be, as true in devotion as he was strong and ready to protect. He being of the bravest, merited the distinction of being the favourite servant of her whom he hailed as the "most fair." But it must be confessed, that this reciprocity of tenderness and service must have existed, and did naturally exist, in all states of society where women looked to men for protection, and where they knew that, if they themselves lacked faith, they would not, in their great need, find a defender.

If chivalry itself enjoined "love for the ladies," the church added to the injunction the necessity, also, of love towards God. It was held that he who felt the one must be inspired by the other; and possessing both, his happiness was secured here and hereafter. He who despised the one would be deserted of the other. There were knights who fell into the power of the Saracens, and who changed their religion. These were branded as "recreant knights," who had abandoned their God and proved false to their ladies. The double faith was impressed upon the very pages; and when the young ladies of the family whipped the latter for some peccadillo, the fair scourger would taunt him with lacking a heart that would never know how to be true to a lady. After the whipping at such hands, the embryo knight would be laid hold of by the chaplain, and gravely informed that he who could not gain the respect of a lady was ill likely to deserve an affection more divine. When young Jacques de Lelaing entered the first list in the career of his thirty tournaments, he declared that no opponent could possibly unhorse him, unless God forgot to guard, and his lady to pray for him.

The Gothic system of chivalry has by some been looked upon as a reproduction of the heroic system. This fact has been already alluded to. In Greece, especially, has the similarity been detected by some writers. The nume-

rous petty and independent governments there bear a resemblance to those of feudal times. In each system, the sword was the instrument of honour. The readers of Thucydides will not fail to remember that, at the very commencement of his history, he tells us at what period the Athenians began to leave off wearing the sword as a common appendage to the dress. When this change of fashion was effected, he recognised the extinction of a primitive sort of feudality. Times of violence had gone by; and as the wearing of the sword commonly only led to bloody quarrels, and kept up a race of ruffians, it ceased to be fashionable, because it ceased to be the distinctive sign of a courteous gentleman. It is curious that Beau Nash ordered the disuse of the sword as an appendage to the dress in the Bath Rooms, over which he ruled supreme, for the very reason adduced so many years before, with respect to the Athenians, by Thucydides. Ceasing to be a mark of nobility, noble and gentle ungirded the weapon from their loins.

But there were many things similar, besides the extinction of the two sorts of chivalry, in the surrender of their common emblem—the sword. The Abbé Banier has shown us, in his great unveiling of the mysteries of classical stories, that the gods, monsters, and other heroes of legend and poetry, were but men, described after an exaggerated and distorted fashion, just as we know that the giants and savages of the romances of chivalry were only greater or less feudal lords of a more or less dread character. As for the hapless virgins delivered by cruel parents to old dragons, from whom they are rescued by enterprising knights,—they are but maidens compelled to wed against their will, and who are carried off from their ill-matching mates just as young Lochinvar carried off the lady—too happy to fly with him—from the Forsters, the Fenwicks, and the Musgroves of Netherby. In many of these cases the heroes work under the irresistible power of enchantment. The greatest charm that impelled either classic or Gothic knight was that which acted on him from his lady's eyes. Occasionally, these charms were of too great a potentiality; but if ill results ensued, there was a happy method of getting out of the difficulty. Semele ascribed the paternity of her joyous son to the much-calumniated Jupiter: in later times, when it was obvious that anxious ingenuity could not find profit by plagiarizing such an idea, many a foundling was brought into a baronial hall, and reared to knighthood under the designation of being "fairy-born."

The courtesies of knighthood are among the best parts of the institution which has descended to us. They have existed among brave men since the time that Tubal Cain welded the first blade. Stern, but courteous, are the heroes of the Iliad: as stern, though less courteous, was Bayard, who was not averse to dealing an unfair blow, if it secured to him an advantage; and more courteous, yet perhaps even more stern, were those great captains of modern times who met at Fontenoy, and who almost deferred the battle till the next day, each being anxiously polite in requesting his adversary to commence the exterminating fire. It was the courtesy of chivalry that inspired Crillon to send vegetables to the scurvy-infected Elliot, whom he was besieging in Gibraltar; and, to come down to the last example, it was perhaps an unnecessary courtesy which inspired Sir Edward Lyons, when our own men were lying half-famished in the trenches before Sebastopol, to send a fat buck to the hostile admiral within the city. Still, courtesy between knights engaged in hostilities has ever received an universal and approving acknowledgment. When George II. sent the Garter to Prince Ferdinand of Brunswick, the great victor at Minden, his investiture took place in front of the whole army. The French General, De Broglie, learning the nature of the ceremony, generously hastened to do honour to valour by the exercise of which the French had grievously

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suffered. He, too, drew up his men within sight of the spectacle, and then saluted the new knight, whose skill and courage had been rewarded by George II. De Broglie dined in the evening in Ferdinand's tent, the guest of his great adversary. On the following day they were as fierce enemies as ever.

The alleged fact, that the courtesy of Christian knights towards women was always of a more refined nature than that of the ancient heroes, has been accounted for on the ground of the difference of civil condition in the two. Under the feudal system, the ladies could hold fiefs, and hence, it has been suggested, the respect paid by chevaliers to dames so privileged. This is judging knightly gallantry by a very debased standard. It would simply prove that chivalry respected only a wealthy virtue, and that Christian knights, like common adventurers, had regard only for rich heiresses. The truth is, that the Christian system raised the condition of woman, and made of her a companion for man. The heroes of classical times did not sit at meat with the heroines. Under chivalry it was the greatest sign of friendship for a knight and fair companion to eat off the same plate. In such case it was understood that the two were unmarried. We have instances in romance of married ladies expostulating with their jealous lords, and giving warrant of their own reserved bearing by protesting that never, since their espousal, had they eaten off the same plate with any knight, save their respective husbands. No doubt the courtesy of which we were before speaking degenerated in many cases into mere formality; and often it was practised simply because it was the fashion. Louis XIV., for instance, was so scrupulously polite towards women, that he would not pass the lowest female servant in his palace without lifting his hand to his plumed hat. The multitude of courtiers followed the fashion thus royally set; and woman became an object of adoration. But this mere empty fashion lacked the Christian and chivalrous sentiment; and the very Knights of the Holy Ghost were ever ready to degrade the fair object which they professed to worship.

It must be confessed, however, that this was a period posterior to that of the so-called Gothic Knights, by which chivalry is usually judged. In the romantic descriptions of the feudal period something must be allowed for the imagination of the romancers. Still, checking them by history, and remembering the influences most powerful at the period in question, it cannot be denied that it abounds with proofs of ennobling love and triumphs of exalted friendship. These were the more renowned at the time, because of their rarity in the ages immediately preceding, and among the rude contemporaries from whom such instances of truthful affection and friendship exacted admiration. The pyramid of praise raised in honour of the virtue of Lucretia and the continence of Scipio is a satire upon the manners of the women and of the leaders of armies of the two periods. The eulogy awarded to faithful knights is an unsatisfactory proof of the general condition of the times and of the society in which they lived. It was a part of their mission to reform both; and hence the praise which has been showered on their vocation, and the respect paid to the virtues, in the practice of which they set so bright an example. That some knights failed either to fulfil the vocation to which they had bound themselves, and to practise the virtues which were held to be inseparable from the knightly character, is only a proof that chivalry was not above poor human nature and its many errors. In Germany, perhaps, the system was carried out more completely than in any other country, and it is precisely there that the phrase, "Er will Ritter an mir werden,"—*He wants to play the knight over me*,—implied an inclination to oppress and do wrong on the part of the Ritter or knight. Our own early poets were acute observers of the defects of chivalry; but because they

satirized these, they did not, therefore, believe that chivalry itself had been founded on a wrong principle. If Chaucer raises a laugh by Sir Topaz, he makes amends by exacting respect for Cambuscan.

Bacon, in speaking of knighthood as a military dignity, remarks, that "there be now, for martial encouragement, some degrees and orders of chivalry, which are nevertheless conferred promiscuously upon soldiers and no soldiers." The rules by which the conferring of chivalry was regulated were, from very early times, irregularly observed. Bacon's words, "martial encouragement," have, perhaps, especial reference to these innovations. In the early feudal period, men who had borne themselves nobly in battle received not "martial encouragement," so much as "martial reward;" and they were dubbed knights, that

"By their light
Might all the chivalry of England move,
To do brave acts,"

In process of time, however, martial encouragement often took place of martial reward; and we frequently hear of men being made knights previous to a battle, in order to inspire them with indomitable resolution in the coming fight. The spurs were thus significant of a stimulant; and he to whose heels they were affixed before the battle felt, that if he had not to win, he had at least to prove that he deserved those appendages to, as well as symbols of, chivalry.

In certain cases this rule was no doubt found effective. At all events, it rested on a better principle than that of later times, which affixes stars of knighthood on the breasts of men with nothing to recommend them save brute courage, but whose incompetency and indifference have been more fatal to their heroically patient followers than the arms or valour of their adversaries. Bacon states, that the honours of chivalry were conferred promiscuously upon soldiers and no soldiers. The first civilian in England, or, to describe him more correctly, the first tradesman in England, who was a recipient of these honours, was that Sir William Walworth, Lord Mayor of London, who won the distinction by slaying, in presence of the king, that unlucky Wat Tyler, whose insurrectionary spirit had not been excited without something like reasonable cause. Sir William was a tradesman; but he drew profit also from less honourable sources than those of trade; and the houses along the river side, of which he was the proprietor, brought him a revenue less cleanly earned than that which Vespasian derived from his celebrated tax. The popular error, which describes the sword in the shield of arms of the city of London as one placed there in memory of the knight's service rendered by Sir William in Smithfield, does rank injustice to St Paul. The sword in the shield is the sword of the great apostle; and had the first tradesman-knight in England been moved as readily by the apostolic principle, as he was to use the sword, he would perhaps have been a less wealthy man, but he would have been none the less worthy a knight. In Bacon's own time there was a "no soldier" who attained the dignity of knight for better service rendered to the community than that which Walworth had rendered to the king. The individual in question was Spielman. His great service was in erecting a paper-mill, the first ever seen in England. This general service received the great reward of knighthood at the hands of Elizabeth. The same guerdon was given by her father for service profitable only to his own royal person. As an instance may be cited the proctor Tregonnel. This astute lawyer had been employed in the affair of the divorce between Henry and Katherine of Aragon; and his ability had been exercised to such speedy and desired purpose, that the enfranchised monarch, free to marry again, made a knight and a pensioner of the proctor whose zeal had mainly helped, and certainly hastened, the completion of the

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cherished object of the king. On the other hand, Charles I. conferred the honour of knighthood on a Scottish ecclesiastic; but the reason for such act has not been ascertained. The fact, however, remains undisputed, that, at his coronation, Charles raised to the dignity of a knight William Murray, the minister of Abdy, in Scotland. Local antiquarians may, perhaps, be able to discover for what service rendered the warlike dignity of chivalry was conferred upon this steward of the mysteries of the Prince of Peace.

Among our doughtiest old knights, not those of ballads, but of history, Sir Hugh Calvely is famous, in a double sense, for it was said of him, that he could feed like two, and fight like ten. He was as successful in love as in the lists; for he espoused the widowed Queen of Aragon, and the royal Aragonese arms were quartered on Sir Hugh's tomb towards the end of the fourteenth century. He was not the only knight or man-at-arms who wedded with a queen,—Sir William de Albini espoused the widow of Henry I.; the relict of King John was successfully wooed by the chivalrous Count de Marche; after the death of Henry V., his fair Katherine joined hands with gallant Owen Tudor; and Katherine Parr forgot Henry VIII. after she became the bride of the faithless Seymour.

Let us now consider some of the forms of knighthood, and their origin:—"And he (Pharaoh) took his ring from his own hand, and gave it into his (Joseph's) hand; and he put upon him a robe of silk, and put a chain of gold about his neck." In these words, they who think a remote origin adds respectability to a system affect to discern that Pharaoh conferred the dignity of knighthood on the son of Jacob. This was, however, but an ordinary act of royal favour, and it made Joseph no member of any companionship. Among the ancient Germans, a spear and a shield were placed in the hands of each new young member of the republic; but they symbolized only a common citizenship, and were not marks of any distinction. The equestrian order in Rome was a privileged body, at first swift horsemen, and subsequently judges, but it was not a brotherhood of knights. We have long since given up the Order of Constantine, the alleged origin of which rested on the authority of a conveniently discovered statue, which as little proved that Constantine founded the "Golden Knights," as that statue which represented Augustus, with outstretched hands, imploring Nemesis, proved that the implorer was Belisarius begging by the wayside. There are some who traced the Order of Constantine to Isaac Comnenus; and if he really founded any order so named, it was probably at the suggestion of those monks whose influence was often potential from behind the throne. The German Catti were distinguished among the tribes generally, by certain manners, fashions, and vows, which bound them to one another, and laid them under obligation to achieve certain feats of arms. In this respect there is some similarity between the Catti and the chivalry of later times; and to this tribe, thus singular in its customs,—customs which are familiar to us by the descriptions of Tacitus,—may, perhaps, be ascribed the honour of having originated observances which were adopted by chivalry. But chivalry had organizations unknown to this remote and doubtful ancestry, and traces of this organization are not to be found earlier than the period of the Crusades. There were knights, rather than orders of knighthood, indeed, previous to this period; but the machinery of a great company, if we may be allowed such a phrase, was not known till warriors were possessed with a desire to rescue the sepulchre of our Lord from the keeping of the infidel. Nearly a thousand years have elapsed since this desire first agitated society; and the infidel still keeps watch over the Holy Tomb. As far as this object was concerned, therefore, chivalry was only temporarily successful; but, as we have elsewhere hinted, knighthood had other ends in view, besides that which regarded the

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enfranchising of Jerusalem from the slavery in which it was held by the sons of Sarah. The first company was both spiritually and temporally minded. Its object was the extension of Christianity, the destruction of unbelievers, and the protection of those who made pilgrimages to the Holy Land. With the zeal sprang up imposition. A man who had vowed to repair to the East, either as a protector or a pilgrim, received substantial help, if he needed it, from all the religiously-minded who chose, however, to remain at home. One consequence was, that the castle-gate and humble homesteads were infested by idle mendicants, who begged for alms to help them on their pretended way. So general was this imposition, that the name of *saunterer* was given to the greatest idlers of the day—those who lived on the charity which they claimed as pilgrims on their road to the *Sainte Terre*, or Holy Land. The Knights of St John, and also the Templars, originated in a religious feeling of the most praiseworthy kind. Prosperity and superstition ruined both orders, and the sepulchre was once more surrendered to the keeping of the Saracen.

It is after this first "break up" that we find scattered companies of knights in various parts of Europe, who, sword in hand, converted such communities as had not yet merged from heathenism, and who, by right of that sword, took possession of the lands of the people whom they thus converted.

The exclusively temporal orders did not confine themselves, like the exclusively religious knights of St John and of the Temple, to the extension of the Christian faith, and the protection of those who professed it. Their object was to foster valour and all moral virtues, to increase the glory of particular nations, and to maintain unity among certain princely houses. The Knights of the Round Table,—an order which poets have founded for King Arthur in the year 51, are the types of such brotherhoods. Of all such orders known to have existed the statutes are true manuals of morality and *vade mecum*s of those desiring to be virtuous. The object of each founder, whether ghostly or military, seems to have been to have made true Christians, as far as his knowledge lay, of the brethren. If these failed, the fault lay in their not acting up to the instructions of the founder. In no two orders are the statutes precisely the same; they differ respecting elective qualification, condition, and object. Some have been but of small account; companionship in others has been eagerly sought by sovereigns themselves; and mighty rulers of great nations have found pride and satisfaction in suspending the collar of a knight round the neck of their newly-born heir. In most of them, nobility of blood was an essential qualification. This was especially so in the Order of the Holy Ghost. When Catinat became Marshal of France, Louis XIV. announced to him the royal intention of admitting him into the exclusive brotherhood. Catinat was an honest man, but he said he was not half gentleman enough. He was well content to remain disqualified by his birth, for an honour which he had won, if desert only were in question. The makers of pedigrees offered to furnish the modest warrior with hosts of noble ancestors, but Catinat declared that he would not be pressed into greatness by a visionary crowd of noble nonentities. "I would not purchase this very great honour," said Catinat, "at the cost of the smallest lie."

The Order of St Louis was expressly founded, in 1693, for the admission of well-deserving men, who had served the king faithfully for ten years. The order was, however, flung to any who would stoop for it; and so many were willing to do this, that Knights of St Louis were created by hundreds. People remarked of this order, as had been done in reference to that of St Michael, founded and abased by Henry III., that the star of the saint was to be seen upon every ass in the streets. The feeling of contempt for the Order of St Michael is exemplified in the case of the man who purchased the mantle and collar of a deceased knight,

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and therewith decorated his mule. Our own James I. made knighthood almost as common, particularly in the early portion of his reign in England. Indeed, he never then drew his sword unless to dub a knight; and he was for ever laying the weapon, in the way of honour, on individuals more or less willing to endure the infliction.

While some orders have fallen to decay, or altogether disappeared, new companionships have been created, or old ones revived. On some occasions the sovereign of the order has set but an indifferent example of gallantry to his knights. Louis XV., for instance, marred the effect of a grand installation of the Knights of the Holy Ghost, by previously informing the foreign ambassadors that it was not his intention, if they attended the ceremony, to salute them. The ambassadors accordingly absented themselves, and the show lost thereby half its brilliancy.

Roman Catholic sovereigns can found orders without papal sanction, as the German princes could without the imperial consent; but the approval of pope or emperor was considered as giving an additional lustre to the order. Perhaps the most unusual, if not the most irregular circumstance connected with the dignity of knighthood, is the fact of three ladies having, at different times, been created Knights of Malta. The first was the Neapolitan Princess von Rosella, in 1723; the second was a princess of Wurtemberg, twelve years later; and the third was Nelson's Lady Hamilton, knighted by the Czar. In all these cases the honour was conferred with the sanction of the grand master; and gallant deputies, clad in full costume, first dubbed the ladies knights, and then invested them with the insignia of their newly-acquired rank. But many of the ceremonies of this order were inconsistent. After election, a knight was bound to eat his penitence feast, and accordingly he sat down to bread and salt, these being the only things which the order bound itself to provide for him. But this feast concluded, one more substantial and magnificent followed; and at every health the brazen mouths of the artillery boomed forth their loud *hurrah*!

To receive the insignia of knighthood from the hand of a sovereign has been usually deemed the highest honour; but there is one instance at least of an individual preferring to take the dignity from the hand and sword of a less noble person. Frederick, landgrave of Thuringen, in 1338, was at the court of our King Edward, who offered to create him knight. "I will only accept such honour," said Frederick, "at the hands of a man who has never turned away from an enemy." The king promised to sanction the performance of the office by such a deputy, if he could be found; and this was done in the person of one of Frederick's own officers. This rude story, however, seems to us to be rather apocryphal.

We have spoken of the knights being enrolled in various orders; we may add, that there was a class division also. Knights were of two classes, the *Equites Aurati*, who received the honour at the hands of emperors or kings, and whose Latin title was derived from the golden spurs fastened to their heels; and the *Milites*, who were dubbed by other knights of renown, or by ecclesiastics of great dignity. Many a civilian was decorated with the golden spurs, but the *Miles*, who was stricken knight by a knight of great reputation, was more highly honoured. Even kings were proud of such distinction at the hands of their subjects. Francis I. of France was made chevalier by the hand and sword of Bayard; and in England, among other instances, may be mentioned Edward IV., knighted by the Earl of Devonshire; Henry VII. by the Earl of Arundel; and Edward VI. by the Duke of Somerset. The *Miles* made oath that he despised death, and would be the protector of widows and orphans whenever appealed to. It was the *Miles* who figured in the lists in which he sometimes fought without revealing his name, whereby his honour was safe

in case of a defeat. Such a knight was ordinarily of noble blood, or had shown by his deeds that a noble spirit inspired him. He was usually followed by *armiger* and *scutifer*, who looked to his spear, shield, arms, and armour generally, and who stood by him in the fight, to help him in or out of the *mêlée*.

For valuable services rendered, these knights frequently received land from their lord, and this land was held on condition of further service being rendered whenever the holder of it was called upon by the lord. In process of time this method of recompensing past, and purchasing future services, was accounted as being of too costly a nature; and the different orders of knighthood are said by some writers to have arisen partly out of the difficulty of otherwise fitly rewarding military service.

From the earliest times the sovereign, especially, looked for support from such service. Such an one, it is believed, was that incredulous nobleman who disbelieved the prophecy of Elisha, and who was trodden to death at the city-gate, because of his want of faith. He is described as "one of the lords on whose hand the king leaned" (2d Kings, chap. 7). The Hebrew word for this honoured personage is derived from one which signifies "three;" but interpretations vary as to whether the word signified one of those knights, if we may here use the name, who fought in a chariot where there was room for three to fight; or who went into battle with three war horses; or, finally, that he was third in order after the king. However this may be, it was on such a champion that the king is said to have leaned; and, in more recent times, the sword was girt to the side, and the spurs put to the heels of him on whom the king knew he could lean with security of unfailing support. In more recent times, the spurs have been the emblem and stimulus of chivalry. It is therefore singular, that although a knight's spurs were almost invariably first attached to his heels in chapel, church, or cathedral, he could not afterwards wear them within the sacred precincts, except he paid a fine to the choristers. One result of this custom was, that the choristers became less careful of their duty than of looking out for, and demanding money from, all persons who entered the holy edifice wearing spurs. This evil was sought to be remedied by an enactment, or rather a rule, that if the chorister applying for the fine were challenged to say his *gamut*, and failed, the wearer of the spurs should be exempt from all impost. The late Duke of Cumberland once entered the metropolitan cathedral with rowels in his boots. He was immediately beset by the choristers for the usual fine, but he, rather ungenerously and irregularly, evaded the impost by pleading that he certainly had a right to wear spurs in a cathedral, inasmuch as that it was under the roof of such an edifice that they had been first put on. The late Duke of Wellington, on a similar occasion, conducted himself in a way highly characteristic. He entered the chapel-royal booted and spurred. A young chorister approached him, and boldly demanded *spur-money*. The duke immediately challenged the boy to repeat his *gamut*, the boy failed in the attempt, and his grace passed laughingly on, impost-free. A warrior of far less note, the Earl of Cardigan, being similarly accoutred, on entering the chapel-royal, was similarly appealed to by the choristers, but the applicants were unceremoniously thrust aside by the accomplished leader of the lost brigade.

In the old days, the sword played an important part in the creation of a knight. After the candidate for chivalry had confessed, and spent a night in church in prayer and fasting, he appeared before the priest for consecration. During the "office" he placed his sword upon the altar. When the priest had finished reading the gospel, he took the weapon, blessed it, and then, with benison on the warrior, laid the blade on the neck of the knight, who was not, however, accounted a knight complete until he had re-

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ceived the sacrament, and vowed obedience to the faith. In later times, the church ceremony was not a necessary, though still an approved form for the knight to go through. He was a true chevalier if he received the accolade, the sword on the neck, the box on the ear, and the spurs to his heels, from the hand of his prince, or prince's deputy.

If there were knights who kept up the reputation of their country, and their own renown abroad, by the sword, there were some who, in time of peace, employed themselves usefully at home with the pen. The *Livre du Chevalier de la Tour Landry* exhibits to us not a mere literary knight, but one who did for the young ladies of his time what Mrs Chapone did for her young contemporaries at a later period. The book was originally written for the benefit of the good knight's two daughters, and it abounds in maxims, counsels, and illustrative lessons,—the object of all which is the better training of “damosels,” both physically and morally, than had hitherto been their lot. It is singular to find a man from the camp lecturing his fair readers on deportment, seriousness of mind, daily behaviour, and religious feelings. The lecturer is by no means nice of phrase, nor delicate of allusion, in pursuing his theme; and he occasionally puts his conclusions in such antagonism with his premises as may have produced hilarity in many a hall, even in his own days.

The married knights had often good reason for anxiety touching their daughters, and also their wives, during their absence on distant expeditions. They had some resource, however, in the benevolence and gallantry of richer men of their own class. Sir Thomas Berkeley, in the reign of Richard II., left L.100 for the use of poorer knights desirous of proceeding to the Holy Land. Those married knights who repaired thither, or to foreign wars, and who had not castles of their own wherein to leave, or which were not strong enough to protect, their wives, entered into singular agreements with respect to the ladies in question. Thus, in Surtees's *Durham*, mention is made of an indenture in the Treasury there, to the effect that “Sir William Cluxton is minded to go to the wars in France, Sir Thomas Surteys has agreed to receive the Dame Elizabeth, wife of Sir William, into his house of Dinsdale, for the space of one year, to be well and honourably entertained, with her waiting-maid and page (being of decent and sober behaviour), and for this Sir William covenants to pay ten marks.” This indenture is dated “At Sudberge, April 1416;” and there are others of a similar nature extant.

Fulke of Anjou, however indifferently he may have treated his wife while at home, was a rigid disciplinarian of his son, the celebrated Geoffrey. He so subdued this boy's proud spirit, that Geoffrey, after being compelled to carry a heavy saddle many miles, laid it reverently at his father's feet when bidden to do so. Fulke foretold that such un murmuring obedience would make a good knight of him. Nor did Fulke spare himself. When in the Holy Land, he bound two of his servants by oath to do whatever he commanded. In accordance with the oath, they dragged him naked, in sight of the infidels, into the holy sepulchre. There, while one held his neck in a withe, the other scourged him with a rod on his bare back; and the knight cried the while upon God to have mercy upon him, “perfidious and runnigate” as he was.

The law had great regard that a knight should never suffer “let or hindrance.” We find an instance of this in the case of Sir Franco Tyas. Sir Franco had a squire, named William Lepton, and “Will” owed a small sum for mercery, to one German, who being unable to get his money, levied a distress, and seized the squire's horse. The knight immediately brought an action against German, whose seizure of the horse was described as being “ad dedecus et damnum prædicti Franco,” as his squire was thereby prevented from attending on him. Sir Franco recovered

from the unlucky mercer 100s.; and as money was worth twenty times more in the days of the Edwards than it is now, that sum represented L.100 of the coin of current value. Something, too, may have depended on the exact rank of Lepton. The armiger, or spear-bearer always ranked before the scutifer, or shield-bearer.

Some knights, took to horse for other purposes than tilting or crusading. Taylor, the water-poet, has celebrated one of this sort, of the times of Edward II., and also the fate which righteously befell him and his companions.

“Sir Gosselin Denville, with two hundred more,
In friar's weeds, robbed, and were hanged.”

Sir Gosselin and his followers therefore formed a less joyous, but perhaps a not much less respectable company than the troop headed by Sir Roger de Mortimer (cirr. 1280). Sir Roger left London for the grand jousting and tourney at Kenilworth, attended by 100 knights, and as many ladies, who preceded them all along the road, carolling gay ballads as they went.

Despite the courage with which these chivalrous soldiers fronted death, they incurred no reproach by doing their very utmost to avoid it. This was especially the case with the German knights, who thought it not unseemly to wear the *Noth Hemd*, or “shirt of need,” which was supposed to render the wearer proof from all wounds. There was much ceremony used in the making of this garment, on which were embroidered figures of very frightful aspect, worked in by fair hands, with the intention of terrifying any antagonist bold enough to encounter the knight who wore this shirt, or tunic rather, over his armour.

In the encounters which took place between respective knights, the laws of chivalry were not always respected. We read frequently of adversaries assailing each other with “foul” strokes; and the most renowned of these warriors is not free from this charge. Where death ensued, it was sometimes customary to slaughter the dead knight's horse at his master's grave, and fling the carcase in, upon the cavalier's corpse. This ceremony was observed as recently as the last century in Germany; and we have a trace of it in our own country in the steed which is led to the grave's side at the funerals of cavalry soldiers. Among English knights who have sprung from low estate to be at once the flower and mirror of chivalry, Sir Robert Knowles bears a brilliant reputation. In the wars of France, under Edward III., he was so renowned as a destroyer of cities, that the standing fragments of ruined houses were called Knowles's Mitres. Sir John Hawkwood was of as low birth as Knowles; and at first of even lower vocation, for Hawkwood was originally a tailor. He turned soldier, was knighted for his valour by Edward III., became a celebrated “soldier of fortune” in Italy, and is not yet forgotten in the city of Florence. Hawkwood was noted for the readiness with which he extricated himself from apparently insuperable difficulties. This was one of the happiest qualities of a knight, and it distinguished Sir Richard Edgecumbe, who escaped from the pursuers, despatched after him by Richard III., in a manner very closely resembling that by which Rob Roy Macgregor got clear off, after being unbuckled by Ewan of Brigglands.

The ransom of knights was always a criterion of their value. In some cases this seems to have been significantly small. Thus, Queen Elizabeth gave two mastiffs for a noble knight's ransom. The history of Birmingham, too, presents us with a curious incident connected with the subject of ransom-money. When Prince Rupert took vengeance on the republican town which refused to wield a blade for the royalists, he captured many hard-fighting denizens of the place; and these ransomed themselves at a shilling, eightpence, and even twopence a piece. In the great fight at Evesham the Birmingham smiths followed the

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banner of their lord of the manor, and showed by their valour how worthy they were of chivalric honours.

Perhaps knighthood was never more fairly won than when John Copeland captured the gallant King David Bruce at the battle of Neville's Cross. The value of the service was proved by Edward's estimation of it; for he not only knighted the captor of a king, but granted him an annuity of £500 per annum. Commercial men, however, have gained the highly-prized honour for services of a different sort, indeed, but of higher social value. We may cite as an instance, Stephen Brown, the Newcastle grocer, who became Lord Mayor of London in 1438. It was a year in which the horrors of famine were aggravated by the cruel covetousness of the forestallers. The mayor privately despatched ships to Dantzic, which returned so heavily laden with rye, that the price of grain fell immediately, and the famishing people were fed at a reasonable rate. Fuller says of this knight that "he was one of the first merchants who, in want of corn, showed the Londoners the way to the Barn-door, I mean into Spruce-land." The very name of Brown, however, would have been considered a disgrace to chivalry by Spanish knights, who had a decent horror of monosyllables. Thus, when the plague prevailed in London, in the reign of Elizabeth, the Queen placed the Spanish ambassador under the hospitable guardianship of Sir John Cutts. The ambassador was rejoiced to profit by the refuge afforded him in the mansion of a bountiful housekeeper, but he expressed his disgust at being lodged with a knight with a monosyllabic surname! The custom of conferring the honours of chivalry on men of low degree was not confined to England. Pittscottie informs us that the Earl of Mar, who owed his title and spurs to James III. of Scotland, was originally a mason; but Cochrane, the name of the individual thus ennobled, seems to have been, at least, an architect. If James III. gave signal honour to the arts in the person of Cochrane, Henry VIII. as much distinguished science, in its legal view, by raising a sergeant-at-law to the dignity of chivalry. A curious result followed. All the sergeants took a corporate view of the matter, and declared that the entire learned brotherhood had been elevated by the honour conferred upon one member of it. Accordingly, since the period in question, the learned sergeants have claimed equality of rank with knights-bachelors, and they decline to "go below" them.

Although the monarchs of Great Britain and Ireland have frequently rewarded great desert, so far as it can be poorly rewarded by the now barren, yet not unenviable, distinction of chivalry, the rule by which such recompense is regulated is incredibly absurd. We do not speak now of that more simple "knighting" which tacks "Sir" to a sheriff's name for carrying to court a congratulatory address. We allude to the coveted distinction of the civil K.C.B. A man may be an unparalleled benefactor to his country, but unless he be in the government service, in some way bearing the Queen's commission, he cannot possibly be a Knight Companion of the Bath. It is an error to suppose that the "civil" dignity is open to the meritorious generally. If the aspirant, however deserving, be not in the actual service of the government, he may be "knighted," but he cannot be a K.C.B. The injustice of this rule is equalled only by its absurdity. Almost as absurd is the latest incident that has been put on record with respect to chivalric decorations. The Emperor of the French conferred on several British subjects, who had distinguished themselves in the great competition at the Paris Universal Exhibition, the Order of the Legion of Honour. No foreign order can be worn by an English subject, but with the sanction of the sovereign, and in this case the sanction has been withheld. Thus, we neither distinguish our really great men at home, nor allow them to be distinguished abroad. Queen Anne once thought of an order of Minerva

for the reward of great literary merit. The symbol was to be a silver owl, and therewith the matter was laughed at and forgotten. Let us hope that under Queen Victoria we may have an order of merit for knights of a more useful character than those of old, whose merits, however, were properly recognised in rewarding service most useful in its day.

At a not very remote period it was customary to address the clergy by the knightly title of "Sir." This title was, however, originally employed to distinguish the Bachelor of Arts, who was called "Dominus," from the Master of Arts, whose proper appellation was "Magister." For a long time, however, the chivalrous prefix was conferred on all the clergy indifferently; and "Sir" equally distinguished knight and cleric. It was used, however, not as in chivalry, with the Christian name of the dignified person, but with his surname.

This custom existed throughout England, and it was observed also in the Isle of Man, but with some exceptional clauses. Thus, in the ancient island, the prefix of the knightly title of "Sir" was only allowed to native ministers, "unless," says an old history of the island, "they be parsons of the parishes, which are but few (most of the parsonages being impropriated to the Lord of the Isle or the Bishop), as thus, Sir Thomas Parr, minister of Kirk Malow. But if they have the title of parson, then they are only called Mr, as Mr Robert Parr, parson of St Mary of Bellaugh."

The word "Sir," as we have previously observed, stood for Dominus, Sieur, Sire, or Seigneur. Richard II., in his Act of Abdication, is styled "Mon Sire Richard." The monosyllable which adorns knighthood is said to have a very remote origin, and a very extensive circulation in all countries and languages. It is found in the Hebrew, "Sar," lord or prince, and "Sarah," a noble lady. In the Egyptian "Serapis," we have the Lord Apis; and it has been even suggested that the Saracens are not so called because of any connection with "Sarah," but as "Ser-agarenorum," lords of flocks; and, finally, as the Muscovites refuse to trace the word Czar to Cæsar, some etymologists are inclined to believe that the former word is only a form of the knightly "Sir," or lord. But we leave the consideration of this matter to the etymologists. Whatever may be the origin of the word, few who bore the title conducted themselves ill in the field or at the tournament. On occasions of very serious encounters, either in the battle or the lists, great attention was paid to the condition of the armour. This was considered of such great importance that, as painters of old used to mix their own colours, so knights of old were wont to forge their own armour. When the Duke of Burgundy was about to meet in mortal combat the great Duke Humphrey, the former lit his armourer's furnaces within his Castle of Hesdin, and forged with his own ducal hands every plate of the defences behind which he hoped to get through the encounter, if not unstained, at least as nearly unscathed as might be.

We will now proceed to briefly notice the history of the principal orders of knighthood, whose names are familiar to us, and the deeds of many of whose members have been subjects for the historian, the poet, and, when he would question the uses of chivalry, the philosopher, and statesman also.

Charity may be said to have been the foundress of the Knights of St John of Jerusalem, A.D. 1043. The sufferings of poor and wounded crusaders touched some kind hearts; a hospital was raised, and the male nurses of the patients became the Knights of St John. They were at first mere "Hospitallers Brothers of St John the Baptist of Jerusalem," were incorporated by the Pope, wore the habit of St Augustine, and were bound accordingly to poverty, chastity, and obedience. They had to make fre-

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quent journeys, and they had need of arms for self-defence. They were permitted to carry weapons, and gradually they grew into a great military order, bound to smite the infidel wherever encountered, and to defend the Holy Sepulchre and its cause. Candidates for admission presented themselves from all countries; and rich donations reached them from all Christian kingdoms. Ultimately, they were classed into seven languages or divisions. Three belonged to France, under the titles of France, Provence, and Auvergne. The other languages were Italy, Germany, Arragon, and England. The last was abolished at the Reformation, and replaced by what was called the Anglo-Bavarian.

The seven classes were subdivided into three divisions,—1st, The knights of justice, the governing body, of which every man was noble, from which the grand-master was elected, and whose members shared the lion's portion among them. 2d, The priests of the order, with the Bishop of Malta and the prior of the conventual church of St John at their head. There were true samples of a "working clergy" in this class, particularly in the chaplains on board the knights' galleys. 3d, The *servans d'armes*, the fighting squires who followed the knights in all expeditions, and did the work of active troopers. They were required to be "respectable," and none were admitted who had ever demeaned himself by engaging in trade, or even exercising any art. A worthless fellow of legitimate [respectable] birth might put on armour and serve in this class, but Pythagoras himself would have been black-balled had he been a candidate for admission. All classes voted at the election of grand-master.

Originally, the knights of the first class were not exclusively noble, but when the plebeians threatened, by continual increase, to outnumber the aristocrats, the latter looked to their interests in time, and so arranged, that not only was the admission of a candidate of low degree impossible, but none could enter who failed to prove a nobility of many centuries' standing.

When the order, after passing from the Holy Land to Rhodes, ultimately settled in Malta, many alterations took place. A knight was not required to ride before he was of age; but during his novitiate it was necessary that he should serve in three or four *caravans*, or naval expeditions, against the infidels. Among the celebrated men who so served, were the two Counts Königsmark. The younger of whom will ever be remembered in connection with the story of Sophia Dorothea, the consort of George I. The knights of whom we have briefly treated held their own in Malta till 1798, when Bonaparte extinguished them; but they still shiver on in a refuge said to have been granted them in Russia, where they are neither ornamental to the Muscovite system nor useful to mankind.

The Templars, or Knights-Templars, were distinguished for being at once a military and a spiritual body, which took its rise at Jerusalem about the year 1118. Nine Christian knights there resident devoted themselves to the service of God, as *Cononici Regulares*; and to the three ordinary vows of chivalry they added a fourth—namely, that they would protect all pilgrims on their way to the Holy City. King Baldwin assigned them a house near the "Temple of Solomon," from which they took the name of Templars; and the poverty of an order which existed on the alms of the compassionate was illustrated in the device which showed two knights riding on one horse. They soon became renowned for their intrepidity, an excellence which was sharpened all the more by the fact, that if a Templar allowed himself to be taken, his order would offer no ransom-money to the avaricious infidel, nor would purchase his freedom by anything more costly than the gift of a sword or dagger. The great St Bernard is said to have been the author of the statutes framed at Troyes, in Champagne, in 1128, for the regulation of the order. Ten years later, Pope Eu-

genius III. gave the knights permission to wear the red cross on their white cloaks.

From this period they began to increase in wealth and numbers. Even kings enrolled themselves in their company; and in every powerful nation in Europe, there were numerous "commanderies," enjoying more ample revenues than the crown itself. The increase in their wealth is proved by their purchase of the island of Cyprus from Richard I. for the sum of 35,000 silver marks. But with wealth they acquired a taste for luxury; thence came many vices, and one of them, which is generally the source of several that are worse, was alluded to in the popular proverb, "he tipples like a Templar." They became oppressors rather than protectors, especially in the Holy Land, renounced obedience to the Patriarch of Jerusalem, and waged war even against Christian sovereigns. They were the opponents rather than the allies of Frederick II., in the celebrated crusade of which that German monarch was the head, and the partial failure of which was among the least of the treacheries of the Templars. At length, for the greater crimes of a few, the whole order in France fell a sacrifice to the vengeance, hatred, and, it may safely be added, the cupidity of Philip the Fair. It was to France that the majority of the knights repaired after the loss of the Holy Land; and Philip had little difficulty in capturing the whole on one and the same day. His hatred against them was of long standing. When King Louis besieged Damascus, the Templars were under his banner, but just as the assault was about to be made, they placed themselves between the Christian army and the besieged infidels. With the latter they negotiated, offering to secure good terms for them on condition that they should deliver to the knights three basketsful of money. The Templars compelled Louis to agree to the conditions which the order proposed, and when they were signed, the cunning Damascenes sent to the knights the number of baskets agreed upon, full to the brim of copper money.

On whatever amount of truth this tradition may rest, it is certain that Philip strove energetically to obtain the approval of Rome and the French University respecting the step he had taken in seizing upon the persons and property of the Templars. But the church and the schools desired the jurisdiction of a temporal governor over a spiritual body; and Pope Clement V. sent ecclesiastical commissioners into France to watch over the possessions and bodies of the religious cavaliers. In the hands of these commissioners Philip placed several of the knights, and these, on being taken into the presence of the Pope, at Poitiers, accused themselves and the order of crimes at which the most hardened nature shudders, and of absurdities at which the dullest nature must laugh. Moved by this confession, or pretended confession, Clement surrendered the order to the mercy or vengeance of Philip, providing, however, that the wealth of the knights should be devoted to the furtherance of the Christian cause in the Holy Land. The Templars, despite some traitors among them, made a noble stand against their enemies, but they were fore-doomed as well as pre-judged, and ultimately the order was annihilated, by the delivery of the members to continual captivity or to a cruel death, and the king and the Pope divided the wealth of the order between them.

The military knights of Prussia, those against whom the Teutonic Polish astronomer Copernicus so successfully contended, not by force of arms, indeed, but of argument and truth, were probably a far less innocent society than the Templars. The Teutonic Knights not only knew how to acquire wealth, but also how to retain it.

Among the religious orders, that of the Teutonic Knights is assuredly not the least famous, nor was it the least influential. The order arose out of the misery which reigned

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among the besiegers at the celebrated siege of Acre, at the close of the twelfth century. The sufferings of the Christian soldiers excited the compassion of certain German merchants. These erected tent-hospitals, and rendered other services to the unhappy warriors of such value that the German princes enrolled the princely merchants in an order of knighthood, named the Teutonic Knights of St Mary of Jerusalem. This order had the especial sanction and patronage of Pope Celestine III. None could be admitted into it but men of noble birth; and, probably, the merchants who were the original members of the order were ennobled before they were enrolled. Their equestrian garment was a white mantle with a black cross, and this, with bread and water, constituted all the reward sought for by men who vowed to remain pure in body and mind, poor in purse, and to carry succour to Christians wherever it was most needed. The vow, however, was strangely construed in succeeding years. At the opening of the thirteenth century the order was powerful and rich, and carried on a bloody war in defence of the infant church of Prussia, under the sanction of the Pope and crusade-preaching saints. The order, after withdrawing from Palestine, conquered Prussia, Livonia, Courland, and other territories, which they swept of their pagan proprietors by means of fire and sword. Innocent III. was especially fierce against the Livonian pagans; and the Teutonic Knights who carried out his terrible behests gained glory or martyrdom by slaying or being slain.

It must be acknowledged that the Lithuanian heathens were not excessively tender-hearted. When they caught a knight, they immolated him in a fashion of barbaric splendour and stupendous cruelty. Voight describes one of these executions, on the person of the knight Margerard Von Raschan. The latter had been captured when bleeding from a score of wounds. His captors bound him upright on his horse, and burnt both alive—knight and steed.

Pious princes, and gentlemen of the sword who desired to see service, flocked to the banner of the order from all European nations. Our Henry IV., when only Earl of Derby, went over to Dantzic in 1390, with three hundred followers, and fought in the ranks of these formidable chevaliers.

The knights and their paid men-at-arms became in time nearly as cruel as, and far more wealthy than, the pagans whom they had destroyed, plundered, or converted. Pope after pope exhorted them to remember their vows, but all in vain. They chose rather to increase their possessions than defend the faithful. In some respects they may be said to have done both. But they became absolute masters of Prussia especially, their administration of which was of mingled good and evil—mercilessness and humanity. Their great apologist, Voight, insists upon eulogizing their spirit of toleration, which appears to have consisted in only slaying those of the enemy who could not be convinced that the new religion was superior to the old.

The romances abound in illustrations of the view in which these chevaliers looked upon the principle of honour. But reality is not less prolific of instances than romance. We will name one.

Prussia was infested by a band of gentlemen bandits, under the command of a squire named Arnold. No less desirable a prisoner than the Duke of Gueldres fell into their hands. To rescue so noble a cavalier, the Grand Master of the Teutonic order, with an overwhelming force, set out to storm the stronghold of the adventurers. Arnold did not await his coming. He first, however, visited his prisoner, made him acquainted with the condition of things, informed him whither he was about to retreat, and, bidding him tarry in the castle if he preferred doing so, took from him his promise to surrender at a certain time or place,

or send his ransom. The duke was rescued, but no entreaties nor representations could induce him to remain at large, after he knew that Arnold had again a roof over his head. He then surrendered himself, and remained a prisoner until his friends ransomed him. This illustration, however, is somewhat unsatisfactory; for if a knight, by breaking a promise, was dishonoured, how was it that so chivalric a body as the Teutonic order repeatedly and earnestly urged the duke to break the faith which he had pledged to Arnold?

Of more recently created orders, those of the Golden Fleece and the Garter may be said to have been the most famous, as they have also been the most enduring. The French orders of St Louis and the Holy Ghost threatened to eclipse all other confraternities, but these orders, without having been suppressed, have ceased to exist. The insignia may occasionally be seen on the breast of some ancient "legitimist" of illustrious birth, but since the fall of the Bourbons no new members have been officially created. At Frohsdorf, perhaps,—where the so-called Henri V. "bides his time,"—a faithful servant may occasionally be authorized to wear the august symbols, as they are worn by their exiled master; but these are not knights acknowledged by France; and their creation is not counter to our assertion, that the orders may be said rather to have ceased to exist than to have been officially suppressed.

Of the other two confraternities named, we will give precedence to that of the Golden Fleece. This brotherhood was renowned for its courtesy, and it may be fittingly treated with as much of that commodity here as we can show it, by giving it precedence in our pages.

The Golden Fleece (*Aureum Vellus; Toison d'Or*) has a classical origin. When Athamas of Thebes, in obedience to the oracle, was about to sacrifice his son Phryxus and his daughter Helle, they were rescued by their defunct mother Nephele, who had been metamorphosed into a cloud, and who gave to her children a ram with a golden fleece, on which they were to cross the seas, and find safety in Asia. Helle fell off by the way, and gave her name to the sea in which she perished—the Hellespont. Phryxus, more fortunate, crossed the Black Sea in safety, and landed at Colchis, a part of what is now called Mingrelia. There he slew the ram, and hung up the fleece, a thank-offering, in the Temple of Mars. The golden wool became an object of universal cupidity; but it was watched by a fiery dragon, whose vigilance was not overcome till the Thessalian Jason came, armed with cunning, and carried off the prize to Greece. In such wise have the poets sung of what is supposed by more matter-of-fact persons to have been a matter of gold-yielding mines in Colchis, and of the sheepskin "cradles" in which the lucky finders washed the auriferous earth.

When Philip the Good, Duke of Burgundy, was about to marry Isabella of Portugal, in 1430, he resolved to celebrate the auspicious event by founding an order under the patronage of St Andrew. He had a pious desire to further the extension of the Church and the Christian religion in the East, and particularly in the Mingrelian region, where the Golden Fleece had once hung, and St Andrew, according to tradition, had preached. But the Duke's fleece was to carry the Northern Church and the Romish religion more safely than the ram had borne Phryxus and Helle. This is the most reasonable of the many origins given to the renowned order. We are bound, however, to add, that it has been the most laughed at. Old Favina ridiculed it; and laborious Zedler, while he ridicules ancient Favina, agrees with him in ridiculing the account of the origin of the name and object of the order. Favina thinks that the Fleece of the valiant Grecian was in the mind of the valiant Duke when he founded the grand order of chivalry. Other

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explanations are not lacking. Thus, Philip loved a damsel of low degree, who was so little addicted to luxuries that she covered her toilet-table with a fleece, and the sight set laughing a whole bevy of courtiers who once followed the Duke into her room. Philip swore an oath that he would make every noble in Christendom proud to wear this fleece, which he made the sign of an order founded in honour of this "light o' love" lady. Some old chroniclers denounce this as a disgraceful story, and tell a worse, touching a lady still less scrupulous than the last, and whom Philip celebrated because of her infidelity. Others, again, come back to the Colchian theory, by asserting that the Duke took the vow of knighthood on a pheasant, a bird which originally came from the banks of the River Phasis, in the vicinity of Colchis. After all, there is a forgotten, but a common-sense and an ingenious origin ascribed to this order, and which may serve also to show how it came to be mentioned in connection with Jason and the Golden Fleece. In July 1430, such a harvest was reaped throughout Flanders, and the prospects of the remainder of the year were rendered so secure thereby, that the Duke, out of pure gratitude, constituted the knightly brotherhood; and as he perceived that the word JASON contained the initials of the names of the five months to come, July, August, September, October, and November, he was reminded of the fleece, and took it for a symbol. This is too ingenious a story to be omitted in an account of the origin of the order.

The object of the founder was expressed in an inscription on his coffin:—

*"Pour maintenir l'église, qui est de Dieu Maison,
J'ay mis sus le noble ordre qu'on nomme la Toison."*

Philip fixed the number of knights at thirty—all noble, and without reproach. They were bound by statutes, laid down at considerable length, and ninety-four in number. The knights were required to be without blemish; but this did not apply physically, for among the thirty original knights we find Baldwin de Launoy, Lord of Molembair, surnamed "the Stammerer." On the occasion of the first chapter Philip created only two dozen knights; and we may notice among them John de Villiers, the ancestor of the English plenipotentiary (Lord Clarendon) at the late peace conferences of Paris. To this descendant of the old De Villiers the Emperor of the French offered the grand cross of a chevalier of the Legion of Honour, which was respectfully declined, on the ground of its being unusual—perhaps illegal—for English ministers to receive orders of knighthood from foreign sovereigns. It was not till the accession of Duke Charles that an English king was invested with the insignia of the order, in the person of Edward IV., who was created Knight of the Golden Fleece at the chapter held in Bruges in the year 1467. At the death of Charles, the Netherlands fell into the possession of Maximilian of Austria, the husband of Charles's only child. The order passed to the Spanish crown with that portion of the Flemish inheritance of Charles V., Emperor of Germany, which was made over to his second son Philip, King of Spain; and the Fleece of Jason and of Burgundy is now stabled in the Spanish capital.

Of English orders, the most highly prized, if not the most illustrious, is that of the Garter, which we now proceed to notice.

Order of
the Garter.

The Order of the Garter has a properly chivalrous foundation. It springs from a double gallantry—from arms as well as love. In the days of the Crusades, when Richard Cœur de Lion was our King, there was a body of noble fighting men in the Holy Land, who were distinguished by a blue leathern thong, worn round the left knee. The symbol was not that of a recognised order, but the wearers of it were doubtless "brothers in arms" after the strictest

manner, and were probably therewith the personal friends or companions of the king.

*"Round Ormond's knee thou ty'st the mystic String,
That makes the Knight Companion to the King."*

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In 1343 the symbol of the thong was converted into the garter by Edward III. That monarch, having heard of the surpassing beauty of the Countess of Salisbury, celebrated a tournament in her honour at Windsor. The lady accompanied her lord to this rough festival reluctantly, and in very simple attire. All around her was a blaze of gold, jewellery, and beauty: she alone shone with the last only, and therein excelled all other ladies present. The king was, to use an old phrase, "stricken" with her charms, and he seems to have paid her that audacious homage which princes then could pay with impunity. But the Countess of Salisbury was as honest as she was fair, and had no intention, as Froissart remarks, to obey the king "in anything evil that might tend to the dishonour of her dear lord." The king persecuted the noble countess with his suit, whereby he outraged some of the strictest rules of chivalry. Divested of its romantic features, the narrative of the foundation of the garter would seemingly resolve itself to this—that the feast given by the king, who had great curiosity to see this lady, was annually repeated in honour of her, or in memory of her womanly virtues. Froissart calls the feast to which Edward originally invited the countess a "convocation of the order." Some organization, therefore, existed previous to the appearance of the lady at Windsor. The first regular chapter, however, was not held till St George's day, in the year 1344. At this first chapter Queen Philippa was present, wearing the robes of the order. Some authors, however, describe the chapter of 1349 as the first regular chapter of the order.

The presence of the knights at the feasts held on the anniversary of the day of their patron, Saint George, was very strictly enforced. If a knight allowed two festivals to pass without being present he was fined in a jewel, which he deposited on the altar in the chapel. For every succeeding year's absence the knight who so offended paid the forfeiture of two jewels. It was imperative on every knight to wear the garter in public, and on all occasions. He was equally strictly bound to wear the "sanguine mantle" from the eve of, to the morrow after St George's day. Though a knight was mulcted in a jewel for being absent from the annual feast, he had only to pay a silver penny for not being present at prayers, in St George's Chapel, whenever he was in the vicinity of Windsor. His own soul was otherwise well cared for; and whenever a member of the order died, the surviving members subscribed their gold pieces for a certain number of masses for his rescue from purgatory. It was the privilege, too, of any knight who incurred the penalty of death, to die only by decapitation. The rules of the order also enjoined especial forms of degradation for any member who should be guilty of cowardice. Such a crime was held to be almost impossible; at least as long as the heart of St George stood in its golden shrine above the altar of the chapel. This relic was brought to England by the Emperor Sigismund. St Ambrose tells us that when St George was dying, he bequeathed his trunk to the infidel—counting upon their conversion, in consequence. His heart he left as a legacy to the Christians. He must have had a prophetic vision, indeed, if it be true, as Anstis tells us, that the saint bequeathed his heart, not to Christians generally, "but to Englishmen alone; and not to every part of England, but only to his own Windsor; which, on this account, must have been more pleasing to the sovereigns and all other the knights of this most illustrious order." The Emperor Sigismund brought to England, not only this treasure, ac-

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counted so precious, but a portion of the skull of the saint also. He presented the same to the invincible Henry V.; and, till the time of the Reformation, the relic was an object of great veneration on the part of the Knights of the Garter, who had a particular reverence for their great patron, St George.

The rules and constitution of the order form a document of very great length: but there is nothing new in them touching the qualifications for chivalry. Piety, charity, truth, fidelity to Heaven and the fair, is the sum of all. It was, moreover, distinctly laid down that no person could be elected unless he were without reproach; but this rigid rule has been more frequently infringed than any other. In the wars of the Roses, knights were made or unmade with very little ceremony. If the chapter was full, the triumphant faction beheaded a few of the antagonistic party, in order to create vacancies for the conquerors. Not that there was always great desire to reach the honours of companionship. There are frequent instances of foreign sovereigns declining to accept the honour offered to them. Some hesitated, fearing that the fees might be heavier than they cared to pay. Occasionally we meet with princes who have accepted the dignity, but who forfeit it, because they neglect to appear, within a prescribed time, to take possession of their stalls.

The installation almost invariably took place at Windsor, but it was not there that the chapters were always held. A century after the order was founded, we hear of a grave king, Henry VI., holding a chapter in a very gay locality, —the Lion Inn at Brentford. In this jovial resort were elected two knights, Sir Thomas Hastings and Sir Alonzo D'Almade, on whom the king conferred a handsome gold cup. This hostelry was not the last place of its sort in which companionship in a first order of knighthood has been conferred. When Louis XVIII. was in London, on his way to his recently recovered throne in France, he was visited at Grillon's Hotel, Albemarle Street, by the Prince Regent. The French monarch improvised on the instant a chapter of the Holy Ghost—and taking the insignia from his own neck, he placed them round that of the prince, with the remark—"Of all I once possessed this alone is left to me; and I give it willingly to the most generous of princes." The new chevalier of the Holy Ghost returned the compliment, the same evening, by buckling round the knee of Louis the jewelled garter. "I am the first King of France who has worn this decoration since the days of Henry IV." His Majesty, in thus speaking, was not strictly correct, for Louis XIV. had worn the order. But the Grand Monarque received it from the hands of the uncrowned James II., at St Germain's; and the "late King James," as the English journals used to call him from the time of his dethronement, was held as having no right to confer an honour which could spring only from the reigning sovereign of England.

With regard to insignia, it may be noticed here that the "George" and "collar" were added to the garter in the time of Henry VII. So particular was this king in observing the rules of the order, and so earnest in his veneration of the patron saint, that, to encourage the royal knight, the Cardinal of Rouen presented him with a portion of a leg bone of St George. The bone was solemnly exhibited at one of those gorgeous chapters which Henry loved to hold in cathedrals;—the chapter in question was held in the old metropolitan church of St Paul. The monarch was so gratified with the cardinal's gift that he erected, at his own expense, a solid silver image of St George on the altar of his chapel at Windsor, and ordered that it should remain and receive homage there, "at all solemn feasts,"—"while the world shall endure."

That general remodeller of many things, Henry VIII., entirely recast the statutes of the "noble order." It

was found that the rules which bound the men of one time could not be rendered obligatory on the men of a later period. One of the new rules may have been useful when made; at all events, it deserves to be recorded. Originally it was not necessary that an individual should be a peer in order to gain admission into the order. Merit of some sort, the more distinguished the better, was the first qualification. In Henry's time there were several members of the order who were below the rank of peers. To these, indiscriminately, he granted permission to wear dresses made of woollen cloth manufactured in foreign countries. This was a movement in the direction of free trade; but the benefit of it was confined solely to the knights and peers: the common people were compelled to deck themselves, as before, in home-made productions. It is from Henry's time that date the regulations whereby men of high merit, yet of inferior social degree, are debarred from companionship. The king, very characteristically, broke his own rule, by giving the garter to Thomas Cromwell. In the reign of Edward VI., under whom much of the religious ceremony at installations was abolished, Lord Paget was ejected from the order on the ground of original lack of noble blood; but he was reinstated by Mary. There was, certainly, no lack of noble spirit under this queen. In proof of this may be cited an incident which followed the reception of her husband Philip in the order. The obsequious heralds, in honour of the occasion, were proceeding to take down the arms of England, in the chapel, and to substitute the shield of Spain; but some stout old English lords opposed the attempt, and with such vigour, that it was not persevered in. It was a rule of the order, that if a member plotted or rebelled against the sovereign, he thereby incurred forfeiture of his knightly degree, as far as it was connected with the order of the garter. It is very remarkable, however, that even after Philip had despatched the Armada against this country, he was not deprived of the garter, nor was his banner taken down. The conduct of Elizabeth, with regard to the two great enemies of the Protestant faith was remarkable. She retained Philip on the roll of knights, and she sent the garter to Charles IX. It is strange, fond as this queen was of magnificent displays, that she was the first sovereign of the order who discouraged the anniversary banquets. Her treatment of the newly-elected knights was also characteristic of the woman. Their election was not reckoned valid till it had received her sanction; and this she frequently withheld to the latest moment, finding pleasure in keeping the candidate for a highly-coveted honour in painful suspense.

Down to the reign of James I., the "ride" of a knight to Windsor, to be installed, was among the most magnificent, as well as popular spectacles of the period. The outlay for "bravery," as the incidental finery was called, was often enormous. James forbade much of it, under peril of a pecuniary mulct. He prohibited the giving of "livery coats, for saving charge, and avoiding emulation." This prohibition, however, he turned in some degree to his own profit, for his Majesty ordained, as an improvement on the old custom, that all companions, at their installation, should present a piece of plate, of the value of £20 at least, "for the use of the altar in St George's Chapel," and, of course, for the adornment of the royal banqueting-room in the castle. The sumptuary law of James would seem to have been inoperative; for never were there more splendid cavalcades of knights from London to Windsor than in the early period of the reign of Charles; but, also, never were there more dismal chapters held (sometimes only three or four knights obeying a sovereign summons) than when the times became agitated through the obstinacy of the king and the resolution of the popular party and their leaders. The "George" of this sovereign displayed his gallantry; for it bore, on the under side, the portrait of his wife, Henrietta

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Maria. This famous jewel, cut in an onyx, and surrounded by twenty-one table diamonds, in guise of a garter, was worn, subsequently, by the worthless Lauzun, and is now in the possession of the Duke of Wellington, who inherits it from the late duke. Cromwell did not touch the garter, but he dubbed half-a-score knights; and "Oliver's Knights" were unjustly made the buffoons of the stage, long after the Restoration. Charles II. did not wait for that Restoration before he created Knights of the Garter. He made several during his period of exile; and the first two on whom he conferred the dignity, on recovering "his own again," had well earned the distinction,—they were Monk and Montague; and they were among the last who received the garter before they had been raised to the dignity of the peerage. James II. would have restored the ancient religious ceremonial if he had had time. On the other hand, under the grave William, the custom by which a knight was expected to celebrate his newly-gained dignity by a splendid banquet was renewed. In the newspapers of this period frequent mention is made of these feasts. As a sample, may be noticed the installation-banquet of Lord Portland, in March 1697. It is described as being of extreme splendour, and the fare was, certainly, equally abundant. The friends of Bentinck sat down with him to "three oxen, eighteen calves, twenty-five sheep, and a vast quantity of fowl." The journalist, however, has forgotten to inform his readers of the number of the guests. While Anne and George I. were creating Knights of the Garter at home, the Stuart king did not fail to exercise the same right at St Germain's, or wherever the court happened to be, for the time. It is said that George II. changed the colour of the riband, from dark to light, or garter-blue, in order to distinguish the genuine Knights of the Garter from those created by the Pretender, who retained the original colour. Under this same king, not only were the splendid banquets revived, but the popular curiosity concerning them seems to have been of a very exciting character. Thus, in 1752, on the anniversary of the birthday of the young prince, who was afterwards George III., there was an installation of knights at Windsor, followed by a dinner and ball. In connection with the banquet, Sylvanus Urban tells us that "the populace attempted several times to force their way into the hall, where the knights were at dinner, against the guards; on which some were cut and wounded, and the guards fired several times on them, with powder, to deter them, but without effect, till they had orders to load with ball, which made them desist."

Under George III. there were more irregular elections in the order than under any other king. Junius detected and exposed the illegality of the election of Earl Gower; and George III. abolished the statute of Edward, confining the number of companions to twenty-five, in order that he might admit all his sons. This bad example authorized George IV. to infringe the statute still more, by admitting foreign sovereigns to companionship, without any regard to the regulation by statute. The royal founder would now hardly recognise his own order, so different are, in many respects, its rules from those by which it was governed in the early days of its grandeur. Changes of manners, mutability of human fashion, and necessary modifications of religious ceremonials, authorize, in a very great degree, the statutes which are now in force. Many of the old ones, indeed, could not in these days be acted upon. No knight would accept the honour, on condition of always wearing the habit; and it would hardly be edifying to observe the whole chapter on their knees, as in the days of Henry V., before the supposed heart, and fragments of the skull and leg bone, of St George of Cappadocia.

In connection with the sovereign of the Order of the Garter we may notice, that after George, Prince Regent, had bound the Garter round the knee of Louis XVIII., he

expressed his own sense of the absurdity of English kings retaining among their titles that of "King of France." From the accession, therefore, of George IV. this title was dropped, and there disappeared from the coronation ceremonial those two knights who were, for the nonce, converted into dukes of Aquitaine and Normandy, and who were supposed to have repaired to the foot of the throne of the new king, in order to do homage for those provinces. Churchill alludes to this folly in his "Ghost," when he speaks of peers

" 'Who walk,' nobility forgot,
With shoulders fitter for a knot
Than robes of honour. For whose sake
Heralds, in form were forc'd to make,—
To make, because they could not find,
Great predecessors to their mind.
Could she ('Satire') not (though 'tis doubtful since,
Whether he plumber is, or prince),
Tell of a simple knight's advance
To be a doughty peer of France?
Tell how he did a dukedom gain,
And Robinson was Aquitaine."

The Order of the Bath has its peculiarly legendary tradition, which must be noticed, although it need not, necessarily, be credited. Henry IV., it is said, was surprised in his bath by two widows who had a feud, and who requested him to pronounce judgment between them. From these litigants the modest monarch made his escape by springing from the bath, and he founded the order in memory of the circumstance. It was the rule of all knighthood that the candidate for chivalry should bathe the night previous to the celebration of the solemnity at which he was to be created a knight. The order, which took its name peculiarly from an observance which was common to all orders, was founded at the close of the fourteenth century. The shield of the order bore three golden crowns in a field azure, with the inscription, *Tria in unum*. One of the most brilliant assemblies of the order was at the coronation of Charles II.; and in former times a Knight of the Bath was seldom created save at extraordinary seasons, such as the birth of an heir apparent, a royal marriage, or a coronation. The Order of the Bath, which some writers describe as a simple order of Knights Bachelors, fell into disuse. It was revived, however, in 1725, in the reign of George I., when the Duke of Montague is spoken of under the title of "Grand Master." When Walpole re-established this companionship, for the sake partly of rewarding or of purchasing political service, a few persons affected to make light of the honour, but when the minister declared that the Bath was a necessary preliminary to the Garter, the former rose in estimation, and the insignia became objects of a laudable ambition.

The old constitution of the Order of the Bath remained in force until the period immediately following the battle of Waterloo, when the Bath was divided into three classes, for the purpose of rewarding the various claimants of distinction. These are the Grand Cross, Knights Commanders, and Knights Companions. The first two rank above ordinary Knights Bachelors.

Ireland had no order of knighthood till the year 1783, when that of St Patrick was instituted by George III. In 1815, George IV. established the Guelphic order of Hanover. The decoration was at first conferred almost exclusively on Englishmen, but the Guelphic order having gone with the kingdom of Hanover, apart from England, the star is now seldom seen but on continental members.

The ancient Order of the Thistle dates at least from the times of Robert II., whose coins bore the cross and impress of St Andrew. The badge of the Thistle, however, was not worn before the reign of James III. It was said that these emblems were not connected with any distinct order of knighthood previous to the reign of James V.

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Order of St
Patrick.

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Subsequently this chivalric companionship was suppressed by the Reformers, and it was not till the reign of James VII. (II. of England) that the thistle and chivalry again bloomed together. The order is accessible to peers only. "A commoner," says a recent writer, "may have conferred more honour and service on his country than all the Scottish peers put together, but no amount of merit could procure him admission into the Order of the Thistle." Nevertheless, three commoners did once belong to it; but their peculiar merit was that they were heirs-presumptive to dukedoms.

Order of
the Gennet.

The first order of chivalry known in France was that of the *Gennet*, a species of *fouine*, or "wood-martin," once well-known and valued for its beautiful fur. When Charles of Aquitaine had defeated the Moors at Tours, in the year 726, he found in the camp which the invaders left behind them a large number, alive and dead, of those once valued, but now almost forgotten animals. In memory of the battle which he gained by the aid of "St Martin of the war," he built a church to the Saint, and founded the order of the *Gennet*, or "Wood-Martin," in his honour. The founder received, in return, the designation of the *Martel*, or "Hammer of the Saracens." The order consisted of sixteen knights, and it was held in high regard by the Carolingian kings, but became extinct after the accession of the Capetian race, when King Robert founded the Order of the Star, out of homage to the Virgin Mary, the star of the Sea. Although the *Gennet* was the first order or brotherhood known in France, it had not been unusual to reward that sort of valour, which was considered the peculiar distinction of a knight, in individuals. Thus, we read of Chilperic bestowing the bauldric, or girdle, as a reward for great courage. This bauldric is termed the "royal gift," a king alone having the privilege to bestow this jewelled girdle, which, by its mounting, differed from the plain gold girdles worn by such nobles as cared to put them round their loins. Although this order was instituted especially in honour of the Virgin, it became remarkable for the good eating and drinking of the companionship more than anything else. They had promised to be vigilant, but the insignia of the star and collar were given to the Chevaliers of the Watch, and the knights caroused while their deputies kept ward. Sumptuous, and even profligate, as some of those banquets were, we find that young princes waited at the table,—that is, if they had not been knighted; for it was a rule that no son, not of the order of chivalry, could sit down at the same table with a sire who was a belted knight.

French Or-
der of the
Thistle.

There was a French Order of the Thistle, which was, during a considerable period, of much celebrity. It was founded by Louis II., Duke of Bourbon, in 1463. The order was instituted on the duke's wedding-day, out of gratitude to the Virgin, who had endowed his highness with a bride of great beauty, to whom he behaved, as those mirrors of chivalry, the Guises, did to their wives, very "cavalierly." It was thought sufficient if a man were only exquisitely polite to the wife whom he shamelessly betrayed. When the merit of Louis XV. was noticed in a funeral oration, the reverend speaker said of that sovereign of the Order of the Holy Ghost, that however he may have lacked fidelity to his spouse, he never uttered a cross word to her.

The knights of the French Order of the Thistle were twenty-six in number. On the gold chain which they wore round the neck were interwoven links so fashioned and disposed as to form the word *Esperance*. From the chain was suspended an oval-shaped ornament of gold, in the centre of which, above a half-moon, stood the Virgin, surrounded by rays, and crowned with a coronet of twelve stars. From this oval hung a thistle blossom. The dress and the statutes of this order bore a close resemblance to those of the knights of the Order of the Garter.

The French Order of the Thistle was patronized, not

by St Andrew, but by our Lady. On the other hand, Russia has an order of St Andrew, which has no connection with the Thistle. The Muscovite order was founded by the Czar, Peter Alexiewitz, in the year 1698. It was at first conferred only on those who had borne themselves bravely against the Turks. Subsequently, they who had distinguished themselves in the Swedish wars were admitted; and finally, it was given indiscriminately to great soldiers and civilians of merit at home; and it often served to distinguish the officers in foreign courts who were in the interest of Russia. The knights carry a "St Andrew's cross," with the figure of the Apostle, with a smaller cross beneath, and above, an ornament rather complicated, but in which may be defined the double-headed eagle. A portion of the inscription of the original crosses stated, very characteristically, that the order was founded by "Peter, possessor and autocrat of Russia."

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Russian
Order of
the Thistle.

We have already incidentally noticed the French Order of St Michael, which long since fell into disuse, through its honours being rendered too common and too cheap.

French Or-
der of St
Michael.

King Henry III. abolished the Order of St Michael, which had fallen into contempt, and created in its stead that of the Holy Ghost. The intention was good, but it failed of its end. It soon became overcrowded. One rule was, that no one could gain admission who could not show certain proofs of his nobility. This proved no safeguard. Candidates for admission forged papers without scruple, or produced whole cart-loads of titles from Italy, which the examiners passed without reading. The Marshal de Biron, in submitting his papers to the king, observed that his titles were set out therein, but that he had a better one at the point of his sword. One gentleman who could not prove his nobility, did as good, by presenting the king with a couple of puppies; and, as these were of a breed of dogs much prized by the monarch, he very appropriately clapped a collar on the neck of the donor.

The Order of St Louis was founded, or perhaps restored, on an ancient foundation, by Louis XIV. In process of time it became even more common than that of St Michael had been; and it was no unusual thing to see the diminutive cross of the order tacked to the button-hole of individuals who were hardly honest enough to pay for the coat on which sparkled the decoration.

Order of St
Louis.

The Legion of Honour has taken place of all the French orders, but it is, in truth, less a chivalrous body than a vast crowd of scattered members, who are not companions, in the knightly sense of the word, but who wear the cross in testimony of some particular merit—now, that of gaining victory on a stricken field, anon for a new fashion in very humble matters of dress. It is worn by monarchs and man-milliners; the classes being different, but the members of them being all alike legionaries.

Legion of
Honour.

We may here notice a few of those orders which have been remarkable for their singularity. Among them were the Knights of the Holy Ampulla, who were knights only for a day, and who carried the *Sancta Ampulla*, or holy chrysm, at the coronation of the kings of France. In contrast with these ephemeral knights may be noticed the *Ladies of the Axe*. This was a Spanish order, founded by Raymond Berengarius, count of Barcelona, at Tortosa, in 1148, in honour of those stout-hearted Aragonese ladies who beat back the Moors in a siege. The weapon which they wielded so effectually at the siege of Tortosa was figured on their cap and mantle. The members had several privileges. They took precedence, in all public ceremonies, of the men (a privilege which does not give satisfactory warrant of the general gallantry of Spain); they became, as widows, exempt from all taxes, and they inherited all jewellery and female ornaments, without partition of value with any of their brothers.

Miscellaneous
Orders.

The Moors had, before this, given rise to an order of

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chivalry—that of the Knights of the Oak. In the eighth century, Garcia, king of Navarre, was about to withdraw from before a large Moorish force, when he beheld a cross in an oak; believing this to be a sign from heaven, he charged victoriously, and, at the conclusion of a sanguinary conflict, founded that chivalry of the oak, the members of which were remarkable for their superstition and daring courage.

It was a different motive that created the “Order of the Brotherhood opposed to Cursing and Swearing,” or *vitandarum execrationum scurrilitatisque colibendæ causa Vimaræ sociæ*. This order was established at the close of the sixteenth century, by the Saxon dukes William and John, at Weimar. At this period hard drinking and unseemly language were prevalent in Germany; with great profession of piety, nevertheless, on the part of those whose practice was so discreditable. Licentiousness of speech was such a characteristic of table manners, that we read of banquets at which he who presided rang a bell fixed beneath the board, and when this sound was heard, the blaspheming guests were bound to bridle their profane tongues, and observe greater cleanliness of expression. It would seem that the noble-born who were distinguished for their purity were raised to companionship in this order, the symbol of which was a gold medal suspended from the neck.

Some orders have been founded on an error, as, for example, that of the Order of the Girdle of Hope, by Charles VI. of France, who, having lost his way when hunting, and found the right path again, attributed his good fortune to “our Lady,” and founded this order in her honour. Charles, however, was held by the theological heralds to have thereby done considerable wrong to St Hubert, who, if he had not sole sovereignty over woods and chases, yet was of such consequence, that no one wandering in their labyrinths could escape without his sanction and aid. George William of Leignitz, when he founded the Order of the Golden Stag, in 1672, in honour of a brilliant day, for which the duke was grateful to St Hubert, much better understood, according to the ideas of the time, where his gratitude was due.

There was more of marked singularity in the old Venetian Order of the Boot, which was founded in 1400, by the Duke Michael Steno, for the encouragement of youths in warlike exercises both by sea and land. The members of this order wore an embroidered boot, decked with precious stones, on either the right or left leg indifferently. The absurdity consisted in there being but one boot for each knight, but Michael Steno no more thought a pair of boots necessary for his chevalier than Edward did a couple of garters for his “companions” at Windsor.

The Emperor Sigismund of Germany is one of the few potentates who founded an order which died with the founder. On his return from the Council of Kostnitz in Hungary, in 1418, he founded the knightly brotherhood of the Overthrown Dragon. The members wore, suspended from a chain round the neck, the figure, in gold, of a dragon, overthrown, and with his wings flapping, crushed, and helpless. There were many who rightly read in this terrible hieroglyphic the stern resolution of the imperial grand-master and knights to pursue to the death John Huss, Jerome of Prague, and their followers.

St Michael was the patron of more than one order in Spain, founded out of gratitude for succour against the irreligious, particularly the Moors, or to invoke such succour. The Brothers of St Michael's Wing, with their device of *Quis ut Deus*, did good knight-service against the Moors, and rendered acceptable help to all sorely-pressed Christians in the bloody days of the fierce contests between the two antagonistic peoples.

Some princes have founded orders for the furtherance of friendship, but they seem to have been rather pleasant ca-

prices than anything more serious. So, Elizabeth Christina, Empress of Germany, founded, in the last century, at Vienna, the Order of Love for Your Neighbour. As the order was open to both knights and ladies, and as either lady or knight wearing the order could bestow the insignia once on a very dear friend, the wits had much to remark touching such regulations. These were subsequently modified; but the order, with its agreeable legend of “Amore Proximi,” was the desired object of many an aspirant. It was not the first of its class which arose, as fighting began to be a little less common than in days of old, and Christian people had more leisure to cultivate friendly relations.

There was a still more singular order, confined to knights only, and which is said to have peculiarly belonged to the house of Montmorency. The tradition relates, that after a feud, in which the King, Louis, sided with the Abbot of St Dennis against Bouchard Barberotte de Montmorency, first baron of France, a reconciliation having been established, Montmorency appeared before his sovereign with a company of knights, all of whom wore a thong (Hirsch-Geweihe), from which was suspended the figure of a dog. This was supposed to be a tacit assertion of their fidelity towards the king. The knightly brotherhood not only flourished, if the old chroniclers speak truly, but Montmorency is said to have founded a second, that of the Cock, and to have subsequently amalgamated the two. Of the order, however, either of Dog or Cock, very little is known, and that little is very doubtful. We suspect that the orders attributed to the house of Montmorency are as truly legendary as that of the Waning Moon, which romancers ascribe to St Louis in 1269; and which, it is added, though it ceased with his demise, was temporarily renewed by Charles of Anjou, when he obtained possession of Sicily. This order, we are told, was founded in opposition to the infidel Order of the Crescent, founded by Soliman II. Perhaps the most remarkable fact connected with the latter is, that the famous Christian painter, Gentilis Bellino, was a member of the order. At such a period, this showed more liberal toleration on the part of the Turkish sovereign than was exhibited by the King of France, in 1665, with respect to the Star of St Michael. Originally that order had been founded in opposition to the Garter and the Golden Fleece, but it was given to the most worthless, or sold to them, when foolish purchasers could be found. Even from an order so degraded as this, the king ejected all Protestants, and declared them incapable of wearing the brilliant insignia. Of a plainly-dressed Protestant of those days, standing in the midst of a glittering crowd of Knights of St Michael, might have been said what was said of Viscount Castlereagh, when he stood, the only man in a plain dress coat, amid the gilded and embroidered members of the Congress of Vienna, “Ma foi, il est très distingué!”

The history of comic companionships would require a separate, and not a very brief article. These, indeed, were not knightly orders, but societies founded in imitation of them, and with mirthful, though not always useless, ends in view. Of these we can only notice the principal; and first among them stands the Order of Fools, or Company of Simpletons, founded by Adolph Count of Cleves in 1381, for three dozen knights, who were bound by ordinances, the originals of which still exist in Germany. The “decoration” consisted of a small fantastic figure of a court fool, holding fruit in his hand, as a sign of the affection which the court's knightly fools were expected to bear the one to the other. They met in solemn assembly on the first Sunday after Michaelmas, and separated the Sunday following. From this meeting no member dared be absent, unless incapacitated by grievous illness, or engaged in business at a distance of six days' journey from Cleves. There were fines for non-attendance, and for not wearing the symbol of the Fool, but these were given to

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the poor, after being rigorously exacted by the king and council annually elected to preside over the order. If any members died between the anniversary meetings, it was the first business of the community to proceed to the cathedral and celebrate a mass in their honour, with abundance of prayer to rescue them from purgatory. The least foolish part of the ceremonial used by this "Company of Fools" was in their brotherly reconciliations. If two members happened to be at feud, they presented themselves before the king and council, during the grand assembly, on an appointed day, and embraced each other, before the sun went down. As peacemakers and charitable persons the noble members of this companionship were not such fools as they pretended to be. At a time when the soldier's vocation was the only one greatly honoured—when there was little equality among men, and compassion for the suffering was by no means general—it was no folly which moved the court to form a companionship in which every member was equal, the rulers being only nominally superior to their fellows, and the object of which was to reconcile the estranged, and to relieve the poor.

The "Dijon Infantry," or the "Mother of Fools," was a society early formed on the model of that of Cleves, and re-formed, in the fifteenth century, by Philip the Good, Duke of Burgundy. There was, however, no limit, whether with respect to number or quality of the members. These amounted to several hundreds, and among them were princes, bishops, dignitaries of parliament, artists, and tradesmen. The rules and the formulas of reception were in very rough rhymes. One object in view was to forget worldly cares over very sumptuous banquets, and another was to censure the views and criticise the sayings and doings of society generally. The order of the "Mother of Fools" met yearly about carnival time; and, in the dresses of labourers in vineyards, the members rode through the town, singing satirical songs as they went, and attracting universal attention in their green, red, and yellow costume, with bells on their two-pointed and tri-coloured caps, the *marotte*, or stick with a zany's head upon it, in their hands, and the sublime "Mother of Fools" leading the joyous and very mixed company. The officers were numerous, and over all waved the sacred banner, with the undeniable device, "Stultorum infinitus est numerus." This banner was protected by a guard of sixty knights; and the august person of the "Mater Stultorum" was surrounded by fifty chevaliers, selected from among the most skilful artists of the city. The processions were at once magnificent and burlesque; and the power acquired by the children of "La Mère Folie" was extraordinary. If a citizen offended a member of the order, he was summoned to answer the charge made in presence of the Mother, who was, of course, a man. If a citizen declined to appear, he incurred a fine. If he refused to pay the penalty, six officials were sent to compel him to obedience. These took up their quarters in a neighbouring town, where they lived at his cost, while they levied a distress on his goods, and sold them to the highest bidder, the law giving them this strange authority, and refusing to interfere in behalf of the recusant burgher. Such an order was likely to fall into lamentable excesses; and, as a consequence of these, the order was suppressed in 1630, though twenty years later the then surviving members were allowed to ride in procession, in order to carry up some compliment to the authorities. The last "Mother of Fools" was Philippe des Champs, procurator of parliament, and syndic of the states of Burgundy.

During the fifteenth and sixteenth centuries the "Societas Cornadorum," or Order of Hornbearers, flourished at Evreux and Rouen, under the auspices of the parliaments of Paris and Rouen. As the members of the order bore a hare's tail in the front of their caps, and wore a fox's brush round their necks, their proper appellation may have

been "Societas Caudinadorum," or Order of Tail-Bearers. The objects of the order were originally like those of the Dijon Infantry and the Mother of Fools; but these were forgotten, and, in the interest of morality, it became necessary to abolish the "Cornardi." The sole merit of this comic chivalry consists in the additions made by them to the stock of macaronic poetry, in which form they lashed vices in churchmen and people which they were not ashamed to practise themselves.

The "Kingdom of the Bazoche" was the high-sounding title of an order of French law-students, founded when the parliament of Paris was first established in that capital, and deriving its name from the Greek word *βαζέω*, which implies that sort of loquacity in which a lawyer does not always say what he thinks, but boldly pledges his conscience for the truth of an assertion, and deems the honour of the bar to be satisfied by calling it a "mere formula." This order, which had much to do with comic literature, was founded in 1303, and was suppressed in 1476, with all its plays, mysteries, recitations, and roystering festivals. Its constitution was on the knightly principle, and the grand-master was styled king. This title was not an uncommon one for the chief of any community. The company of mercers (in France) had their king. One of the stewards of the royal household bore the name in derision, perhaps of his office, that of a sort of provost over the lower servants of both sexes. At this day, too, Belfast has, not its "mayor," but its "sovereign." In more recent times the Order (or Regiment) of the Calotte in France was one of those companies which, for a while, tilted with points of satire against the follies and vices of mankind, as the knights used to do, more seriously, against the oppressors of the weak and the enemies of the faith.

But it is time to close this imperfect record; and we perhaps cannot do so more appropriately than by giving a chronological list of some of the principal orders under which chivalry has been most distinguished.

RELIGIOUS AND EQUESTRIAN-CHAPTER ORDERS.

1. St John of Jerusalem, subsequently Knights of Rhodes and of Malta..... A.D. 1043
2. The Knights Templars..... 1118
3. The Teutonic Order..... 1191
4. The Order of St Joachim..... 1755

PAPAL ORDERS.

About a dozen are ascribed to the popes at various times, but these seem to have been mere guilds. The sole exception is in the Order of the Golden Spur (1559), of which Gallini the ballet-master was made a knight by Pius VI. Lord Kenyon refused, in a court of law, to take his testimony as that of "Sir John Gallini;" but Coke had previously settled that a knight, by whomsoever created, remained a knight, all law to the contrary notwithstanding.

THE CHIEF IMPERIAL ORDERS.

1. St Constantine, originally of the Greek Empire, subsequently Neapolitan..... A.D. 313
2. St Andrew (and St Catherine) of Russia..... 1698
3. St George of Russia..... 1782
4. St Alexander Newskoi..... 1700
5. Maria Theresa (Austria)..... 1757
6. St Stephen of Hungary..... 1764
7. St Vladimir..... 1782

To these may perhaps be added, the Turkish *Crescent*, the Persian *Lion and Sun*, and the Legion of Honour (1802), which is not a military order exclusively, the cross being often conferred, as a medal is given to distinguish the wearer, without admitting him to knightly privileges. This order was founded by Napoleon I.

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CHIEF ROYAL ORDERS.

Round Table, England	A.D. 52.
The Avis	1147
Calatrava	1158
Alcantara	1170
St James of Compostella	1175
White Elephant of Denmark	1190
Dannebrog	1219
Montera	1317
Christ of Portugal	1319
White Eagle of Poland	1325
Seraphim	1334
Garter	1343
Bath	1399
Annunciation of Savoy	1355
St Maurice of Savoy	1454
St Michael of France	1469
The Sword	1525
The Thistle 809, revived	1540
Holy Ghost	1578
St Lazarus	1607
Generosity of Prussia	1685
St Louis of France	1693
Black Eagle of Prussia	1701
Fidelity	1732
St Januarius	1738
Military Merit	1740
Polar Star	1748
Military Merit (France)	1769
St Stanislaus	1765
Immaculate Conception, or Charles III. of Spain, founded on the old "Oak of Navarre"	1771
Vasa	1772
St Patrick	1783
St Ferdinand and Merit, Sicily	1800
Iron Crown, for Italy only	1805
Leopold	1831
Saviour, Greece	1833

PRINCELY AND DUCAL ORDERS.

The orders of St Mark and of the Golden Stole of Venice, date from the earlier times of the Doges; added to these are—

The Golden Fleece	A.D. 1430
St Stephen of Tuscany	1561
Sincerity, or the Red Eagle of Bayreuth, subsequently the Red Eagle of Prussia	1705
Fidelity of Baden Durlach	1716
White Falcon of Saxe Weimar	1732
St Anne of Holstein (now Russia)	1735
The Chase of Wurtemberg	1719
Happy Alliance (Saxe Hildburgerhausen)	1749

KNOLLES, RICHARD, the author of a famous *History of the Turks*, was born in Northamptonshire about the middle of the sixteenth century; he studied at Oxford, and became master of the free school of Sandwich in Kent, where he died in 1610. He was the author of a *Latin-Greek Hebrew Grammar*, and of some minor works bearing chiefly on Oriental history. On his *General History of the Turks* he spent twelve years of his life. On the strength of this book Johnson, in a number of the *Rambler*, assigned to Knolles the first place among English historians. "His style," says the great critic, "though somewhat obscured by time, and sometimes vitiated by false taste, is pure, nervous, elevated, and clear." The verdict of Johnson is confirmed by Hallam; but a perusal of the work will satisfy most modern readers that these flattering criticisms are completely overcharged. There is a strong smack of ill-natured truth in the remarks of Walpole, who said that, as a history, the work was a tissue of fables, and, as a piece of style, one of the most wearisome books in the world, with weak sentences of a page long. Several continuations of the work have been published, the best being by Paul Ricaut, folio, London, 1680; but as a history it is now entirely superseded.

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St Charles of Wurtemberg	A.D. 1759
Military Bravery, Hesse Cassel	1769
Golden Lion, do.	1785
Military Merit, Wurtemberg	1799

ELECTORAL AND ARCHIEPISCOPAL ORDERS.

St Hubert of Juliers	A.D. 1744
St Rupert of Salzburg	1701
St George of Bavaria	1729
St Henry of Saxony	1736
The Palatine Lion	1763

ORDERS FOR LADIES.

Amaranth, Sweden	A.D. 1645
Slaves to Virtue (Austria)	1662
Neighbourly Love, do. ....	...
Starry Cross, Austria	1688
St Catherine, Russia	1714
St Ubrica, Sweden	1734
The Death's Head	1756
St Elizabeth, Palatine	1766
Maria Therese (Spain)	1792

Spain has been most prolific in orders of chivalry, which have lived for a while, and then made way for others; the principal have been the Lily of Navarre, in the eleventh century; St Saviour in the twelfth century; the Holy Rosary of Toledo, and St George and Alfame in the thirteenth. In the following century were founded the orders of the Dove, the Croce della Scama, and the Scarf. The Lily of Aragon, in the fifteenth century, rivalled the renown of the ancient Oak of Navarre (722); and Spanish gallantry created the orders of St James, Calatrava, and Mercy, for the enrolment of ladies only.

With this list we dismiss the subject of Knights and Knighthood, quoting herewith the lines of Spencer, who, showing what knight *should* be, by what Sir Calidore *was*, says,—

"Nor was there knight, nor was there lady found,
In Fairy Court, but him did dear embrace,
For his fair usage and conditions sound,
The which, in all men's liking, gained place;
And, with the greatest, purchased greatest grace,
Which he could wisely use, and well apply,
To please the best, and th' evil to embase;
For he loathed leasing and base flattery,
And loo-ed simple truth and stedfast honesty."

(J. D—R—N.)

KNOX, JOHN, the great reformer of Scotland, was born at the village of Gifford in Haddingtonshire in the year 1505. His father is said, though perhaps without foundation, to have been descended from the family of Ranfurly, in the county of Renfrew. The name of his mother was Sinclair; and some of his letters, written in seasons of danger, were subscribed John Sinclair. Whatever might be the lineage or the situation of the father, the son was enabled to obtain the benefit of a liberal education, such as his native country could then afford. After having been instructed in the Latin language at Haddington School, he was, in the year 1521, sent to the University of Glasgow, where philosophy and divinity were taught by John Mair, a celebrated schoolman. The Greek and Hebrew languages were not then publicly taught in Scotland; but the former of these he acquired when he was yet in the vigour of life, and the latter during the period of his continental exile. It is not sufficiently ascertained that he took a degree; but if it be correctly stated that he publicly taught philosophy in this university, and afterwards at St Andrews, we are perhaps to infer that he was a master of arts.

He soon felt himself dissatisfied with the dry and barren speculations of scholastic philosophy and scholastic theology.

Knox. Not contented with the extracts "from ancient authors which he found in the writings of the scholastic divines and canonists, he resolved to have recourse to the original works. In them he found a method of investigating and communicating truth to which he had hitherto been a stranger, and the simplicity of which recommended itself to his mind in spite of the prejudices of education and the pride of superior attainments in his own favourite art. Among the fathers of the Christian Church, Jerome and Augustine attracted his particular attention. By the writings of the former, he was led to the Scriptures as the only pure fountain of divine truth, and instructed in the utility of studying them in the original languages. In the works of the latter, he found religious sentiments very opposite to those taught in the Romish Church, who, while she retained his name as a saint in her calendar, had banished his doctrine, as heretical, from her pulpits. From this time he renounced the study of scholastic theology; and although not yet completely emancipated from superstition, his mind was fitted for improving the means which Providence had prepared for leading him to a fuller and more comprehensive view of the system of evangelical religion." (M'Crie's *Life of Knox*, vol. i., p. 41, 5th edit.)

During the persecution which followed the spread of the reformed faith in Scotland, Knox was engaged in teaching philosophy in the university of St Andrews, though it does not clearly appear that he held the office of a regent or professor. Many persons of his acquaintance had embraced the reformed doctrines; but he did not openly profess himself a Protestant till the year 1542. As he began to recommend to his pupils a more rational and edifying method of study, he excited some suspicions of heresy; but when he proceeded so far as to expose certain corruptions of the church, he speedily found it necessary to change his place of residence. Having retired to the south of Scotland, and there avowed his adherence to the cause of reformation, he was declared a heretic, was degraded from his orders, and was even in danger of his life from the hand of the assassin, had he not found shelter under the roof of Douglas of Longniddry, a staunch Protestant like himself. Here he was retained in the capacity of a domestic tutor; and, as occasion offered, preached openly in the Protestant interest to the inhabitants of the surrounding district.

In 1546, when the martyrdom of George Wishart had been avenged by the murder of Beaton, Knox, though he had borne no hand in the cardinal's death, was one of the many unconcerned in it who took refuge in the Castle of St Andrews. During the siege of that stronghold by the royalist party under the regent Arran, Knox was persuaded to officiate as one of the chaplains of the garrison, and, by his labours among the citizens of the town, confirmed the waverers, besides gaining many new converts to the reformation. For more than a year the Protestants held their ground in St Andrews, till strong reinforcements from France enabled the besiegers to invest the place by sea and land. After a vigorous resistance they were compelled to accept terms of capitulation from Leo Strozzi, the commander of the foreign auxiliaries. It was stipulated that their lives should be spared, that they should be removed to France, and that such of them as declined entering into the French service should be conveyed to any other country except Scotland. Knox, sharing the fate of his companions, was conveyed on board one of the French ships to Rouen; but the terms of the capitulation were grossly violated, and, at the instigation of the pope and the Scottish clergy, the captives were treated as prisoners of war. The leaders were committed to close custody in Rouen, Cherbourg, Brest, and Mont St Michael; while Knox and some others were sent on board the galleys, and, after being loaded with chains, were compelled to labour at the oar. Here they were subjected to many other indignities; but,

in spite of every hardship and every threat, not one of their number could be impelled to renounce his faith. During the ensuing winter, the galley in which he was confined lay in the River Loire; and, in the summer of 1548, it sailed for Scotland, and cruised off the east coast, for the purpose of intercepting English vessels. The hardships to which he was now subjected produced a very serious effect upon his health: he was seized with a violent fever, and no hope was entertained of his recovery. He however regained his strength, and during his captivity had sufficient energy of mind to compose more than one religious treatise. His treatise on prayer, written during this season of affliction, was afterwards published. After a captivity of nineteen months, he was restored to liberty in February 1549. Of the circumstances which led to this event various accounts have been given; but, according to Dr M'Crie, "it is more than probable that he owed his deliverance to the comparative indifference with which he and his brethren were now regarded by the French court, who, having procured the consent of the parliament of Scotland to the marriage of Queen Mary to the dauphin, and obtained possession of her person, felt no longer any inclination to revenge the quarrels of the Scottish clergy."

Knox immediately directed his course to England, where his merits and his sufferings were neither unknown nor unregarded. Soon after he made his appearance in London, he received an appointment to officiate at Berwick, where he began to preach with his characteristic fervour and zeal. He exposed the errors of popery with an unsparing hand, and his labours seem to have been attended with no inconsiderable success. The tendency of his zeal was not, however, calculated to recommend him to the bishop of the diocese, Dr Tostall, who was strongly attached to the old faith. Having been accused of asserting that the sacrifice of the mass is idolatrous, the preacher was cited to appear at Newcastle on the 4th of April 1550, before the Bishop of Durham, and to give an account of his doctrine. In presence of a great audience, Knox entered into a full defence of his opinions, and with the utmost boldness proceeded to demonstrate that the mass is a superstitious and idolatrous substitute for the genuine sacrament of the Lord's supper. The bishop did not venture to inflict any ecclesiastical censure; and the fame of the obnoxious preacher was extended by this attempt to restrain the boldness of his attacks on the errors of Romanism. Having remained at Berwick till the close of the year, he was afterwards removed to Newcastle, and in December 1551 was appointed one of King Edward's chaplains in ordinary, with an annual salary of £40, which at that period was no mean provision. In the course of this year, the *Book of Common Prayer* was subjected to a revision, of which it stood in considerable need; and Knox having been consulted, among other divines, was chiefly instrumental in procuring a material alteration in the communion service, which at first was too favourable to the doctrine of the real presence. One vestige of this doctrine is still preserved in the kneeling posture of the communicants, which manifestly derives its origin from the popish adoration of the host.

The freedom of his discourses in the pulpit gave offence to various individuals, and among others to the Duke of Northumberland, warden-general of the northern marches; and having been accused of high misdemeanours, he was cited to appear before the privy council, which at that period possessed an extensive and ill-defined jurisdiction. But the malice of his enemies was completely foiled. Knox was fully cleared from every imputation of blame; and having been employed to preach at court, he made so favourable an impression on the young king that he expressed his anxiety to promote him in the church. It was resolved by the council that during the following year he should

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Knox.

preach in London and the southern counties. Having returned for a short time to Newcastle, he accordingly repaired to the metropolis in the beginning of April 1553. Archbishop Crammer had previously been directed by the council to present him to the rectory of All-Hallows; but Knox declared that in the existing state of the church he could not conscientiously accept of any preferment. He was again summoned before the council, where he gave an unreserved explanation of his sentiments on that subject. Nor could the promise of much higher promotion induce him to disregard the admonitions of a scrupulous conscience: the king, with the advice of his council, made him an offer of a bishopric; but instead of availing himself of so favourable an avenue to worldly honours, he declared the office of a bishop, as exercised in the English Church, to be destitute of divine authority. It is sufficiently evident that he considered that establishment as but imperfectly reformed from the errors of popery; and that, in his estimation, the new prelacy, retaining all the proud trappings, as well as the political character, of the old, was very widely removed from the simplicity of an evangelical church. The premature death of the king, on the 6th of July 1553, was fatal to the further progress of reformation, and a cloud of spiritual darkness again overshadowed the land.

During his residence at Berwick, Knox had formed a lasting attachment to Majory Bowes. Her father was Richard, the youngest son of Sir Ralph Bowes of Streatlam; her mother was Elizabeth, a daughter and coheir of Sir Roger Aske of Aske. The match was cordially approved by the mother of the young lady, but having been opposed by her father, it was not concluded till after a considerable interval. After the king's death, he had some intention of settling at Berwick, or in the immediate neighbourhood; but he soon discovered that he could not safely reside in a kingdom ruled by so bigoted and cruel a sovereign as Mary soon showed herself to be. He therefore sailed for France, and landed at Dieppe on the 20th of January 1554. Having lingered there till the last day of February, he pursued his solitary way through France, and arrived in Switzerland; but in the beginning of the ensuing month of May he retraced his steps to Dieppe, with the view of obtaining intelligence from his friends in England. At that period the intercourse between different countries was slow and precarious; nor was this the only occasion on which he returned to the same place for the same purpose. While he continued to reside on the Continent, he received remittances from his friends in Scotland as well as in England, but his means of life were neither certain nor ample. Geneva became for some time the chief place of his abode, and here his exile was cheered by the friendship of Calvin. The two reformers had embraced the same opinions with respect to the leading doctrines of the Christian faith, and in their personal character they exhibited several conspicuous points of resemblance. In their notions of ecclesiastical polity they preserved the same agreement; and the authority of Knox, supported by that of Calvin, has contributed to establish in this country a simple mode of discipline and worship, to which our ancestors adhered with unconquerable resolution, and in support of which many of them were found ready and willing to shed their blood.

The leisure which he enjoyed at Geneva was profitably spent in study, to which he devoted himself "with all the ardour of youth, although his age now bordered upon fifty. It seems to have been at this time that he made himself master of the Hebrew language, which he had no opportunity of acquiring in early life." Many pious and learned men had now been driven from England by the cruelty of Queen Mary, and most of them sought refuge in the Protestant states of Germany and Switzerland. Those who resorted to the imperial city of Frankfort were allowed the joint occupancy of a place of worship; and it was unani-

mously resolved to discontinue the use of the surplice, the litany, the audible responses, and some other superfluities which might rather excite the surprise than the approbation of their foreign brethren. Having determined to elect three pastors, they sent a letter of invitation to Knox, subscribed by twenty-one of their number, at the head of whom stands John Bale, the exiled Bishop of Ossory. It was not without some degree of reluctance that he consented to leave his retreat at Geneva; he however repaired to Frankfort in the month of November 1554, and entered upon the duties of his new charge, but his connection with this congregation proved a source of great uneasiness and mortification. Various dissensions, which arose among its members, were chiefly occasioned by a difference of opinion as to the propriety of adhering to the English service; and those dissensions were greatly fomented by Dr Cox, who had been preceptor to King Edward, and who afterwards became Bishop of Ely. In the progress of the controversy Knox appears to have acted with dignity and moderation, but the upholders of the liturgy were not easily diverted from their purpose. When all other expedients failed, two of their number, with the approbation of others, sought a private interview with the magistrates, and accused him of treason against the Emperor Charles, his son Philip, and his aunt the Queen of England. This extraordinary charge was founded upon certain passages in his tract published in 1554, under the title of *A Faithfull Admonition unto the Professours of Gods Truthe in England*. Of the futility of such an accusation the magistrates were sufficiently aware; but they nevertheless deemed it advisable for him to withdraw from Frankfort, and he availed himself of the suggestion which they conveyed to him. On the evening of the 25th of March 1555, he delivered a farewell discourse to about fifty members of the congregation; and on the following day they accompanied him several miles on his journey. He immediately returned to Geneva, and he experienced a cordial welcome from Calvin. There he continued till the month of August, when he again proceeded to Dieppe; and having embarked in a vessel bound for Britain, he landed near the eastern border of the two kingdoms about the end of autumn. On reaching Berwick, he found his wife and mother living in comfortable circumstances. With them he remained for some time, and afterwards pursued his journey to Edinburgh, where he took up his abode with a citizen named John Syme, to whose house the friends of reformation repaired as soon as they were aware of Knox's arrival.

Notwithstanding the rigour of the penal laws, the votaries of the Protestant cause were not entirely extirpated or dispersed. The Queen Dowager, Mary of Lorraine, having succeeded in her attempt to supplant the Earl of Arran, had been appointed regent on the 10th of April 1554. She was sufficiently disposed to continue the corruptions of the church, but several prudential considerations restrained her from pursuing more violent measures. Some of the Protestants who were driven from England by the atrocities of Queen Mary were permitted to live in Scotland without molestation, and even to meet, though with some degree of privacy, for the purpose of worshipping God according to the dictates of their own conscience. A comparatively small number of the population had as yet openly renounced the Romish creed; and of those who were most inclined to the Protestant doctrines very few had ventured to discontinue their attendance at mass. Knox was deservedly scandalized at this want of firmness and consistency: a meeting, attended by William Maitland of Lethington, and other leaders of the party, was held for the avowed purpose of discussing the lawfulness of such compliances; and Knox succeeded in his attempt to convince them that all participation in the worship of the Romish Church was to be avoided by those who were convinced of her gross errors. Nor were his ex-

Knox.

Knox.

ertions confined to the metropolis. He accompanied John Erskine of Dun to his seat in the neighbourhood of Montrose; and during a visit of a month he preached every day, being attended by the principal persons of the adjacent district. On his return to the south, we find him residing at Calder House, the seat of Sir James Sandilands, afterwards Lord Torphichen, an early, zealous, and consistent friend of the Reformation. In the hall of this baron, who was preceptor in Scotland of the Knights of St John of Jerusalem, he preached and administered the communion. Here his ministrations were attended by several persons of distinction; and among these were Archibald Lord Lorne, afterwards Earl of Argyle, John Lord Erskine, afterwards Earl of Mar, and James Stewart, Prior of St Andrews, afterwards Earl of Moray, all of whom received religious impressions, which influenced the future course of their lives. Early in the subsequent year, 1556, he was accompanied to the district of Kyle by Lockhart of Dunbar, and Campbell of Kineancleuch. This division of Ayrshire had been the principal seat of the Lollards in Scotland, and it then contained many friends of the purer religion. They were not, therefore, unprepared for his reception: he preached not only in the town of Ayr, but likewise in the houses of Bar, Kineancleuch, Carnell, Ochiltree, and Gadgirth, and in several of these places the holy communion was now dispensed. Before Easter, he paid a visit to Finlayston, the residence of Alexander Earl of Glencairn, one of the most strenuous friends of the Reformation. In this baronial castle he also preached and administered the sacrament. Returning to Calder House, he next determined to visit his friends in the north; and during his second residence at Dun he was emboldened to preach in a more public manner. Many gentlemen of that vicinity made an open profession of the reformed faith; and, in order to strengthen their cause, they entered into a solemn engagement to renounce the communion of the Popish Church, and, to the utmost of their ability, to promote the pure preaching of the gospel. "This," says Dr M'Crie, "seems to have been the first of those religious bonds or covenants by which the confederation of the Protestants in Scotland was so frequently ratified."

As he now began to preach more openly, the ecclesiastics felt a natural alarm for the safety of a tottering church; and the friars testified their zeal by urging the bishops to proceed with rigour against such an offender. He was accordingly cited to appear before an assembly of the clergy, to be held at Edinburgh in Blackfriars Church, on the 15th of May; but when they found that he did not shrink from this discussion, and that he was supported by some persons of influence, they sought a pretext for superseding the citation on the ground of its informality. On the very day which had been appointed for his appearance he preached in the Bishop of Dunkeld's house to a much larger auditory than had previously attended him in Edinburgh; and during the ensuing ten days he regularly preached twice a-day in the same place, without being exposed to any molestation. About this period the Earl Marischal attended one of his evening discourses; and it may be regarded as a proof of his favourable impression, that he united with the Earl of Glencairn in an earnest request that Knox would address to the Queen Regent such a letter as might induce her to extend her protection to the Protestant preachers. A letter was accordingly addressed to her, and it was delivered by the Earl of Glencairn; but it does not appear to have produced any change in her sentiments. This letter he afterwards published, with some additions. In the meantime, he received from the English congregation at Geneva an invitation to become one of their pastors. He readily listened to their call, and made arrangements for removing thither, accompanied by his wife, as well as by her mother, who had now lost her husband. He embarked them on board a vessel bound for Dieppe, and paid another visit

to the several places where he had disseminated the truth of the Gospel. He visited the Earl of Argyle at Castle Campbell, and there he repeatedly preached to such an auditory as could be assembled. Having thus made no inconsiderable progress in preparing his countrymen for a more general reception of the reformed doctrines, he took his leave in the month of July 1556, and joining his family at Dieppe, he again directed his course to Geneva. His colleague in his new office was Christopher Goodman, B.D., an Englishman, who afterwards became a clergyman of the Church of Scotland. Their congregation chiefly consisted of the exiles who had withdrawn from Frankfort in consequence of the dissensions already mentioned. The two pastors lived together on terms of the greatest cordiality. Knox likewise enjoyed the friendship of Calvin and Beza; and the two years which he spent in this vocation are described as the most tranquil of his public life. At this period was published a directory for worship and discipline, frequently described as the Order of Geneva; but it had been composed at Frankfort by Knox, Whittingham, Fox, Gilby, and T. Cole. The same directory was afterwards adopted by the Reformed Church of Scotland.

When the Scottish clergy were apprised of his having quitted the kingdom, they renewed the citation for his appearance; and those who had no inclination to encounter such a disputant now found themselves at liberty to proceed against him as a contumacious heretic. He was accordingly condemned to suffer death by fire; and as the sentence could not be executed on his person, it was executed on his effigy, which was in due form committed to the flames at the cross of Edinburgh. From this sentence he prepared an appeal, which was afterwards printed under the title of *The Appellation of John Knoxe from the cruell and most unjust sentence pronounced against him by the false Bishoppes and Clergie of Scotland*. In the course of the year which followed his return to Geneva, two citizens of Edinburgh, James Syme and James Baron, were the bearers of an invitation for him to resume his evangelical labours in his native country. They were furnished with credentials from the Earl of Glencairn, and the Lords Erskine, Lorne, and James Stewart. After consulting Calvin and the other ministers of Geneva, he determined to devote himself to this honourable and dangerous service; and he again pursued his way to Dieppe, where he arrived in October 1557. He had, however, the mortification of receiving letters which entirely disconcerted his plan; for he was informed that some of the Protestants already repented of the invitation which had been sent to him, and that the great body of them seemed to waver in their purpose. He lost no time in addressing a letter to the noblemen who had subscribed the credentials; and it may easily be supposed that he did not fail to upbraid them for their want of firmness and consistency. In a similar strain, he likewise wrote to Erskine of Dun, Wishart of Pittarow, and to some other individuals of the Protestant party. He lingered in France to await the course of events; and as he was familiarly acquainted with the French tongue, his talents as a preacher were not in the meantime unemployed. About this period he paid a visit to Lyon, and he is known to have preached at Rochelle. A Protestant congregation had recently been formed at Dieppe; and he was now elected one of its pastors, being associated with Delaporte. So successful were their exertions, that some of the principal persons of the town were induced to renounce Popery, and a general improvement began to be produced in the morals of the inhabitants. Discouraged by the aspect of affairs in Scotland, he at length determined to revisit Geneva, where he again made his appearance in the beginning of the year 1558. It was at this period that some of the most learned members of his congregation were engaged in preparing an English version of the Bible, and he is said to have had some share

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Knox. in the undertaking. The New Testament was printed at Geneva in 1557, and the entire Bible in 1560. This version, commonly called the Geneva Bible, is allowed by competent judges to possess great merit; and in the opinion of Dr Geddes it is generally superior to the version executed under the authority of King James. Of the former version, says Dr M'Crie, it is evident that his translators made great use; "and if they had followed it still more, the version which they have given us would, upon the whole, have been improved."

In the course of the year 1558 Knox published three different works. One of these was the *Appellation*. Another, which has also been mentioned in a former page, was *The Copie of a Lettre delivered to the Ladie Marie Regent of Scotland*. The third and most remarkable of these tracts bears the title of *The First Blast of the Trumpet against the Monstrous Regiment of Women*. This anonymous work, directed against the political government of females, attracted a very considerable degree of attention. It was speedily answered by John Aylmer, who in due time became Bishop of London. The doctrine of Knox as to the inexpediency of female rule was afterwards controverted by David Chalmers of Ormond, and by John Lesley, Bishop of Ross. Whatever opinion may be formed of his theory, it must at least be admitted that, either in England or Scotland, he had seen nothing to reconcile him to the practice; and, in one of those countries, the regimen of a woman might with too much justice be termed monstrous. His literary labours were interrupted by the renewal of an invitation from the Scottish Protestants; and, at the beginning of the year 1559, he bade a final adieu to Geneva, having previously been presented with the freedom of the city. Leaving his family behind, he once more proceeded to Dieppe, where he arrived in the month of March; and, having ascertained that he would not be permitted to pass through England, he embarked for Leith on the 22d of April, and was safely landed on the 2d of the following month.

The Popish Church of Scotland was now approaching its crisis, which the presence of Knox had no small tendency to hasten. The queen regent, who for some time thought it necessary to dissemble her real sentiments, had lately evinced a fixed resolution to oppose the Reformation with all the weight of her authority; and Walter Mill had been brought to the stake by Hamilton, the profligate archbishop of St Andrews. The death of the English queen (17th Nov. 1558) produced considerable influence on the affairs of the neighbouring states, and the queen regent was prepared to adopt the most violent measures. Several of the preachers, Willock, Harlow, Methven, and Christison, were cited to appear at Stirling before the High Court of Justiciary on the 10th of May, that is, eight days after Knox's return; and very soon after his arrival had been announced to Mary he was proclaimed a rebel and an outlaw. The four preachers were outlawed for non-appearance, and a fine was levied on their sureties. After remaining a single day in the metropolis, he hastened to Dundee, where the chief Protestants of Angus and Mearns were then assembled. They proceeded to Perth, and there he preached a sermon against the idolatry of the mass and of image-worship. After the conclusion of the service a riot was casually excited among the common people; and, before it was terminated, the monasteries of the Dominican and Franciscan friars, with that of the Carthusian monks, were totally demolished. The queen, who was probably glad of such a pretext, collected a considerable army, and advanced upon Perth; but she found the Protestants so well prepared for resistance that she did not hazard an attack. She proposed and ratified terms of accommodation, which she speedily showed a strong disposition to disregard. In order to ascertain the strength of their party, and to conso-

lidate its union, they formed a religious bond or covenant, which received many signatures in different parts of the kingdom. From this period they began to be distinguished by the name of the Congregation; and their noble leaders were commonly described as the Lords of the Congregation.

On his return from Perth, Knox preached at Anstruther and Crail. Disregarding the admonitions of his friends, and the threats of the archbishop, he next preached in the cathedral of St Andrews, having selected the appropriate subject of our Saviour's driving the profane traders from the holy temple. On the three ensuing days he lifted up his warning voice in the same place; and so signal was the success which attended his efforts, that the magistrates and the inhabitants resolved to establish the reformed worship in that city, the pictures and images were removed from the churches, and, on the 14th of June, the monasteries were defaced. He reached the capital in the end of the same month: on the day of his arrival he preached in St Giles's, and on the following day in the Abbey church. On the 7th of July, the body of the Protestant inhabitants of Edinburgh elected him as their minister. His wife joined him from Geneva; and her mother likewise came to end her days in Scotland. But he was soon disturbed in his new functions, in consequence of the military occupation of the city by the troops of the queen regent. He now made an extensive circuit in the southern and eastern districts of the kingdom, visiting Kelso, Jedburgh, Dumfries, Ayr, Stirling, Perth, Brechin, Montrose, Dundee, and St Andrews; nor can we doubt that the impressions produced by such a missionary were great and beneficial. After this period he was deeply engaged in the political as well as the ecclesiastical transactions of the Congregation; and the vigour of his talents, with the decision of his character, was conspicuously displayed in the steps which led to the establishment of the reformed religion. Knox, as well as Willock, concurred in advising the suspension of Mary from the office of regent. For the space of twelve months the kingdom was a prey to a civil war, in which French and English troops supported their respective allies. The contest, which had not been marked by many of the usual atrocities of intestine warfare, terminated in the month of July 1560. Parliament soon afterwards assembled; and in the course of a few days the reformed religion was established by the authority of the legislature.

Knox, after officiating for several months in St Andrews, had returned to Edinburgh at the end of April, and continued to exercise his functions during the siege of Leith. Before the close of the year, he was visited with a severe domestic affliction in the loss of his wife, who left two children of tender years. The young queen returned from France on the 21st of August 1561. Not many days after her arrival she sent for the reformer, of whose powerful influence she must have been fully aware; but neither this nor any of their subsequent interviews produced the effects which she seems to have anticipated. Such topics as Mary introduced he discussed with undaunted freedom, though it cannot with justice be affirmed that he treated her with incivility. She certainly did not overawe him with her royal presence, or render him less disposed to use his utmost endeavour in destroying the fabric of ancient superstition.

At this period the metropolis of Scotland contained only one parish church. Knox was at first assisted by a reader, named John Cairns. It was then his regular practice to preach twice every Sunday, and thrice on other days of the week; but in 1563, John Craig, minister of Canongate, was appointed his colleague. In 1562, he had for three successive days been engaged at Maybole in a public disputation with Quintin Kennedy, abbot of Crossraguel; and, in the course of the following year, an account of it was printed at Edinburgh, under this title: *Heir followeth the*

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Coppie of the Ressoning which was betuix the Abbote of Crosraguell and John Knox. Another learned Catholic, Ninian Winzet, addressed to him a *Buke of fourscoir thre Questionis*, to which it was his intention to publish an answer, though he seems to have been prevented by his other avocations, which were sufficiently numerous. After this period he incurred the hot indignation of the queen for having, in one of his public discourses, animadverted with great freedom on her intended marriage. During one of their interviews she wept bitter tears of anger; and some modern historians have been not a little scandalized at his want of gallantry. In the month of December 1563, he was summoned before the Privy Council on a charge of high treason, for having written a circular letter to the Protestant gentlemen in reference to the trial of two persons who had been indicted for a riot in the chapel royal. Of this charge he was fully acquitted, to the great disappointment of Mary and the Popish party.

After having continued a widower for more than three years, he married Margaret Stewart, daughter of the good Lord Ochiltree. This marriage took place in March 1564, when he had attained the age of fifty-nine. The noble family with which he thus became connected was descended from Robert Duke of Albany, second son of King Robert the Second. Knox was again brought before the Privy Council, for having, in a sermon preached in St Giles's on the 19th of August 1565, used certain expressions, or rather quoted certain texts, which gave great offence to the king, who was present, and applied them to himself. He was for a short time prohibited from preaching. Early in the following year, Mary subscribed the Catholic league for the extirpation of the Protestants; and if she had not been controlled by several prudential considerations, she seemed sufficiently prepared to adopt extreme measures. When she returned from Dunbar, soon after the death of Rizzio, he retired from Edinburgh, and sought refuge in Kyle; nor does he appear to have resumed his pastoral care till after the final overthrow of her authority. Towards the close of the year he prepared to visit England, where his two sons were residing with some of their mother's relations, for the purpose of receiving their education. He appears to have returned home soon after the queen had plunged herself into ruin by her marriage with Bothwell. He was a member of the General Assembly convened at Edinburgh on the 25th of June 1567; and he preached a sermon at the coronation of the young king, which took place at Stirling on the 29th of the ensuing month. The assassination of the Regent Moray, and the civil troubles which ensued, depressed his mind and affected his health; in October 1570 he felt a stroke of apoplexy, which, however, was of so mitigated a kind that he was able to appear in the pulpit; but his strength was greatly impaired by his unceasing exertions, and he never recovered any considerable degree of vigour. Before the end of that year the freedom of his animadversions in the pulpit gave such deep offence to Kircaldy, governor of the castle, that at length he found it expedient to change his habitation. He quitted the metropolis on the 5th of May 1571, and retired to St Andrews, the scene of his early labours. Here, in the following year, he published *An Answer to a Letter of a Jesuit named Tyrie*. In a state of great debility he returned to Edinburgh towards the end of August 1572; and on the 24th of November he closed his most laborious and most honourable career, after having attained the age of sixty-seven. He left two sons by the first, and three daughters by the second marriage. Both his sons studied at St John's College, Cambridge, and both of them became fellows. Nathaniel, the elder of the two, took the degree of A.M., and died in the year 1580. Eleazar, the younger son, proceeded B.D., and was one of the preachers of the university. Having been collated to

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the vicarage of Clacton-Magna, he died in 1591, and was buried in the college chapel. The three daughters, named Martha, Margaret, and Elizabeth, were married to three clergymen, James Fleming, Zachary Pont, and John Welsh. The widow of Knox became the wife of Sir Andrew Ker of Fadounside, who is described as a strenuous supporter of the Reformation.

The vigorous and ardent mind of Knox was lodged in a diminutive and feeble body, which had been wasted by various hardships, and by intense mental exertion. His natural talents were improved by no mean attainments of learning, and he was eminently distinguished by an impetuous and impressive eloquence, which gave him a great ascendancy among his countrymen. That he was a man of fervent and habitual piety, will not be disputed by any one whose prejudices do not prevent him from forming a correct estimate of his character. From an early period of his life he devoted his entire energies to the best of all causes; and, in the hand of Providence, he was the great instrument which rescued his countrymen from the fangs of papal tyranny and superstition; nor is any other name entitled to be mentioned with equal honour in the annals of Scottish history. Of civil as well as ecclesiastical tyranny he was a decided enemy; and his writings contain some bold speculations on the subject of government. No man was more upright in his intentions, or more disinterested in his motives. That the impetuosity of his character occasionally impelled him beyond the bounds of moderation may be fully admitted without any diminution of the respect due to his name; he was placed in a situation which required great energy and decision; and a person chiefly distinguished by the gentler virtues would have been very indifferently qualified to encounter the boisterous elements with which he was destined to contend. It is not to be concealed that he was not exempted from that spirit of intolerance which, in a greater or less degree, belonged at that period to every sect and denomination of Christians. He was as little disposed to tolerate the mass as the mass-priests were to tolerate those whom they termed heretics. The principles of mutual toleration were little understood or relished; and almost every one who possessed the power, betrayed the inclination of imposing, by very ungentle means, his own creed upon his neighbours.

Beside the works which have already been mentioned, he composed various others, which are accurately enumerated by his biographer. "His practical treatises," says Dr M'Crie, are among the least known, but most valuable, of his writings. In depth of religious feeling, and in power of utterance, they are superior to any works of the same kind which appeared in that age. The thoughts are often original, and always expressed in a style of originality, possessing great dignity and strength, without affectation or extravagance." The work by which he is best known as an author is *The Historie of the Reformation of Religion within the Realm of Scotland*. So early as the year 1586, an octavo edition of it, to the extent of twelve hundred copies, was undertaken in England by Vautrollier, a well-known printer; but when ready, or nearly ready, for publication, it was seized by the command of Archbishop Whitgift. Some imperfect copies, all of them wanting the beginning and the end, have however survived this visitation of the Protestant inquisitor. An edition was afterwards published by David Buchanan, who has taken very unwarrantable liberties with the text. Lond. 1644. fol.; Edin. 1644, 4to. He has suppressed various passages, and interpolated others; and the fifth book, which has not been found in any manuscript, is perhaps his sole composition. A genuine edition, "taken from the original manuscript in the university library of Glasgow," was at length published by Matthew Crawford, professor of ecclesiastical history in the university of Edinburgh. Edin. 1732. fol. A col-

Knutsford lective edition of his works has been edited by David Laing, in 4 vols. 8vo, Edin. 1846-55. (D. I.)

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KNUTSFORD, an ancient market-town of Cheshire, so called, it is said, after Canute the Dane, who forded with his army the stream which passes through the town. Pop. 3127; partly employed in silk and cotton handloom weaving.

KODIAK, or КАДЯК, a large island of Russian America, to the N.E. of the Aleutian group, among which it is sometimes included. It is separated from the mainland of Alaska by the Straits of Cheligoft, and is about 100 miles long by 50 in breadth. The general surface is very mountainous, and in the interior thickly wooded; the valleys are well watered, and the soil and climate are superior to those of the neighbouring islands. The coast, which abounds in whales, seals, &c., is indented by numerous bays; in the N. is the harbour and station of St Paul, the principal fur depôt of these islands.

KOLOMNA, a town in the Russian province of Moscow, on the River Kolomenka, at its junction with the Moskwa, 66 miles S.S.E. of Moscow. It carries on an active trade between Moscow and the neighbouring country, and has manufactures of linen, cotton, silk, and woollen stuffs, leather, tallow, &c. Pop. (1850) 12,598.

KOMORN, or COMORN, a royal free city of Hungary, capital of a cognominal county, is situated on a point of land formed by the junction of the Waag with the Danube, and constituting the eastern extremity of the island of Schütt. The fortress of Comorn, founded by Mathias Corvinus in the fifteenth century, has been rebuilt and strengthened since 1805, and is now one of the strongest in Europe. It has never been taken; and in 1848-9 it successfully resisted all the efforts of the Austrian army. The town itself is irregularly built, and the streets are narrow and dark. It has four Roman Catholic churches, one Greek, one Lutheran, and one Reformed church, a Jewish synagogue, a Roman Catholic and a Protestant gymnasium, and two theatres. Komorn is a steam-packet station, and carries on an extensive trade in grain, wine, timber, and fish. Pop. (1851) 19,113.

KONGSBERG, a mining-town of Norway, stift of Aggerhuus, on the Louven-Elf, 43 miles W.S.W. of Christiania. It is the seat of a mining directory, and has a mining school, a royal manufactory of firearms, and government powder-mills. The silver mines in the vicinity, discovered in 1623, are the most important in the kingdom. Pop. about 4000.

KONIAH, or KONTYEH (the ancient *Iconium*), a city of Asia Minor, capital of the pashalic of Karamania, in a wide plain, about 300 miles S.E. from Constantinople. N. Lat. 36. 54., E. Long. 32. 40. It is surrounded by walls, which are flanked with towers, and by a wide fosse. The walls, about 2 miles in circumference, were built by the Seljukee sultans, in the thirteenth century, of materials taken from more ancient edifices. The figures in *alto relievo* ornamenting the gates are said by Kinneir to be among the finest in Turkey. Koniah now presents little to the eye of the traveller but the ruins of its former greatness. The numerous monuments in the Saracenic architecture fully attest that under the Seljukee sultans it had been a town of great celebrity and sanctity, as well as a seat of learning. There are remains of upwards of twenty *medreschs*, or colleges, a number nearly equal to that of Baghdad. In the modern part of the town the houses are low, and are mostly built of sun-dried bricks and wood. There are several bazaars, mosques, colleges, public baths, and khans, and two Armenian churches. Among the mosques the finest is that of Sultan Selim, built on the model of that of St Sophia at Constantinople. There is here the tomb of a Moslem saint, held in the highest veneration all over Turkey. The manufactures are in a very languishing state, and are confined to carpets and morocco

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leather. Pop. about 30,000. Ibrahim Pasha completely defeated the Turks here on 21st December 1821. See *ICONIUM*.

Konigsberg.

KÖNIGGRÄTZ, a fortified town of Bohemia, capital of a cognominal circle on the Elbe, at the mouth of the Adler, and 6 miles E.N.E. of Prague. It is the seat of a bishop, and has an elegant cathedral, Jesuit's college, episcopal seminary, gymnasium, orphan asylum, large barracks, and theatre. The chief manufacture is woollen cloth. Pop. about 9000.

KÖNIGSBERG, a city and seaport of Prussia, capital of the government of the same name, and of the province of E. Prussia, is situated on both banks, and on an island in the centre of the Pregel, about 4 miles from its mouth. It is divided, exclusive of suburbs, into three parts, originally distinct towns, each with its own magistrates; the Altstadt, or old town, the Löbenicht, both on the N. side of the river, and the Kneiphof, on the island. The two former occupy an elevated site, consisting of seven low hills; the latter is built on piles, the island being swampy. Seven wooden bridges connect the various parts of the city. It is strongly fortified, and since 1843 the fortifications have been greatly increased. The general aspect of the city from a distance is sufficiently imposing, but a nearer view reveals the irregularity and meanness of the streets and the paucity of fine public buildings. The most interesting of the latter is the cathedral, in the Kneiphof, a fine Gothic building of the fourteenth century, containing the monument of Margrave Albert, and the tombs of many Teutonic knights. The palace (*Schloss*), an ungainly but venerable pile, founded in 1257 by King Ottocar of Bohemia, afterwards the residence of the Teutonic grandmasters, and in the present century of Frederick William III. and his queen, when driven by Napoleon from Berlin, is now used as the government house. In the palace church the first Frederick placed the Prussian crown on his own head; the walls are covered with the names of men who fell in the war of 1813. Above it is the Muscovite Hall, 300 feet long, 60 broad, and 19 in height, without pillars or ornament. Near the cathedral is the Albertine University, founded in 1554 by Margrave Albert, having about 50 lecturers and above 300 students; connected with it is a library of about 50,000 volumes, a museum, a botanic garden, and observatory. There are two theological academies, three gymnasia, and a public library of 160,000 volumes. In the *Königsgarten*, or Parade, is a fine equestrian statue of Frederick William III., in bronze, by Kiss. The trade of Königsberg, which has declined in the present century, is chiefly in corn, hemp, flax, linseed, tallow, &c. Amber was formerly an important article of trade; it is still exported in small quantities. There is not depth of water for large vessels nearer than Pillau, at the mouth of the Frisches-Haff, a flourishing place of 4000 inhabitants, about 24 miles from Königsberg. A large proportion of the trade is with Britain. The principal manufactures are woollens, silks, leather, soap, refined sugar, sailcloth, iron and steel ware, &c.; there are also extensive breweries, distilleries, and building yards.

Königsberg ranks third among Prussian cities, being preceded only by Berlin and Breslau. Its foundation is due to the Teutonic Knights, who erected a fort here in 1225. It joined the Hanseatic League in 1365, and was, from 1457 to 1528, the residence of the Teutonic grandmaster. In 1657 it came into the possession of the Elector of Brandenburg, who made it his capital. The Russians occupied it from 1758 to 1764, and the French in 1807, when it suffered greatly. Of distinguished natives of the town the most celebrated was the metaphysician Kant, who never wandered 20 miles from the city during a life of eighty years. His house, No. 3 Prinzessin Strasse, is still shown; his tomb is in a porch outside the cathe-

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Königstein dral. In Latin the town is called *Regiomontum*, or *Mons Regius*.

Koräes.

KÖNIGSTEIN, a small town of Saxony, on the Elbe, 17 miles S.E. of Dresden. Above it, at an elevation of 779 feet from the river, towers the hitherto unimpregnable fortress of Königstein, the retreat, in all cases of extreme danger, of the Saxon monarchs and their treasures. Its strength is due mainly to its lofty and isolated position, the nearest height being 3000 yards distant, as well as to the solid and precipitous nature of the surrounding rock on which it stands. The gateway is high up the cliff, and is approached by a slanting way cut through the rock, and by a wooden draw-bridge. Two years' provisions for 1200 men are always kept stored, in time of war, in vast casemates hollowed out of the rock. There is an inexhaustible supply of water from a well bored in the rock to the depth of several hundred feet, and the plot of land that surrounds the fortress produces some corn and vegetables, and pasturage for one or two cows. The last occasion on which this place became an asylum for distressed loyalty was in 1849, when the king lived here three months. Packing-boxes are kept always ready for conveying the most valued treasures of Dresden to Königstein in case of danger.

KOOM, a town of Persia, province of Irak-Ajemi, an extensive plain 60 miles S. by W. of Teheraun. It was built by the Saracens, about the beginning of the ninth century; it afterwards became one of the finest cities in Persia, and was long celebrated for the manufacture of silks. It was taken, and all but completely destroyed, by the Afghans, on their invasion of Persia in 1722. Part of it has since been rebuilt, but it still has the appearance of a vast ruin. Cloth, cutlery, soap, china, and glass are made here; and the bazaars are large and well supplied. There is a very beautiful and celebrated mosque, erected to the memory of Fatima, the daughter of Imâm Reza, and containing the tombs of Sofi I. and Shah Abbas II. Pop. about 10,000.

KOONDOOZ, a khanat of Independent Turkistan, lying between N. Lat. 35. 38., E. Long. 68. 72., and having N. the territories of Hissar, Durwaz, &c., E. the Bolor Mountains, S. Afghanistan, and W. Bokhara. The greater part of the surface is mountainous, but a considerable portion of it is also marshy, so that in many parts the roads are obliged to be constructed on piles of wood. The marshy parts produce excellent crops of rice, while wheat and barley are largely cultivated in the drier tracts. Fruits are abundant, as are also generally all the necessaries of life. Silk is an important product. The climate, however, is very unhealthy, arising partly from the marshy character of the surface, and partly from the great variety of temperature. The heat in summer is frequently excessive, while in winter the snow lies for three months in the year. The indigenous inhabitants are Tanjiks, but the khan and his dominant party are Usbeks. An active trade is carried on with the Chinese province of Yarkad, and with Bokhara. Slaves constitute a large article of export from Koondooz.

KOONDOOZ, the capital of the above khanat, is situated in a wide valley near the confluence of two rivers, about N. Lat. 36. 48., E. Long. 69. 20. It is a wretched place, of some 500 mud hovels. It has a fortress, surrounded by a mud wall and dry ditch, and a citadel, the winter residence of the khan.

KORÄES, DIAMANTES, or, as he himself used to write his name in French, DIAMANT CORAY, the greatest philologist of modern Greece, and one of the best Greek scholars of his age, was born at Smyrna, April 27, 1748. At a wretched school in his native town, where, as he himself says, the birch and the cane were the only things much in vogue, he picked up a little Greek, French, and Italian. His father, himself a merchant, intended him for commerce, and in 1772 sent him to Amsterdam, to establish there a

branch of his own business. He remained in Holland for six years. On his return home, at the end of that period, he was shocked at the general prostration of Greece and the Greeks under the misgovernment of the Turks. He determined to leave his country, and, in 1782, fixing upon Montpellier in France as his residence, he plunged into the study of medicine. Immediately after graduation in 1788 he repaired to Paris, where he watched with intense interest the progress of the revolution, and dared to hope that his own enslaved country might also be roused to assert its ancient freedom. The design of his writings during many years was to kindle the torch of freedom in Greece itself. To do this three things were needed: to teach the Greeks their own political condition, and bring it under the notice of the other nations; to revive the thoughts and language of their own ancient classics; and to improve the common speech, by purging it of the solecisms which had crept into it in the course of ages. In his own person he united the three functions of political writer, editor of the old Greek classics, and legislator of the modern Greek tongue. The first work by which he made himself widely known was his edition of the *Characters* of Theophrastus, with a translation into French by himself, and some valuable notes and discussions. The work was dedicated to the free Greeks of the Ionian Sea, and the expense of it was defrayed by a rich Greek merchant of Leghorn. The next of his Greek-French works was his edition of Hippocrates' essay on *Climate, Water, and Locality*, which work was immediately translated into German and Spanish, and to which, in 1810, the Institute of France awarded the prize of 5000 francs. In 1802 Coray published a translation into modern Greek of Beccaria's treatise *Dei Delitti e delle Pene* (On Crimes and Punishments), which he dedicated to the newly constituted republic of the seven Ionian Islands. He followed it up next year with his *Mémoire sur l'état actuel de la Civilisation dans la Grèce*, which he published both in French and modern Greek. His aim in doing so was to familiarize the Europeans of the west with the social and moral condition of Greece, and to point out to the Greeks the true means of raising themselves in the scale of nations by a sound system of education. At the instance of Napoleon, Coray undertook, along with Laporte du Thuil and Gosse- lin, a new translation of *Strabo's Geography*. To this important work Coray contributed the third, fourth, seventh, eighth, twelfth, thirteenth, fourteenth, and fifteenth books, and the great body of the appended notes. About this time he contributed important matter, in the form of annotations to Levesque's *Thucydides*, to Larcher's *Herodotus*, and to Schweighäuser's *Athenæus*. In 1804 he conceived the idea of a "Hellenic Library," which should embrace those Greek classics whose works were adapted to the actual condition of the country. The first two volumes contained the complete works of Isocrates. The next six volumes were devoted to Plutarch; and these were followed by Strabo in four volumes. The Strabo of this "Library" contains the best text of that author that has yet been given to the world. During these latter years Coray contributed largely to the columns of the *Logios Hermes* (Scientific Mercury), a Greek journal founded and published at Vienna by Anthimus Gazi. In 1821 the Greek revolution broke out, to the great surprise and even alarm of Coray, who thought the movement premature, and had not looked for it till thirty years later. However, he hailed the dawn of his country's freedom by publishing an edition of Aristotle's *Politics*, and, in the following year, the *Nicomachean Ethics* of the same author. His remaining contributions to the *Bibliotheca Hellenica* were the *Memorabilia* of Xenophon, the *Gorgias* of Plato, and the speech of the orator Lycurgus *Against Leocrates*. Nine less elaborate volumes, which he called *Parerga*, were afterwards added to the *Bibliotheca* by way of supple-

Koräes.

Kordofan. ment. His subsequent works were editions of the first four books of the *Iliad*, of the *Asteia* of Hierocles, and of the *Pastoral Letters of St Paul*, and three volumes of *Atakta*, or Miscellanies. He died at Paris, April 6, 1833, having nearly completed his eighty-fifth year, and having lived long enough to see the independence of his country established and secured on a proper basis.

As a scholar Coray rendered essential service to the literature of ancient Greece, both by giving a powerful impulse to the study of it, and by the large number of happy restorations which he made in the corrupt texts of all the authors edited by him. It has been objected to him, not without reason, that he relied too much on his faculty of critical restoration, and sometimes ignored extant manuscripts of undoubted authenticity. He rendered a no less signal service to the modern Greek, by fixing the rules of orthography and construction. One set of writers, whom he called "the macaronic," with Neophytus Doukas at their head, wished to revive the classic forms. To the great mass of the people their works written on this principle were a sealed book. On the other side, Cathartzi, Christopoulos, and their faction, wrote the modern Greek exactly as it was spoken, and thus prevented it from attaining any literary perfection. Coray took a middle course. He banished all foreign, and especially all Turkish words, and substituted for them words drawn from the literary language, to which he gave modern terminations or forms. The syntax he reconstructed as nearly as possible on the classic model, steering clear of the foreign idioms which had gradually crept in, and avoiding at the same time the affectation of a too severe purism. Time has consolidated Coray's system, and, with some trifling modifications, it is now in general use in Greece.

KORDOFAN, a country of Africa, bounded N. and W. by Nubia and Darfur, E. by Senaar. Mountains and forests to the S. separate it from regions little explored. The general surface is flat, the chief exceptions being in the N. and S., and there is no perennial stream but the Bahr-el-Abiad, which divides it from Senaar. The extremes of temperature are great; the heat in the dry season reaching 122° Fahr. in the shade, while the cold of the nights is severe. During the rainy season, which lasts from April to September, the face of the earth undergoes that rapid and striking change characteristic of tropical countries, the scorched and brown line of the plains gives place to a lively green, and the soil, which seemed hopelessly baked and lifeless, gives forth grass and corn, fruits and flowers. The principal grains cultivated are durrha and sesamum. Among the natural productions, one of the most valuable is the Acacia, producing the finest species of gum-arabic. Among the wild animals are the elephant, rhinoceros, lion, leopard, giraffe, hyæna, antelope, ostrich, &c. The wandering Bedouins rear excellent horses, as well as camels and cows; sheep and goats are bred in great numbers in the hilly country of the south. The inhabitants are chiefly of three races,—negroes, the indigenous race, Arabs so called, and emigrants from Dongola. The last have most of the trade in their hands, and, together with the Arabs, bear no good character for honesty; the aborigines are a simple and hospitable people. The only manufacture carried to any degree of excellence is the tanning of sheepskins. Iron is also wrought to some extent. The most important export is gum-arabic, of which there is a government monopoly, as well as of hides and senna. Cattle, sheepskins, ivory, gold and silver, ostrich eggs and feathers, &c., are also exported. The capital of the country is Obeid, a straggling mud-built place, of about 5000 inhabitants. Kordofan was subdued by Mohammed Ali, viceroy of Egypt, in 1820. It had for some time been subject to Darfur, and previously to Senaar. Before the Egyptian conquest, Obeid is said to have been a place of considerable trade.

KÖRNER, THEODOR, the Tyrtæus of Germany, was born at Dresden in 1791. When a child, he was sickly and feeble, but as he grew up, his whole nature seemed to undergo a complete change. He began to study with intense ardour, devoting himself to history, the physical sciences, and above all to poetry. His father, a man of good station and fortune, enjoyed the personal friendship of Goethe and Schiller. Till his seventeenth year the young Körner had been educated at home. He was then sent to the mining school of Freiberg, and in due time was transferred to the university first of Leipzig, and afterwards of Berlin. In both of these cities he distinguished himself by his enthusiasm for the independence of Germany, and his efforts to rouse his countrymen to throw off the iron yoke of Napoleon. His zeal outran his prudence, and his father judged right to send him for a time to Vienna, where such doctrines might be taught with greater safety. Here he began to write for the theatre. His first two plays, "Die Braut" (*The Bride*), and "Der Grüne Domino" (*The Green Domino*), were completely successful, but were altogether eclipsed by the brilliant triumph of "Rosamonde," "Toni," and above all of "Zriny." When the disastrous issue of Napoleon's Russian campaign restored the prospects of freedom to Germany, Körner volunteered as a private into the Prussian light-horse of Lützow. At the affair of Kitzén, he fought with distinguished valour against the French. Severely wounded in the battle, he crawled during the night into a wood, where he was found next morning by some peasants, who took care of him till he was quite recovered. When he rejoined his corps he was presented with a commission as the reward of his valour. In the constant skirmishes between the French and German troops he exposed his person in the most reckless and daring fashion. At last, on the 26th August 1813, he met the death he had so often seemed to court in vain, being killed by a shot near the village of Wöbbelin in Mecklenburg. He was buried where he fell, at the foot of an oak-tree by the wayside, and his name was carved in the bark. An iron monument now marks the spot.

Körner, at the time of his death, had not completed his twenty-second year, and, in forming an estimate of his poetry, this fact must always be borne in mind. One thought breathes through all his works,—the freedom and independence of the German fatherland, to be wrought out at whatever cost of treasure and blood. Intense hatred to the French, the oppressors of his country, breathes in every line of Körner's lyrics, and these are the poems on which his fame chiefly rests. These lyrics, most of which were written in the camp, were collected into a volume under the title of "Leier und Schwert" (*Lyre and Sword*). The best of them, the "Schwert-lied" (*Song of the Sword*) was written on the field of battle only an hour before he fell. His dramas, though they contain many really powerful scenes, and even some well-drawn characters, are ill-sustained. Many deep thoughts happily expressed, and the general outline of the plots, seem to indicate that, had his life been spared, he might have attained eminence as a dramatist. As it is, his fame will rest mainly on the short pieces which he threw off in the white-heat of a temporary passion.

KOROTSCHA, a town of Russia, government of Kursk, on a small river of its own name, 70 miles S.E. of Kursk. It has a saltpetre manufactory; and carries on a large trade in apples, for which the district is famous. Pop. (1849) 4236.

KOSCIUSKO, THADDEUS, a Polish general, celebrated for his lofty patriotism, was descended of a noble but not opulent family, in the province of Lithuania, and born in 1756. He was educated at Warsaw, and was afterwards sent, at the expense of the state, to finish his studies at Paris. After an absence of several years he returned

Körner
Kosciusko.

home, and became a captain in the Polish army. An unfortunate attachment made it necessary for him to go abroad for a time, and he proceeded to North America, served as adjutant to General Washington in the War of Independence, was decorated with the order of Cincinnatus, and returned to his own country, where he lived in retirement until 1789. About this period he was promoted to the rank of general-major by the Diet, which was then making vain efforts to restrain the influence of foreign powers. Kosciusko was at that time little known; but in 1792 the affair of Dubienka, where with 4000 men he defended for six hours a post attacked by 15,000 Russians, gained him much reputation. He served with equal distinction, during the whole campaign of that year, under the young Poniatowski; but the weakness of Stanislaus rendered fruitless the most generous efforts to maintain the independence of his country. He submitted to the conditions which were imposed upon him by Russia, and under the appearance of a treaty of peace, signed the ruin of Poland. Many of the best officers of the Polish army, Kosciusko in the number, resigned in indignation, and retired to various parts of Germany. When the revolution broke out in Poland in 1794 he was appointed generalissimo of the insurgent patriots, and invested with dictatorial power. Hastily organizing a corps of 5000 men, he marched at their head against the Russians, who were advancing upon Cracow with greatly superior numbers. Destitute of cavalry and artillery, he met the enemy at Wraclawice, and, after a combat of four hours, completely defeated them. This first success produced a general rising; Warsaw was delivered from the presence of the Russians; and Kosciusko soon saw himself at the head of an army of 50,000 men, including about 25,000 regular troops. With this comparatively small force the Polish general-in-chief had to make head at once against the Russians and the Prussians. Frederick William II., who had just failed in his contest with the French, appeared desirous to avenge himself for this affront on the Poles; and, at the beginning of 1794, he marched against Warsaw, at the head of 40,000 men. Kosciusko, who, upon this point, could not oppose to him more than 15,000 men, had nevertheless the courage to attack him at Szezakocin, on the 8th of June 1794; but after a murderous combat, in which he had two horses killed under him, he was obliged to retire to the entrenched camp that covered the capital, where, for two months, he resisted the reiterated assaults of the enemy. At the same time he contrived to keep in order a furious populace, prone to give way to the greatest excesses. Scarcely had he been delivered from the Prussians, in consequence of the diversion which the insurrection of Great Poland operated in his favour, when Kosciusko saw advancing against him the Russian armies under Suaroff and Fersen. It was in vain that he attempted to prevent the junction of these two armies. On the 4th of October, being attacked at Macijowice by very superior forces, he held his ground during the whole day; but at length he sank down pierced with wounds, exclaiming, as he fell, *Finis Poloniae*. As soon as he was sufficiently recovered, he was sent to St Petersburg, where he remained a prisoner of state for two years, and was only liberated on the accession of the Emperor Paul. He immediately set out for England, and thence for America, where he passed several years amongst his old companions in arms. In 1798 he returned to France, where he was received with much distinction, and learned that a great number of his countrymen had enlisted under the banners of the new republic. Those who served in the army of Italy sent him the sabre of John Sobieski, which had been found in the Casa di Loreto. From this time he lived either at Paris or at a country-house which he had purchased near Fontainebleau. When Napoleon was about to invade Poland in 1807, he wished to avail himself of the name of Kosciusko, in the hope of thereby inducing the people of that country to

revolt against the Russians. But the Polish general had too much knowledge and experience not to divine the object for which recourse had been had to him, and positively refused. The address, signed with his name, which appeared in the *Moniteur* in 1806, was a forgery, and was everywhere accepted as such, though it was not till eight years later that Kosciusko was able to give it a public and formal denial. When the Russians penetrated into Champagne in 1814, they learned with surprise that their ancient enemy was living peaceably there. All those who had an opportunity of visiting his retreat testified their regard for him in the strongest manner; and the Emperor Alexander himself had a long interview with the veteran patriot. Nothing could induce Kosciusko to return to his native country. In 1815 he made a tour in Italy, and afterwards established himself at Soleure in Switzerland, where he devoted himself chiefly to agricultural pursuits. His death, which took place on the 16th of October 1817, was occasioned immediately by an accidental fall from his horse. On the news of his demise, the whole of Europe resounded with his praises; amongst all nations, and in every country, justice was equally rendered to the brave soldier and the true patriot, who, without any other object than the independence and welfare of his country, had exposed himself to the greatest perils, and the most painful sacrifices. His remains were interred in the cathedral at Cracow, between those of John Sobieski and of Joseph Poniatowski. See POLAND. (J. B.—E.)

KÖSFELD, KOESFELD, or COESFELD, a town of Prussia, capital of a cognominal circle in the government of Munster, on the Berkel, 20 miles W. of Munster. It is surrounded by old walls, and has a castle, with some manufactures of linen and woollen goods. Pop. (1849) 3607.

KÖSLIN, or COSLIN, a town of Prussia, capital of a cognominal government in the province of Pomerania, on the Niesenbecke, about 4 miles from its mouth, in the Jamund lagoon, which communicates with the Baltic. The town was rebuilt on a regular plan, after its destruction by fire in 1718, by Frederick William I., to whom a statue has been erected by the citizens in the market-place. Köslin is the seat of the superior courts of the government, and has a gymnasium, normal school, a society for the promotion of agriculture, &c. Chief manufactures, linens, woollens, hosiery, and leather. On the Gollenberg, a little to the E. of the town, is a monument to those Pomeranians who fell in the campaigns of 1813–15. Pop. (1849) 8813.

KOSTER, LAURENZ, for whom some claim the invention of printing. See PRINTING.

KOSTROMA, a government of European Russia, lying between N. Lat. 57. and 59., and E. Long. 40. and 48.; and bounded on the N. by the government of Vologda, W. by Jaraslavl, S. by Vladimir and Nijegorod, and E. by Viatka. Area 31,378 square miles. The surface is in general flat, but the soil is not very fertile, being in the N. marshy, while in the S. it is clayey and sandy. The principal rivers are the Volga, and its affluents the Unsha and Vetluga. The climate is severe, but not unhealthy; winter is long and severe, while summer is short and frequently misty. The principal grain crop is rye, but the quantity grown is not equal to the consumption. Large quantities of flax and hemp are produced. The forests are extensive and valuable, principally the property of the crown. The rearing of cattle is little attended to; but the fisheries in the lakes and rivers are actively carried on. Various manufactures are also actively prosecuted in the government, particularly of linen and woollen goods, Russia leather, and brandy. Pop. (1851) 1,020,628.

KOSTROMA, the capital of the above government, is situated at the confluence of the Kostroma and Volga, 228 miles N.E. from Moscow. A wall of earth which surrounded the town has been converted into a promenade. The cathedral is a very handsome building. There is a large bell

Košzegh foundry, several tanneries and manufactures of linens, soap, tallow, &c. Pop. (1854) 13,490.

KÖSZEGH, or GÜNS, a town of Hungary, situated on the slope of a valley, 57 miles S.E. of Vienna. It has an old castle, several upper schools, considerable woollen manufactures, and extensive trade in wine and fruits. It held out nobly in 1532 against the besieging army of the great Suliman. Pop. 8000.

KOTA, in Hindustan, a raj, or native state of Rajpootana, situated between Lat. 24. 30. and 25. 50., Long. 75. 35., and 76. 56. Its area may be estimated at 4339 square miles. The later history of this petty state is somewhat extraordinary. About the year 1771, on the death of a rajah named Goman Singh, the entire powers of the government passed into the hands of a chieftain named Zalim Singh, in the character of regent; the departed rajah having nominated him to this office during the minority of the heir, Omed Singh, then only ten years of age. In 1817 a treaty was concluded between the British government and the state of Kotah, which confirmed the succession to the principality to the son of Omed Singh, but vested the entire administration of affairs in Zalim Singh, by whom it had been so long exercised, and after him in his eldest son, Madhoo Singh and his heirs. It was thus proposed to perpetuate the extraordinary state of things which had accidentally arisen out of the commanding talents of Zalim Singh and the supine indifference of Omed Singh. The results which might have been anticipated followed. The rajah Omed Singh died in 1819, and the dissatisfaction of his successor soon became apparent. In 1824 Salim Singh died. His son Madhoo seems to have inherited no portion of the abilities of his father; and the incongruity of a titular prince, and a servant invested with sovereign power, was now rendered more glaring by the fact, that the latter was an incompetent administrator. To get rid of a system so anomalous, unpopular, and inconvenient, it was proposed by the British government that Madhoo Singh should resign his pretensions to the administration, and receive in compensation part of the territory to be formed into a new principality, and held by him independent of the rajah of Kota. The proposal was at first objected to. At a later period, however, it was revived, and the difficulties in the way of carrying it out surmounted. The more southern part of Kota was assigned to the descendant of Zalim Singh as a separate principality, and the remainder was allotted to the representative of the ancient rajahs of Kota. Kota, the capital of the territory of the same name, is in Lat 25. 10., Long. 75. 52.

KÖTHEN, or CÖTHEN, a town of Germany, capital of the duchy of Anhalt-Köthen, on the Ziehe, and on the Berlin-Bernburg, and Magdeburg-Leipzig railways, 40 miles N.E. of Leipzig. It consists of an old and new town, and is well and regularly built. Among its public buildings are the old ducal palace, where the states hold their sittings, and which has a small collection of pictures, a collection of coins, and a good library; the new ducal palace; the prince's palace; a Lutheran, a Reformed, and a Roman Catholic church, and a Jewish synagogue. It has an institution for noble ladies, founded by Princess Gisela Agnes in 1711, a high school, normal school, and theatre. There are manufactures of linen and woollen stuffs, and some trade in corn and wool. Pop. 6200.

KOTTBUS, a town in the Prussian province of Brandenburg, and government of Frankfort, on the Spree, 42 miles S. by W. of Frankfort. It consists of a walled town and several suburbs, and has an old castle with 4 towers, 4 churches, a gymnasium, orphan asylum, 2 hospitals, and a public library. Manufactures of linen and woollen stuffs, leather, beer, brandy, and paper. It is the capital of a cognominal circle, and the seat of various courts. Pop. (1849) 8978.

KOTZEBUE, AUGUSTUS FRIEDRICH FERDINAND VON Kotzebue. a prolific German dramatist and miscellaneous writer, was born on the 3d of May 1761, at Weimar, where his father was a counsellor of legation. He early evinced a propensity to poetry, and, whilst yet a boy, the representation of a play which he witnessed inspired in him such a love of the drama as determined his future destiny. He received the rudiments of his education at his native place, and when he was about sixteen years of age he entered the University of Jena. Here he remained for one year; but certain family circumstances occurred which induced him to remove to Duisburg, where he studied for a short time at the university, and returned to Jena in the year 1779. He was destined for the profession of the law, but the master-passion predominated; and in gratifying his love of the drama, as well as of literature in general, he consumed no inconsiderable portion of his time. If at this period he did not display great talent, he at least evinced wonderful versatility. Tragedy, comedy, ballads, essays, and other species of literary composition, flowed rapidly from his prolific pen. Their merits, however, he himself confesses in his autobiography, were exceedingly equivocal, although some of his plays were acted with applause. In his nineteenth year, he closed his studies at Jena by taking the character of an opponent at a doctor's degree. Soon afterwards he returned to his native place, where he diligently applied himself to the Pandects, and was admitted as advocate. But his addresses to the muses were still as assiduously paid as ever; and in the ardour of his desire for distinction he tried his skill in almost every species of composition, imitating, as caprice or admiration predominated, all the great writers of Germany, Schiller, Goethe, Wieland, Hermes, and others.

In 1781, on the invitation, it is said, of the Prussian ambassador, Kotzebue went to St Petersburg, where he obtained a situation under Von Bawr, general of engineers. The latter became his warm friend, and recommended him to the empress, who, on the death of Bawr, which occurred about two years afterwards, nominated him a counsellor. His imperial patroness first placed him in a judicial situation at Revel, and finally appointed him president of Esthonia, on which occasion he was ennobled. His literary ambition kept pace with his growing fortunes, and drama succeeded drama from his pen, with great, if not increasing, rapidity. In 1790, on a journey to Pymont, he published his *Doctor Bahrdt with the Iron Forehead*, under the name of *Knigge*; a work which created a considerable sensation at the time of its appearance, but by which he lowered himself not a little in public estimation. Dismissed from the imperial service, he retired for a time to an estate which he possessed at some distance from Narva; but, in 1797, he returned to Weimar, with a pension of 1000 guilders. Three years afterwards, he was induced to pay a short visit to Russia; but he had scarcely crossed the frontiers of the empire when he was arrested by order of Paul I. and sent to Siberia. This treatment of Kotzebue is said to have originated in a suspicion of the autocrat that he was the author of some political pamphlets, in which the emperor was personally attacked; but the exile was kept entirely ignorant of the cause of his banishment. He was, however, shortly afterwards recalled, and, as he informs us himself, well received by the emperor, who confided to his direction the theatre of St Petersburg.

After the death of Paul I. Kotzebue returned to Weimar, and in 1802 was admitted a member of the Academy of Sciences at Berlin. Some disputes which he had with Goethe and the Schlegels induced him to remove to Paris, where the French literati flattered his love of adulation by the attentions which they paid him. It is not much to his credit that he repaid their kindness by the publication of a calumnious work entitled *My Recollections of Paris*.

Kotzebue.

The Italians were treated in the same spirit of illiberality in his *Recollections of Rome and Naples*. About the end of 1803 he commenced, in conjunction with Merakel, a journal entitled *Der Freymüthige*, "The Free-hearted," in which Napoleon was virulently attacked. In 1806 he went again to Russia, and lived from 1807 on his estate in Esthonia, never ceasing to write against the imperial usurper of France. Literature and politics continued to engage the pen of Kotzebue until 1813, when, as counsellor of state, he followed the Russian head-quarters during the campaign of that year; and, in order more effectually to excite the nations against Napoleon, he published in Berlin the Russian-German National Gazette (*Volksblatt*). After the affairs of Europe were decided by the victory of Waterloo, he went to St Petersburg; but was, in 1817, commissioned by the Emperor Alexander to return to his own country, and to report upon the state of literature and public opinion, for which he was to receive a salary of 15,000 roubles. He who had exerted himself so much in favour of Russia, sometimes, it is affirmed, at the expense of his native country, was not likely to be warmly welcomed on his return home. From the first he was looked upon as a spy; and the zeal which he displayed in his new employment soon confirmed this opinion, and prepared the way for his destruction. He established a literary weekly paper, in which judgment was passed on the publications of the day, and political opinions advanced at once dishonourable and obnoxious to Germany, then awakening from its torpor, and heated with the expectation of concessions on the part of its rulers, and by delusive anticipations of representative systems. In his journal Kotzebue steadily ridiculed every attempt to form liberal institutions; and not only was every species of political amelioration opposed, but a marked enmity to the liberty of the press was exhibited. A private communication of his to the Emperor of Russia, which had been obtained it matters not how, was published in a German paper, and republished throughout the country; and its appearance excited a strong feeling of hostility and indignation against the author. Shielded as he was by the power of the autocrat, he found it necessary to quit Weimar for Mannheim, where his literary and diplomatic labours were resumed with increased activity. Unfortunately for him, he began to point his pen more directly against the wild dreams of liberty which were seething in the minds of the great mass of the students at the German universities. A spark of dangerous enthusiasm caught the heated brain of a young fanatic named Sand, who thought that he had done a deed of heroic virtue when, on the 23d March 1819, he deliberately murdered the advocate of tyranny and despotism. The murderer immediately gave himself up to justice, and suffered on the scaffold. Kotzebue, though the contemporary of Goethe and Schiller, was the most popular German author of his day. His fame was gained by his dramas, amounting to about a hundred in number. The best of them are "Die Indianer in England" (*The Indians in England*); "Menschenhass und Reue" (*Misanthropy and Repentance*), which, under the name of "The Stranger," still keeps the stage in this country; "Die beiden Klingsberg" (*The two Klingsbergs*), which has not yet been translated into English, but which Goethe pronounced the best of all Kotzebue's plays; "Der Strassenräuber aus Kindersliebe," else known as *Lovers' Vows*; "Die Spanier in Peru," adapted by Sheridan into English, under the title of *Pizzaro*, and still a stock-piece in the theatres; "Benyowski;" and the "Virgin of the Sun." These plays are of very different degrees of merit; but it may be said that, except perhaps "The two Klingsbergs," not one of them has any permanent value. Kotzebue was in truth not so much a dramatist as a playwright. His great object was to startle his audience. The machinery he employed was pathos worked up to a harrowing pitch of

tenderness, sentiment carried to the extreme of maudlin, and bursts of passion, which even the votaries of the "littérature extravagante" of France would disclaim as overdone. The freshness, or at least the strangeness of his plays, raised him at once to the height of popularity. He dazzled there like a meteor, and for as short a time; and then vanished into the darkness. Kotzebue attempted history, and wrote an extremely bad *History of the German Empire*, and an equally bad *Early History of Prussia*. At the time of his assassination he was in his fifty-ninth year. He had been three times married, and left behind him thirteen children. One of these children, Otto Von Kotzebue, became a captain in the Russian navy, and published an account of a voyage which he made round the world in 1824-26.

KOULI KHAN. See NADIR SHAH.

KOURLAND, KURLAND, or COURLAND, one of the Baltic provinces of Russia, lying between N. Lat. 56. 57. 30., and E. Long. 21. 27., and bounded on the N. by Livonia and the Gulf of Riga, W. by the Baltic, S. by Wilna and Prussia, and E. by Vitebsk; area 10,324 square miles. Along the coasts the surface is flat, with numerous marshes and sandy heaths, but in the interior it is generally undulating. A range of hills runs parallel with the Duna, and sends off ramifications in various directions over the country. The elevations nowhere exceed 500 ft. in height. The principal river is the Duna, which flows along its E. and part of its N. boundary; the principal of the others are the Aa and Vindau. There are numerous lakes and marshes, which render the climate damp and foggy. About two-fifths of the surface is covered with forests, chiefly of pine, fir, birch, alder, oak, and elm. The soil is light and sandy, requiring much manure to render it productive. It is most fertile towards Livonia. The principal occupation of the inhabitants is agriculture, which is in a higher state of perfection here than in any of the neighbouring provinces. Rye, barley, and oats, are the principal grain crops; flax and hemp are also extensively cultivated, and some tobacco is raised. The rearing of cattle is little attended to, and the breeds are inferior. The manufactures are insignificant, with, perhaps, the exception of brandy. The exports, which are considerable, are chiefly corn, flax, hemp, salted meat, and skins. Kourland belonged to Poland till 1795, when it came into the possession of Russia. The inhabitants still enjoy many of their own peculiar rights. Pop. (1851) 539,270).

KOURSCK, a government of European Russia, N., W., S., and E., by Orlov, Tchernigov, Poltawa, Kharkov, and Voronej. Its greatest length, E. and W., is 170 miles, breadth 150; area 17,318 square miles. Pop. (1851) 1,665,215. The general surface is undulating, there is comparatively little wood, and the only considerable rivers are the Sem, a tributary of the Desna, flowing to the W.; and the Donetz, which rises in the S. of the province. The soil is singularly rich, needing no manure; the climate mild, and so dry, that corn is never housed, the grain itself being heaped in pits underground. The agriculture is very primitive; and though the breed of horses is good, oxen alone are employed in the fields. Among the chief crops are wheat, barley, rye, oats, millet, pease, flax, hemp, and tobacco; garden fruits and vegetables are grown in great abundance. The principal minerals are iron, limestone, and saltpetre: fuel is very scarce. Koursk is one of the most populous, as well as fertile provinces of Russia; of the towns besides the capital, the largest are Bielgorod, Karotcha, Putiwl, and Soudja; the face of the country is thickly strewn with villages. With small exception, the universal employment is husbandry: cattle, sheep, and swine, are bred in great numbers, as also are bees.

Koursk, the capital of the government, is built on a tributary of the Sem, 500 miles S. of Moscow. It is a large

Kouli Khan
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Koursk.

Kozloos place, with narrow and dirty streets, and no remarkable buildings. It is the residence of the civil and military governors, and of the Archbishop of Koursk and Bielgorod, and has a considerable trade with St Petersburg and Moscow, exporting cattle, leather, tallow, wax, honey, &c. Pop. (1849) 30,469. A great annual fair is held at a village in the neighbourhood.

KOZLOOS, or **EUPATORIA**. See **CRIMEA**.

KRAIN, or **CARNIOLA**. See **AUSTRIA**.

KRANTZ, **ALBERT**, a celebrated German chronicler, was born at Hamburg about the middle of the fifteenth century. Having finished his studies, he travelled through Western and Southern Europe; and returning to Germany, he graduated at Rostock, and finally became rector of the university of that city. Being recalled to Hamburg, he was provided with a canonry in the cathedral, and divided his time between preaching and teaching theology. Elected syndic of Hamburg in 1489, he took part in the assembly of Wismar, where the interests of the Hanseatic towns were discussed. He was deputed to proceed to France in 1497 to conclude a treaty, and to England in 1499 to solicit assistance against the pirates who then infested the North Sea. In these different missions he evinced so much prudence, sagacity, and integrity, that John King of Denmark, and Frederick Duke of Holstein, chose him, in 1500, to terminate the dispute which had arisen between them on the subject of the province of Ditmarsen. Krantz, having been named dean of his chapter in 1508, laboured with great zeal to remedy the disorders which had been introduced into ecclesiastical discipline; but it is only by a forced interpretation of some passages in his works that Wolf, and after him Bayle, have endeavoured to make him be considered as one of the precursors of Luther. Krantz was witness to the first attacks of that reformer upon the Church of Rome, and warmly condemned them. He died Dec. 7, 1517. Krantz was a very learned man; and the historical works which he left behind him are useful, notwithstanding the errors by which they are disfigured. Some critics have accused him of plagiarism and of bad faith; but he has found numerous apologists, amongst whom may be mentioned Cisner, who places him in the first rank among the writers of his age for truthfulness, as well as elegance of style and clearness of method. His principal works are, his *Chronica Regnorum Aquilonarium, Daniæ, Sueciæ, Norragiæ*, Strasburg, 1546, in folio; *Saxonia, sive de Saxoniciæ Gentis vetusta origine, longinquis expeditionibus susceptis, &c., libri xii.*, Cologne, 1520, in folio; *Vandalia, sive Historia de Vandalorum vera origine, variis gentibus, crebris e patria migrationibus, &c.*, Cologne, 1519, in folio; *Metropolis, sive Historia Ecclesiastica Saxoniciæ*, Basil, 1548, in folio; and some other works of little importance. (J. B—E.)

KRASNOE, a Russian village, 30 miles S.W. of Smolensk, near which the French, in the retreat of 1812, lost, during three successive days, 25,000 men, several thousand prisoners, and twenty-five pieces of cannon.

KRASNOE-SELO, a small town of Russia, 18 miles S.S.E. of St Petersburg. There is an imperial palace here, and in summer troops from the capital are often encamped in the neighbourhood.

KRASNOE-YARSK, a town of Siberia, capital of the government of Yenisei, on the river of that name, 290 miles E.S.E. of Tomsk. It is situated in the midst of a very fertile district, and has a considerable trade in agricultural produce and Chinese goods. There is a large leather and coach manufactory, in which convicts are employed. Pop. 6472.

KREMENTSCHUK ("The City of Fire-stones"), a town of Russia, government of Poltava, on the Dnieper, 70 miles S.W. of Poltava. It has a considerable trade, and manufactures of sugar, liqueurs, soap, saltpetre, &c. Pop. 17,074.

KREMnitz, a royal mining-town of Hungary, county

of Bacs, 88 miles E.N.E. of Presburg. It is situated in a deep and gloomy valley, and contains an old fort, a mint and mining directory, a gymnasium and other schools, with some manufactures of vitriol, paper, earthenware, and vermilion. To the mint of Kremnitz properly belongs the coinage of all the gold and silver of Hungary. The neighbouring mines yield annually about 180 lbs. troy of gold, and 11,000 lbs. of silver, besides copper, lead, and cobalt. The richest veins, which are now nearly exhausted, belong to private companies. Pop. about 6000.

KREMS, a town of Lower Austria, in a picturesque valley at the confluence of the Krems with the Danube, 37 miles W.N.W. of Vienna. It has a Piarist convent, gymnasium, theatre, &c., and manufactures of mustard and gunpowder. Pop. 6537.

KREUTH, a small but fashionable watering-place of Bavaria, about 40 miles S. of Munich. Its situation is highly romantic, at an elevation of 3000 feet, hemmed in by mountains wooded to the summit. The waters are sulphureous; goats' whey and an infusion of mountain herbs are also much used medicinally.

KREUZNACH, a town of Rhenish Prussia, on the Nahe, 40 miles S.S.E. of Coblenz. It is picturesquely situated in a fertile district, irregularly built, with many old houses; and has manufactures of woollens, leather, tobacco, soap, &c. In the neighbourhood are extensive salt-works, and the saline springs attract a considerable number of visitors. Pop. (1846) 9383. This place was stormed by Gustavus Adolphus in 1632.

KRONSTADT. See **CRONSTADT**.

KROTOSZYN, a town of Prussia, province of Posen, on the Silesian frontier, 55 miles S.E. of Posen. Pop. (1846) 8049, employed in manufactures of woollen and linen, leather, tobacco, brandy, &c.

KRUMHORN, an old musical instrument of the cornet kind. Organ-builders, corrupting the name into *Cremona*, have wrongly applied this to one of their reed-pipe registers.

KUBAN, or **KOUBA**, a river of Russia. See **CAUCASUS**.

KULM, a village of Bohemia, at the foot of the Nollendorf Pass in the Erzgebirge, about 2 miles N. of Töpliz. An obstinate and decisive battle was fought here, August 30, 1813, between the French under Vandamme and the allied forces under Count Colloredo Mansfeld, ending in the utter rout of the former. Three monuments commemorate the victory.

KUR (the ancient *Cyrus*), the principal river of Georgia, Western Asia, rises in a branch of the Caucasian Mountains, a little to the N.W. of Kars, about N. Lat. 41., E. Long. 42. 30. It has a northerly course through the Turkish dominions, and to within about 60 miles of Tiflis, when it turns suddenly in a S.E. direction, and, after passing that city, empties itself by several mouths into the Caspian. It receives the waters of the Araxes about 70 miles from its mouth, and becomes navigable for small vessels. Its length is estimated at about 520 miles.

KURDISTAN, or **KOORDISTAN**, an extensive tract of country in Western Asia, belonging partly to Persia and partly to Turkey, and comprising a large part of the high table-land which stretches southwards from Armenia to the basin of the Tigris. The name signifies the "Land of the Kurds or Koords;" and as that people have spread on all sides from the original cradle of their race, the name is often loosely applied to a greater extent of country than is strictly correct. Kurdistan proper lies between N. Lat. 34. and 39., and E. Long. 42. and 47. Its area may be computed at between 40,000 and 50,000 square miles. The northern and southern portions of Kurdistan present completely distinct geographical features. The first is almost wholly occupied by mountain ranges running nearly parallel from N.W. to S.E. The Soli chain stretching from

Krems
Kurdistan.

Kurdistan.

the city of Jezireh, near the Tigris, right across the country to the Persian frontier. It is low at first, not rising higher than 1000 feet. In the middle of its course, where it takes the name of El Khair, it reaches the height of 3000 feet, and continues to rise till it reaches the confines of Persia. Between this ridge and the Armenian frontier is the lofty plateau of Ali-Bagh, varying from 4000 to 7000 feet in height, and intersected at rare intervals with valleys. During the scorching heats of summer the shepherds drive their flocks from the low grounds to this table-land, which affords a scanty pasturage. Between the El Khair Mountains and the Persian boundary the mountains rise higher, and the valleys, though still very narrow, become deeper. Some of the peaks attain a great height; the highest, Jawar-Tagh, is said to be nearly 13,000 feet above the sea. The southern portion of Khurdistan possesses large tracts of low and level lands. Three ranges of low hills diversify the surface, but only on the side of Persia can it be considered mountainous. These ranges are Kara-Tagh on the N.E.; Ali Tagh in the centre; and the Hamrin Hills on the S.W. The principal rivers in Khurdistan are the Zab-Ala or Great Zab, the Zab-Asfal or Lesser Zab, and the Diyalah. The first of these, rising in the Ali-Bagh, drains a great part of Northern Khurdistan, and, flowing past the Kara-Tagh, falls into the Tigris, a little way below Mosul. The Zab-Asfal rises on the borders of Southern Khurdistan and Persia, and, flowing in a course nearly parallel with the Great Zab, joins the Tigris about 50 miles further down. The Diyalah falls into the Tigris about 30 miles above Baghdad.

The climate of Khurdistan ranges between the extremes of heat and cold. In summer the heat is intense, especially in the S. In winter, the cold in Northern Kurdistan is quite unendurable. On many of the mountain-tops snow remains for six months of the year. The plains produce in abundance the ordinary cereals and vegetables of Europe; and the finest fruits grow in profusion in the orchards. Melons, cucumbers, and other gourds, in especial attain an immense size. In the low grounds near the Tigris, tobacco, cotton, rice, and millet are raised in large quantities, chiefly for exportation. The sides of the lower mountains are covered with forests of oak, walnut, and other hardwood trees. Immense quantities of gall-nuts are gathered, and form a valuable article of commerce. Another important article is the manna found in large quantities on the leaves of the dwarf oak, tamarisk, and other shrubs. Bears, wild boars, goats, and deer abound in the forests, but birds, except partridges and quails, are scarce. Bees are numerous, and their honey is eagerly sought after for purposes of trade. Of domestic animals the horse is the most valuable. It is used solely for riding, and is in great request for the Turkish and Persian cavalry. The ox is the chief beast of burden, a very few camels only being used. The sheep are very numerous, and their fleeces yield wool of very fine quality. Minerals are scarce. Some iron and sulphur are found in Northern Kurdistan, and there are numerous salt-springs in the S. Naphtha and petroleum are also abundant. Korkuk in Northern Kurdistan is the chief centre of commerce, which is carried on mainly with Baghdad and Persia by means of caravans.

The Kurds were known to the ancients under the name of Carduchi. (See CARDUCHI.) They were originally subject to the Persians; but after the era of Alexander were incorporated with Syria. In the third century B.C. they were dissevered from that kingdom by the Parthians, and, on the destruction of the new Persian kingdom, passed to the caliphate of Baghdad. In 1258 Kurdistan was conquered by the Moguls, and, 130 years later, by the Tartars, under Tamerlane. In the beginning of the sixth century Kurdistan once more became subject to Persia. They continued faithful to their new masters for about a century, but

being oppressed by them, revolted and attached themselves to the Turkish sultans. At the present day about three-fourths of the country are subject to the Porte, and are comprised within the eyalets of Baghdad, Mosul, and Van. The remaining fourth belongs to Persia, and forms the province of Kurdistan, of which the capital is Kermanshah. The number of Kurds in Kurdistan and the adjoining countries is estimated at from 2,000,000 to 2,500,000. Most of them are Mohammedans; but a good many Nestorian Christians are found among them.

KURILE ISLANDS, a chain of islands in the Pacific Ocean, extending from the Kamtschatka southward to the larger islands that form the Japanese empire. They are twenty-five in number, and are claimed by Russia, with the exception of the three southernmost, which belong to Japan. They are all of volcanic origin, and contain a number of active volcanoes. The surface is very irregular, some of the elevations rising to the height of nearly 6000 feet. The coasts are abrupt and difficult of access, and the seas are subject to violent and sudden tempests. The climate is severe and foggy. Agriculture is not attended to, except on those islands which belong to Japan. The inhabitants employ themselves in fishing and the chase, the produce of which they dispose of to American, Dutch, Russian, and Japanese traders. Area estimated at about 3000 square miles.

KURNUL, in Hindustan, a British district in the Presidency of Madras, bounded on the N. by the River Kistnah, on the E. and S. by Cuddapah, and on the W. by Bellary, containing an area of 2643 square miles, with a population of 273,190. Towards the close of the year 1838, while the British were planning the expedition for the restoration of Shah Shujah to the throne of Cabul, information reached them that military preparations upon an extensive scale had been carried on for some time by the Nawaub of Kurnul. An investigation followed, the result of which left no doubt that the Nawaub was one of the originators of a wide-spread Mussulman conspiracy for the subversion of British rule in India; its development merely awaiting a fitting opportunity, which it was anticipated events in the N.W. would afford. Recourse to arms became necessary. No difficulty was experienced in obtaining possession of the capital, but the Nawaub, with several of his followers, withdrew from the place. A force was despatched in pursuit, which, after a sharp encounter, succeeded in securing the person of the Nawaub, as well as several other prisoners. An immense quantity of warlike stores was found in the town. No satisfactory explanation could be given for the accumulation of so vast a quantity of the *matériel* of war, or for the systematic disguise and concealment under which it had taken place; and as the obvious conclusion was, that the Nawaub's proceedings were connected with plans for the subversion of the paramount power, it was justly thought that the chief had been guilty of a breach of allegiance, and his territory was annexed to the British dominions. The Nawaub was shortly after assassinated by one of his Mohammedan followers.

KURRACHEE, in Hindustan, is a sea-port of Sind, situate on the western coast of that country. At the entrance of the harbour is a bar, having one fathom and a quarter of water when the tide is out, and consequently cannot be safely crossed by ships the draught of which exceeds 16 feet. It is stated, however, that from the beginning of September to the end of May vessels of 800 tons can always enter the harbour at high water, while the roads outside the bar are perfectly safe during the same period for vessels of any size. The town is distant 3 miles from the landing-place when the tide is out, but it has been rendered easy of access by the formation of a mole and road. In 1853 the town and suburbs contained a popula-

Kurile
Islands
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Kurrachee.

Kussier
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Küster.

tion of 22,000 souls. Kurrachee is the safest port of India. In a commercial point of view, it has been defined the gate of Central Asia, and is likely to become to India what Liverpool is to England. This town is about to be connected with the River Indus, probably at or near Hyderabad, by means of the Sindé Railway, and with Europe, by means of the electric telegraph and the Euphrates Valley Railway. Lat. 24. 51., Long. 67. 2.

KUSSIÉ, a Turkish musical instrument, consisting of five strings, stretched over a skin that covers a kind of basin.

KUSTENDJI, or KOSTENDJE (the ancient *Constantiana*), a fortified sea-port town of European Turkey, Bulgaria, on the Black Sea, at the E. extremity of Trajan's Wall, 40 miles E. of Kassova. It has some trade in corn, but the harbour is exposed, and not suited for large vessels. Pop. about 5000.

KÜSTER, LUDOLF, one of the best scholars and most learned men of his age, was born in 1670 at Blomberg in Westphalia. After studying at Berlin, he became, while still a very young man, tutor to the sons of the Count Von Schwerin, prime-minister of Prussia, and afterwards travelled through England, France, and Holland. In all these countries he formed friendships among the most eminent scholars of the day. As an author he first became known in 1696 by his *Historia Critica Homeri*, which was reprinted in 1785 by Wolff in his History of Homer and his Writings. Settling at Utrecht for a few years, he read lectures there publicly, and contributed to Gronovius' *Thesaurus of Greek Antiquity*, and to Grævius' *Thesaurus of Roman Antiquities*. He also set on foot a Latin periodical, under the title of *Bibliotheca Librorum Novorum Collecta a L. Neocoro*. Neocorus was the Greek equivalent for Küster, which means *sexton*, and had been given to him playfully by Grævius, in accordance with a practice common in that age. In 1700 he passed over to England, intent on bringing out a new edition of *Suidas*. In five years he had completed his task, which appeared at Cambridge in 1705 in 3 vols. folio. This work gave him a high rank among critical scholars, and he worthily maintained it by his edition of Iamblichus' *Life of Pythagoras*, Amsterdam, 1707, and, above all, by his splendid edition of *Aristophanes*, published in the same town in 1710. During his residence in that city, his *Suidas* was reviewed in a very ill-natured spirit by his old friend Gronovius. Küster replied in his *Diatrise Anti-Gronoviana*, and silenced his critic, whose remarks had been dictated chiefly by a spirit of splenetic jealousy. To his *Diatrise* he appended a learned essay on the "æs grave" of the Romans; and another, no less learned, on the verb "cerno," which he gave out as a specimen of new *Thesaurus* of the Latin tongue on which he had been engaged for some years. These dissertations involved him in an obstinate controversy with Perizonius, which, to the surprise of all, was carried on with perfect gentleness and moderation on both sides. Removing to Paris in 1713, Küster became a member of the Academy of Inscriptions, and received from Louis XIV. a pension of 2000 livres. Unfortunately he did not live long to enjoy his new honours, as he died in Paris in 1716. Though he was an admirable Latin scholar, it was

Küstrin
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Куyp.

chiefly as a Hellenist that Küster was conspicuous among the great scholars of his age. Greek was his favourite study, and he attained a mastery over that tongue such as was equalled by few, if any, of his contemporaries.

KÜSTRIN, a fortified town of Prussia, province of Brandenburg, at the junction of the Wartha with the Oder, which is here crossed by a bridge 875 feet in length, 16 miles N. of Frankfort. The town is surrounded by lakes and marshes, which greatly add to its strength. It contains a castle in which Frederick the Great was confined by his father. The manufactures comprised woollens, hosiery, leather, starch, brandy, and bear. Küstrin was taken by the French in 1806. Pop. (1849) 8310.

KUTAHIAH, or KUTAYA (the ancient *Cotycæum*), a town of Asiatic Turkey, pashalic of Anatolia, at the foot of the Pursak Mountains, and on the river of that name, 180 miles N.E. of Smyrna. N. Lat. 39. 25., E. Long. 29. 45. The town is large and populous, and has numerous mosques, public baths, fountains, and khans. On a projecting point of a hill, rising above the town, is an ancient castle. The surrounding country is well watered and fertile, producing grain, cotton, gall-nuts, and fruits, which, with wool and goats' hair are important articles of trade. Kuthiah is noted as the centre of that tract where the famous Turkey carpets are manufactured.

KUTTENBERG, a mining-town of Bohemia, circle of Czeaslau, 38 miles E.S.E. of Prague, on the railway between that city and Vienna. The inhabitants are chiefly dependent on the mines, which have been long worked, and yield silver, copper, lead, arsenic, and zinc, but are much less productive than formerly. Some cotton and woollen stuffs are manufactured, and starch is made. The parish church is a fine Gothic edifice. Pop. (including suburbs) about 10,000.

KUYP, or CUYP, ALBERT, one of the best landscape painters of the Dutch school, was born at Dort in 1606. Of his personal history nothing else, not even the date of his death, is known. His father, Jacob Gerutze Kuyp, was himself a distinguished painter; and though Albert Kuyp adopted a very different manner, and attempted a wider range of subject, it was in his father's studio that he received his art training. For a very long time he was extremely ill-appreciated in his own country, and was scarcely known abroad even by name. England was the first country to discover and rightly value his merits, which are now universally acknowledged. The numerous specimens of his art in all the leading English galleries, private as well as public, show how great a favourite he is in that country. According to Waagen: "In loftiness of conception, knowledge of aerial perspective, with the greatest glow and warmth of the serene atmosphere, Kuyp stands unrivalled, and may justly be called the Dutch Claude. In the impasto, the breadth and freedom of execution, he greatly resembles Rembrandt." It is no doubt on his landscapes that Kuyp's fame chiefly rests, yet his cattle groups and (though perhaps in a less degree) his sea pieces, are in their several ways equally excellent. Dr Waagen, in his *Art-Treasures of Great Britain*, criticizes specially the numerous masterpieces of Kuyp which he found in the various public and private collections.

L.

L
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Labadie.

L, A semi-vowel or liquid, forming the twelfth letter of the alphabet. It is derived from the old Hebrew lamed, or Greek lambda. In the ancient Greek, the Celtic, and the Etruscan alphabets, the letter is formed by two straight lines making an angle with each other, but sometimes placed horizontally, and sometimes vertically. The Brazilian and Japanese alphabets are said not to possess the letter at all. It is sounded by intercepting the breath between the tip of the tongue and the fore part of the palate, with the mouth open, and makes a sweet sound, with something of an aspiration; hence the Britons and Spaniards usually doubled it, or added an *h* to it, in the beginning of words, as in *llan*, or *llhan*, a temple, sounding nearly like *fl*. Amongst the Ionians the letters *r* and *l* were frequently interchanged. The Romans often put *l* for *r* in words taken from the Greek, as the Italians have done in words taken from the Latins, *e. g.*,—*balathro* from *barathron*, and *pelegrino* from *peregrinus*. In the derivative languages of more modern times we find *l* of the original language disappearing in numerous instances, and its place supplied by other letters. Of these may be mentioned *d, i, n, u*. For example, *admiral* (English) from *almirante* (Spanish), *piaga* (Italian) from *plaga* (Latin), *Bologna* (Italian) from *Bononia* (Latin), and *autre* (French) from *alter* (Latin.) In French, *ll* after *ai, ei, oui*, as in *travailler*, &c., is pronounced nearly the same as our *y*. The same remark applies to the Italian *gl* before *i*, as in *egli*. In Spanish, *ll* is liquid, as in the foregoing case, and, as in the Welsh, may be placed at the beginning of a word, *e. g.*,—*llaneros*. In English words of one syllable it is doubled at the end, as *tell, bell, knell*; but in words of more syllables than one it is single at the end, as *evil, general, constitutional*. It is placed after most of the consonants in the beginning of words and syllables, as *black, glare, adle, eagle*, but before none. Its sound is clear in *Abel*, but obscure in *able*, and the like.

As a numeral letter, L denotes 50; and with a dash over it thus, *L̄*, 5000. Used as an abbreviation, this letter stands for Lucius. (See ABBREVIATIONS.) LA is the syllable by which Guido denotes the last sound of each hexachord. If it begins in C, it answers to our A; if in G, to E; and if in F, to D.

LAALAND, or LOLLAND, an island of Denmark, in the Baltic, between N. Lat. 54. 38. and 54. 58., E. Long. 10. 56. and 11. 50. It is about 60 miles in length from E. to W., by about 20 in breadth, and has an area of 462 square miles. The surface is low and flat, and in many parts marshy. The principal lake, that of Marieboe, near the centre of the island, is about 5 miles in length. The soil consists chiefly of a heavy loam, and produces abundant crops of corn, flax, hops, potatoes, &c. Woods of excellent timber occur in the island. Pop. about 55,000.

LABADIE, JEAN, the founder of the sect of the Labadists, was born in 1610, at Bourg, in Guienne, and was educated at the Jesuit college of Bordeaux. Expelled from the Catholic church for the gross profligacy of his life, he joined the Protestants, and settling at Montauban, preached for eight years there with great success. His immoralities again threw him upon the world, and he sought an asylum first at Orange and afterwards at Geneva. The assumed austerity and sanctity of his life gained him many followers, and when, in 1666, he exchanged Geneva for Middleburg, the number of his devotees was greatly

Labarum
||
Laberius.

increased. Refusing to acknowledge the synod of Dort, he was formally deposed; and retiring to a little village near Amsterdam, he set up a printing press, and published many works of a half insane, half mystical import. His besetting sin again drove him forth from this retreat, and taking refuge in Altona, he died there in 1674, at the age of sixty-four.

According to their own declaration in their "Confession," the Labadists did not entirely abandon the reformed cause, but still continued to hold the symbolical books. They were a sect of ascetic mystics, who wished reform of life rather than of doctrine. From their belief in the nature of church-membership they were compelled to form an isolated class, and naturally fell into the practice of having property in common. They rejected infant-baptism, and the observance of holy days. Although not guilty of the immoral practices often imputed to them, they fell to pieces in the first half of the 18th century. Hund, Pauli, and Calovius wrote against them. (See *Histoire de la vie de J. de Labadie*, Hague, 1670.)

LABARUM, a military standard of the Roman empire. It consisted of a long lance, crossed at right angles near the top by a staff, from which hung a small flag or streamer of purple cloth inwrought with gold and precious stones, and bearing the effigy of the emperor. Constantine the Great, when he embraced Christianity, substituted for that device a crown, a cross, and the initial letters of the name Jesus Christ, and made it the imperial standard. (Prudent, in *Symmach.* l. 466; Niceph. *H. E.* vii. 37.)

LABEO, C. ANTISTIVS, a celebrated lawyer of the age of Augustus and Tiberius, was son of Antistivs Labeo, who formed one of the conspiracy against Cæsar, and after the unsuccessful battle of Philippi caused himself to be put to death by one of his own slaves. His son seems to have inherited all the independent principles of the father, and to have expressed at times his opinions respecting the measures of Augustus with such freedom, that it was thought by his friends that he was subject to fits of insanity. (Hor. *Sat.* i. 3, 82; Suet. *Aug.* 54.) Some say that he was offered the consulship by Augustus, but that he refused the honour, lest he should be suspected of having sold his independence to the emperor. Others say that he was a candidate for the consulship, and that Augustus caused M. Ateius Capito to be elected in preference to him. (Tacit. *Ann.* iii. 75.) He had applied himself more particularly to the study of law, and left many works, of which scarcely anything remains except the title; eight books on *Probabilities*, of which Julius Paulus made an abridgement; a work in forty-two books, entitled *Posterioriores*, because it appeared after his death. Of these two works fragments are to be found in the *Pandects* of Justinian. The latter is abridged by Jabolenus, who flourished under Trajan. (Gell. xiii. 10.) His other works are,—*Commentaries on the Twelve Tables, and on the Edicts of the Prætor and Curile Ediles; a Treatise on the Prætor Urbanus and Peregrinus; a Treatise on Pontifical Law*, in fifteen books. It is disputed whether some other works mentioned by St Augustin belong to this Labeo, or to another of the same name. (See *Opuscula varia* of Bynkershœck, Leyd. 1719; *De Vita, Moribus, et Studiis Labeonis et Capitonis*, Utreght, 1692.) (C. T. R.)

LABERIUS, DECIMUS, a Roman knight, who was par-

La Borde
||
Labrador.

ticularly distinguished as a writer of *mimi*, that is, farces in the language of the common people, and for their amusement. The exact period of his birth is unknown, but he died B.C. 43, a few months after the murder of Cæsar. Having caused some annoyance to the dictator by the freedom of his language, he was ordered by him to appear on the stage as an actor in one of his own plays, when he had reached the age of sixty. The prologue which he pronounced on this occasion is preserved by Macrobius (*Stat.* ii. 7), and is so beautiful that it makes us regret that more of his writings have not come down to us. When he had finished, he proceeded towards the places assigned to the knights; but his appearance on the stage had deprived him of all the privileges enjoyed by that order, and no one was willing to make way for him. Cicero, observing his embarrassment, said, in allusion to the number of new senators admitted by Cæsar, "Recepissem te nisi anguste sederem;" upon which Laberius sarcastically replied, "Mirum si anguste sedes qui soles duabus sellis sedere," thereby reproaching Cicero with his versatility of conduct. We have the titles of forty of his pieces (see Fabricius *Biblioth. Lat.* i., p. 477), but only a few fragments of them have been preserved. They have been published by Stephanus, Paris, 1564; and are also found in the *Catalecta veterum Poetarum* by Scaliger, and in the *Epigrammata vetera*, Lyons, 1596.

(C. T. R.)

LA BORDE, JEAN BENJAMIN DE, author of the great *Essai sur la Musique Ancienne et Moderne*, was born at Paris in 1734. His family was immensely wealthy. Instead of entering upon active life, as it had been intended that he should, he attached himself to the court, and became *premier valet de chambre* of Louis XV. He became a great favourite with that prince, and more than once brought himself to the verge of ruin by sharing in his costly pleasures. All the time that he could steal from his court duties was gladly devoted to music and the fine arts, of which he was passionately fond, and in which (especially music) he was deeply versed. On the death of Louis XV. La Borde became one of the farmers-general, and the immense revenues of his office enabled him to repair the fortunes he had squandered in his youth. He married, lived quietly, and spent all his spare time in study. One of the first fruits of his labours was his *Essay on Music*, in 4 vols. 4to., 1780. Next year he published a kind of continuation of this work under the title of *Mémoire sur les proportions Musicales, le genre Enharmonique des Grecs et celui des Modernes*. He brought out in a very splendid style several other works bearing on history, chronology, and geography. But these are for the most part mere compilations. In writing his *Essay*, La Borde derived valuable aid from the Abbé Roussier. The best part of the *Ancient History of Music* is his, and the sections assigned to the theory of the art among the Greeks are wholly so. Though somewhat unequal, and quite wanting in unity of design, the *Essai* contains a mass of information so carefully collected and so ably sifted as to be still on many points a final authority.

When the Revolution broke out, La Borde, like all the officials of his class, was obliged to flee for his life. He retired into Normandy, where he lived for some time without being recognised. An unlucky accident discovered his retreat. He was seized, taken to Paris, and there thrown into prison. He might have escaped had he acted prudently, but he insisted on being tried without delay. His trial resulted in his condemnation, and he perished on the scaffold on the 22d July 1794.

LABRADOR, a large peninsula of North America, nearly of a triangular shape, extending from N. Lat. 50. to 63., and from W. Long. 56. to 79. It is bounded on the S. by Canada and the Gulf of St Lawrence, E. by the Atlantic Ocean, N. by Hudson's Straits, and W. by Hudson's

Bay. Labrador is thus detached from the arctic lands, but is nevertheless a country as frozen, desolate, and barren, as those to the W. of Hudson's Bay. The coast along that spacious inland sea is called East Main, and the climate there is peculiarly rigorous. The whole surface of Labrador, indeed, is as sterile and naked as any part of the globe. The prevailing features are rocks, swamps, and water; and vegetation appears as the last effort of expiring nature. Small scraggy poplars, stunted firs, creeping birch, and dwarf willows, thinly scattered in the southern parts, constitute the whole of the trees; herbs and grass are also in sheltered places to be met with; but in the most northerly parts only varieties of moss and lichens are to be found. The whole of the interior, from the aspect of what has been explored, and from the reports of the Esquimaux and other Indians, seems to be broken up with rivers, lakes, and rocks. The prevailing rock contiguous to the sea-shore of Labrador is gneiss. On this, at L'Anse à Loup, the most fertile part of the country, a bed of old red sandstone, about 200 feet thick, is superimposed, and extends about half a mile inland. Here also, as on other parts of the coast, the appearances of the cliffs and of the land near them, and the rolled masses inland, which have evidently been exposed to the action of the sea, seem to prove that the latter has considerably receded. The sandstone is generally red and white in alternate strips, and presents a remarkable mural front to the sea. Near the surface it is strongly marked with iron. The whole of the rock is composed of white quartz and yellow felspar; and the grains, though generally as fine as oatmeal, are occasionally coarser, even to the extent of half an inch in diameter. Over the red sandstone is a thin stratum of red compact felspar, containing vegetable impressions, and also horizontal. Above this are varieties of secondary limestone, arranged in parallel strata several feet thick and full of shells. Detached masses of primitive limestone are also found; and, a few miles from the shore, the secondary formations generally disappeared, leaving gneiss and mica slate on the surface. N. of Cape Charles, on the Labrador coast, the land falls back to the westward, and the shore changes its character, becoming shoal, and running off in flats; whereas to the southward it is bold and abrupt. The prevailing rock, however, is still gneiss, containing numerous veins of granite, from a few inches to many feet in thickness, the constituent parts being mica, quartz, and felspar. The diameter and dip of the gneiss rock is here, as elsewhere on the coast, to the north-west, and at an angle of nearly 65°. It is coarse and dark, hornblende taking the place of mica, and frequently very light-grayish felspar forming the chief constituent. Where this occurs, the face of the hill has a remarkably spotted appearance. On one of the islands which here skirt the coast a large bed of primitive greenstone was found, forming a range of hills resting on the gneiss, and appearing to have the same direction. On the western part of these islands also the gneiss gives place to mica slate, this commencing beyond the above-mentioned range of greenstone, which appears to mark the line of demarcation between them. The mica slate then predominates through all the islands and shores examined to the westward of this point, viz., to the Mealy Mountains, in Sandwich Bay, a distance of about 35 miles. In some places crystals of garnet are very abundant in it, and in others considerable beds of granite are found, of a confused appearance, and in which quartz and felspar predominate. The Mealy Mountains are the highest land on this coast, and are computed to be about 1484 feet in height, covered nearly to the top with wood, notwithstanding the severity of the climate. They are of mica slate, with a dark, fine-grained formation of the same, resembling basalt, at their base. The general rock is coarse-grained. At the foot of these mountains are also found beds eight and ten feet thick, and large rolled masses

Labrador.

Labrador. of a remarkable conglomerate rock, of which the basis is composed of grains of mica, quartz, and felspar; and the imbedded masses are large rounded pebbles of quartz, mica slate, felspar, hornblende, granite, and gneiss. The whole is very hard, eliciting sparks of fire under the stroke of the hammer. The imbedded fragments are all water-worn. On the island of St Paul is found the beautiful mineral Labrador felspar, associated with hyperstene, hornblende, and magnetic iron.

The general aspect of different parts of the Labrador coast has been described by the Moravian missionaries, from whom we learn that Nullatarlok Bay, in N. Lat. 59., is surrounded by high mountains, which are covered with moss, alder, birch, and various shrubs and plants, the valleys in July being grassy and enamelled with a great variety of flowers. The rocks are slaty, easily splitting into plates of from four to eight feet square. At Nachvak Bay the sea was clear of ice in the middle of July, and the magnificent mountains around afforded to the missionaries a most enchanting prospect. Oppernavik, lying between N. Lat. 60. and 61., is not far distant from Cape Chudleigh, where the coast, which was hitherto N., now trends to the S.S.W., embosoming a spacious expanse of water called Ungava Bay. The River Kangerluksoak, in N. Lat. 58. 57., is about 140 miles S.S.W. of Cape Chudleigh. The estuary of the Koksoak lies in N. Lat. 58. 36., at the distance of about 650 miles from the Moravian station Okkak, and is as broad as the Thames at Gravesend. Up the river there is a bay surrounded on all sides by gently rising ground, well wooded with trees of moderate size. For about half a mile a fine slope extends, bounded on each extremity by a hill. The Moravians describe the land as

level and dry, watered by rivulets issuing from the woods, in which were found various European plants and flowers, different kinds of shrubs, such as junipers, currants, and the like, and grass and trees in abundance. The missionaries were informed that, further W., no wood grows along the coast. The soil at L'Anse à Loup is rich, and it is much the most eligible part of Labrador for settlers. Corn will not ripen, but serves for green food; and potatoes, cabbages, lettuce, spinach, and early Dutch turnips, do well. There is generally much rain on the whole coast, but now the temperature would appear to be more equable than it was some fifty years ago, if we may trust to the correctness of the reports of navigators. The current always sets to the southward along the coast. The tides rise six feet to the northward, and about four to the southward. The prevailing winds are from W.S.W. to N.W.

On the coast of Labrador the winter is extremely severe, the thermometer often falling thirty degrees below the freezing point; and although the houses of the Moravian missionaries are heated by large cast-iron stoves, the windows and walls are all the winter covered with ice, and the bed-clothes freeze to the walls. Rum is frozen in the air as rapidly as water, and rectified spirits soon become thick like oil. From December to June the sea is completely frozen over; and so intense is the cold during the winter months, that travelling is sometimes attended with the most painful consequences. The summer months, again, are extremely hot along the coast, the thermometer rising to eighty-six degrees of Fahrenheit, when swarms of musquitoes infest the air.

The mean monthly temperatures at the three northern missionary stations are as follows:—

STATIONS.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Hebron, N. Lat. 58. ⁰	5.24	53.1	4.52	16.83	33.01	36.61	43.57	49.10	38.84	29.43	23.58	5.18	22.52
Okkak ... 57.30	2.15	1.95	8.25	29.0	38.25	44.65	51.65	52.0	44.45	31.15	22.4	8.45	27.86
Nain ... 56.30	0.95	3.51	7.52	29.97	36.23	42.53	50.18	50.99	44.98	33.98	26.51	6.51	27.82

The climate, however, is not insalubrious; and, notwithstanding all its disadvantages, Labrador is of considerable importance to Great Britain. No country is better provided with large, convenient, and safe harbours, or supplied with better water; and vast multitudes of all those kinds of fish common to the arctic seas abound on the coast. Herrings are very fine and plentiful in August, but there is no weather to cure any kind of fish after the tenth of September. The rivers are frequented by salmon and sea trout; and pike, barbel, eels, river trout, and the like, are likewise found in them. On the numerous islands which are scattered along the E. coast multitudes of eider-ducks and other water-fowl breed. Those of large size have deer, foxes, and hares upon them. On the continent the wild animals are principally bears, wolves, foxes, and otters; beavers and deer are not numerous, but their furs are remarkably close and beautiful. The birds of the country are the white-tailed eagle, falcons, hawks, and owls of various kinds; raven, white grouse, ptarmigan, spruce-game, whistling curlew, gray plover, various kinds of sand-pipers and other waders; geese, ducks of various sorts, shags, gulls, divers, and some few species of small birds. During the short summer insects are very numerous, especially in swampy places. In winter they exist in a state of torpidity, from which they are aroused by the solar heat or artificial warmth. The phenomenon of the aurora borealis is uncommonly brilliant in this region, and exercises a very marked influence over the compass.

The exports of Labrador are cod, herring, pickled salmon, fresh salmon (preserved in tin cases), seal-skins, cod and seal oil, furs, and feathers. During the fishing season, from 280 to 300 schooners proceed from Newfound-

land to the different fishing stations on the coast, where about 20,000 persons are employed for the season. About one-third of these vessels make two voyages, loaded with dry fish, back to Newfoundland, during the summer; and several merchant vessels proceed from Labrador with their cargoes direct to Europe, leaving generally full cargoes for the fishing vessels to carry to Newfoundland. A considerable part of the fish of the second voyage is in a green or pickled state, and dried afterwards at Newfoundland. From 100 to 120 vessels come from Nova Scotia and New Brunswick. The principal part of their cargoes goes home in a green state. From 16,000 to 18,000 seals are taken at Labrador in the beginning of winter and spring. They are of a very large size, and the winter residents on the coast are said to feast and fatten on their flesh, which, when young, they account excellent eating.

No accurate account of the trade of Labrador can be obtained, as there are no custom-houses or public officers in the country; but the following estimate is probably as close an approximation as can be made to the annual value of the exports:—

In Newfoundland vessels.....	L.240,000
... Nova Scotia	96,000
... American	96,000
... Canadian	29,000
... Vessels owned or chartered by English or Jersey houses.....	96,000
	<hr/> L.557,000

Some, however, estimate the total exports at L.800,000. The salmon fisheries average annually about 30,000 tierces, not more than 200 of which find their way to Newfound-

La Bruyère land. The herring fishery is carried on by fishermen from Nova Scotia, Canada, Newfoundland, and the United States, and are shipped directly from the coast to a market. Of the seal-oil, seal-skins, furs, and feathers, only a very small portion finds its way to Newfoundland. Merchants and traders on the coast buy them in exchange for their goods, being less bulky and more valuable than fish. The imports of Labrador have been estimated by the authorities of Newfoundland at L.120,000.

One-third of the resident inhabitants are British servants, who take charge of the property left, and likewise employ themselves, in the spring and fall, catching seals. The other two-thirds live constantly at Labrador, and act in the capacity of furriers and seal-catchers on their own account, but chiefly as the former during the winter; in summer all are engaged in the fisheries. Half of these individuals are Jerseymen and Canadians, most of whom have families. There are six or seven English houses, and four or five Jersey houses, established at Labrador, unconnected with Newfoundland, who export their oil and fish directly to Europe.

The Labrador fishery has, since 1814, increased more than sixfold, principally in consequence of our fishermen being driven from the grounds now occupied by the French.

This vast country, equal in square miles to France, Spain, and Germany, has not a resident population exceeding 5000 inhabitants, including the natives and Moravians. The latter, an excellent and truly Christian people, have several settlements on this stern, inhospitable shore; and nothing but the purest spirit of religion and philanthropy could induce them to remain, and zealously labour to enlighten the miserable and disgusting native population. The principal station is at Nain, on the N. shore, where a ship annually arrives from London in July, laden with provisions and other necessities. At Nain there are four missionaries, at Okkak four missionaries, at Hebron three missionaries, and at Hopedale three missionaries. The total number of brethren was twenty-eight in 1852; and there were 1326 Esquimaux converts to Christianity. These Moravians came from Greenland about the middle of the last century, in the prosecution of their pious undertaking to enlighten the heathen. Their habits and mode of life are simple and quiet, corresponding to their isolated condition. Their trade is wholly with the Esquimaux, with whom they barter coarse cloths, powder, shot, guns, and edge-tools, for furs, oils, and other articles, the produce of the country. The Esquimaux, the most filthy and disgusting tribe yet discovered on the shores of America, are thinly scattered along the coast of Labrador. The greatest number of them in any one place appears to be at Inuvutoke Inlet, or Esquimaux Bay, on the Atlantic coast of Labrador, where there are about 250. (For a description of the Esquimaux, see the article GREENLAND.) The Canadians and others residing at Labrador employ these people in catching fish, and the like. Labrador belongs to the government of Newfoundland. During summer there is a court held, from which appeals are made to the supreme court of St John's. An armed vessel visits, and continues generally along the coast, during the greater part of the fishing season. (A. P.)

LA BRUYÈRE, see **BRUYÈRE**, *Jean de la*.

LABUAN, a small island in the Malay Archipelago, belonging to Britain, and lying off the N.W. of Borneo, about 30 miles N. of the town of that name, in N. Lat. 5. 22', E. Long. 115. 10. It is about 10 miles in length by 5 in breadth. (See BORNEO.) In 1854 the population (exclusive of military) was 1150; revenue, L.3535; expenditure, L.4307; vessels entered, 555; tonnage, 8682: cleared, 30; tonnage, 8114: value of principal imports, L.23,742; exports, L.15,382: coal sold, 6805 tons.

LABYRINTH, an intricate structure, with numerous

winding passages so involved and perplexing as to make exit or entrance without a clue almost impossible. Three great labyrinths are mentioned by ancient writers. The earliest and by far the most famous was that at Arsinoë, near the Lake Moeris, in Egypt. It is described by Herodotus and Pliny as having 3000 rooms, of which one-half were under ground. It was extant in the time of Pliny; but its ruins, if they still exist, have not yet been identified. According to Herodotus, it was used as a burial place for the kings and sacred crocodiles of Egypt. Another labyrinth, frequently alluded to in the classics, was that near Cnossus, in Crete. Tradition describes it as built by King Minos, on the model of the Egyptian one, but on a much smaller scale. The same legends make it the abode or prison of the Minotaur. None of the writers who mention this labyrinth describe it from personal inspection. No remains of it have ever been found, and it is probable that the tradition had merely in view one of the large natural caverns that abound in Crete. A third labyrinth is mentioned in the isle of Lemnos, similar in plan to that of the Lake Moeris. It is said to have been completed about the middle of the eighth century B.C. Remains of it were extant in the days of Pliny. Some have set it down as a temple of the Cabiri, but to what uses it was really put is unknown. Only one structure of this kind is known to have existed in Italy, the labyrinthine tomb of Porsena, near Clusium. See **CLUSIUM**.

LAC, a resinous substance formed on various trees in the East Indies by the punctures of an insect (*Coccus Lacca*), the exuding juice being formed into cells for its eggs. The resin encrusts the branches in grains; these branches, when gathered, are exported under the name of *stick-lac*; but when the grains are gathered, the colouring matter extracted, and the grains formed into flat cakes, the name of *seed-lac* is given, the granular appearance being still preserved; when the seed-lac has been melted up and formed into masses, it is called *lump-lac* or *button-lac*; when the seed-lac is further purified by melting over a charcoal fire, straining through bags of fine linen, and drying in thin layers on smooth surfaces of wood, it forms *shell-lac*, known as orange or ruby, according to the colour. The colouring matter of lac is used as a red dye on wool, but is inferior to cochineal. The chief use of lac in Europe is for making sealing-wax, and as a basis for *spirit varnishes*, and the so-called *French polish*. Shell-lac is commonly used for the purpose, but as the palest variety contains colouring matter, it cannot be employed for varnishing works of a light colour. It also contains a little wax, and other matters not soluble in spirits of wine, or pyroligneous spirit, which is commonly used for the purpose, the effect of which is to make the varnish cloudy; this is unimportant in varnishing dark coloured works, and may be avoided by making the solution without heat, and decanting the clear portions from the insoluble.

The best stick-lac comes from Siam, that of Assam ranks next, while that of Bengal is inferior. The colouring matter is obtained by pouring warm water on the stick-lac. The colour is made into square cakes, and sold under the name of *lac-dye*, *lac-lake*, or *cake-lake*. There are various methods of bleaching lac, by means of chlorine, animal charcoal, &c. Lac gives the name to, and enters into the composition of, various *lackers*. See **DYEING**, iv., §§ 1, 4; **LACKER**; and **VARNISHES**. (C. T.)

LA CAILLE. See **CAILLE**, *Louis Nicholas de la*.

LACCADIVES, an archipelago of low islands lying off the western coast of India, between 8° and 13° N. Lat. There are nineteen considerable ones; but as most of them are surrounded with reefs and steep rocks, with a great depth of water close to them, the approach to them is very dangerous. Between these islands there are many channels, through which ships from India, bound to Persia or Arabia,

Lac
Laccadives

Lace.

frequently sail. The safest of these is called Mamale, or the Nine-degree Channel, which runs between the islands of Seuhilipar and Kalpenny. The largest of these islands is about 7 miles in length and $2\frac{1}{2}$ in breadth. Most of them are inhabited by a race of Mohammedans called Moplays. They do not yield grain, but produce an infinite quantity of cocoa-nuts, from the husks of which they form the *coir* cables, which are more elastic and durable than hemp, as the sea-water, instead of rotting, preserves them. These islands are well supplied with fish, and carry on a trade with the small shells called *courries*, which pass as coin all over India and most of Africa. Most of these islands are under the uncontrolled management of the beebie of Cannanore, subject to the payment of an annual tribute to the British government. A proposal has been made to the beebie to transfer them to the British, in consideration of a pecuniary equivalent. They were discovered by Vasco de Gama in 1499, but have since been little frequented by Europeans.

LACE, from *lacinia*, the guard hem or fringe of a garment, is a plain or ornamented network, consisting of threads of gold, silver, silk, flax, or cotton, tastefully interwoven so as to form a beautiful texture. This delicate fabric appears to have claims to high antiquity, but its origin is involved in considerable obscurity. That it was worn by Grecian females is certain, and the derivation of the word *lace* affords presumptive evidence that it was also in use amongst the Romans. In Venice, and the neighbouring states of Italy, it was very early worn; and Mary of Medicis is supposed to have been the first who introduced its use into France; but as early as 1483 it was included in a list of articles prohibited from importation into England. Hence it had been made in this country *prior* to the period above mentioned; and this prohibition, like many other subsequent acts, was for the protection and encouragement of home manufactures. But *pins*, which are indispensable in the process of fine lace-making, were unknown till long afterwards; so that it is probable the fabric made was neither very fine in texture nor produced to any great extent. It is uncertain by whom the manufacture of lace was originally introduced into this country. About the middle of the seventeenth century the lace trade was flourishing in Buckinghamshire; and so greatly had it advanced in England, that, by a royal ordonnance in France, passed in 1660, a mark was established upon the thread lace imported from this country and from Flanders, and upon point lace from Genoa, Venice, and other countries.

Pillow, or Thread Lace, is made by placing a perforated pattern on a hard stuffed pillow, and the thread required is wound upon bobbins with a groove in the upper part for retaining the thread; while, to form the meshes, pins are stuck in the cushions, and threads woven or twisted round them, the pattern showing the points of insertion for the pins, and also the direction for the gimp, which is interwoven with the fine threads of the fabric to form the pattern. At the commencement of the work the bobbins are arranged on one side of the cushion, and are brought to the front side, two pairs at a time, and twisted together. The woman holds one pair of bobbins in each hand, and twists them three times over each other to form the sides of the mesh, the adjacent bobbins of each pair are next interchanged, so as to cross these threads over one another to form the bottom of the next. Supposing the four bobbins to be marked 1, 2, 3, 4,—No. 1 is twisted round 2, and No. 3 round 4; these, in order to cross 2 and 3, are interchanged, so that 1 and 3 and 2 and 4 come together, and at the next twist these pairs of threads will be combined. As the meshes or half-meshes are formed, they are secured by pins. These four bobbins are now put on one side of the cushion; two more pairs are brought forward, twisted and crossed as before, and these operations are repeated until a row of meshes is formed of the required breadth,

when the bobbins are worked over again to form another row. From 48 to 60 bobbins are required for every inch of breadth. Pillow or thread lace, formerly employed a large number of women and children in the counties of Bedford, Buckingham, Northampton, and Oxford, but the demand for this kind of white thread lace failed, and black lace took its place. *Honiton lace* differs from pillow lace in having the pattern made separately. The ornaments were formerly confined to simple sprigs and borders; but the fabrics now produced show extreme delicacy of execution, with beauty and taste in design: flouncings, shawls, scarfs, handkerchiefs, berthes, &c., now vary in price from 10 to 200 guineas. The Honiton lace district extends about 30 miles along the coast of Devonshire, and about 12 miles inland. In 1851 from 7000 to 8000 persons were employed in the manufacture.

British point, tambour, and Limerick laces are chiefly imitation, and are produced in shawls, scarfs, dresses, court trains, flouncings, lappets, &c. British point is made chiefly in the neighbourhood of London, tambour chiefly at Islington, Coggleshall, and Nottingham, while Limerick lace is peculiar to Ireland. Black laces now occupy a considerable portion of the attention of the trade.

The most celebrated laces have been classed as,—1. *Brussels*, the most valuable. There are two kinds: *Brussels ground*, having a hexagon mesh, formed by platting and twisting four threads of flax to a perpendicular line of mesh; *Brussels wire ground*, made of silk; meshes partly straight and partly arched. The pattern is worked separately, and set on by the needle. 2. *Mechlin*: a hexagonal mesh, formed of three flax threads twisted and platted to a perpendicular line or pillar. The pattern is worked in the net. 3. *Valenciennes*: an irregular hexagon, formed of two threads, partly twisted and platted at the top of the mesh. The pattern is worked in the net similar to Mechlin lace. 4. *Lisle*: a diamond mesh, formed of two threads platted to a pillar. 5. *Alençon*, called *blond*: hexagon, of two threads, twisted similar to Buckingham lace; considered the most inferior of any made on the cushion. 6. *Alençon point*: formed of two threads to a pillar, with octagonal and square meshes alternately.

In the manufacture of lace France takes the lead; and it is calculated that the production of lace by hand gives employment in that country to upwards of 200,000 females of all ages. It is all made with bobbins upon a small pillow, except at Alençon, where the needle only is employed. The materials used are hand-spun linen thread, cotton, wool, silk, and gold and silver thread. *Point d'Alençon* is the only lace made with pure linen hand-spun thread; this thread is worth from L.100 to L.120 per pound. White lace is now chiefly made with cotton thread, Nos. 120 to 320. The principal seats of the manufacture are,—Caen and Bayeux, Chantilly and its neighbourhood, Lille, Arras, Mirecourt, Puy, Bailleul, and Alençon. Each of these districts has its own peculiar style; and although the lace may be made in the same way, and with the same material, in all these districts except the last, yet each is easily recognised. Silk blond originated at Caen, and was so called from being made of undyed silk of a nankeen colour: the finest white or the finest black silk is now employed. Caen and Bayeux excel all other places in the production of piece goods, and manufacture shawls, robes, mantles, &c., more extensively than any other districts in the world. By means of a stitch called *rucroe*, the women of the department of Calvados join several parts into one piece so cleverly as to defy detection, even with a magnifying glass. Most of the improvements and novelties in lace-making originate at Mirecourt; it produces the same kind of lace as Lille and Arras, viz., clear foundation, *fonds clair*, and also *fonds de champs*, in white thread, also a lace resembling the Honiton called *guipure*.

Lace.

Lace.

Flowers are also made, and sewed upon the extremely fine net called Brussels net, closely resembling the Belgian fabric. The whitest and cheapest French lace is produced at Bayeux.

Belgium is the great rival of France in the manufacture of laces, the chief varieties of which are known as *Brussels*, *Mechlin*, *Valenciennes*, and *Grammont*. Brussels produces two descriptions of lace, known as *point à l'aiguille*, and *Brussels plait*, the one made entirely with the needle and the other on the pillow. The finest kind is made of very fine flax thread, and some of cotton: it is remarkably soft and clear, but very costly. Mechlin laces are made at Malines, Antwerp, &c. They are made in one piece on the pillow, and the flowers are surrounded by a plait thread, which designs the outline, and has the effect of embroidery. Valenciennes laces are made chiefly at Ypres, Menin, Courtrai, Bruges, Ghent, Alost, and their respective neighbourhoods, each town having its characteristic peculiarities by which its productions are identified. Ypres produces laces of the finest square grounds, varying in price from 6d. to L.50 the English yard.¹

It is natural to suppose that attempts would be made to lessen the cost of production of so beautiful and costly an article as lace. It was not, however, until machinery had been largely introduced for the purpose of manufacturing textile fabrics that lace machinery can be said to have been successfully employed. About the year 1768 a framework-knitter of Nottingham employed the common stocking-frame in the manufacture of lace, and about the same time another person of the same place introduced a pin machine for making single-press point-net in imitation of the Brussels ground. Various machines were from time to time introduced, all of which, except the *warp machine*, have been superseded by the *bobbin-net machine*, so called from the circumstance that the thread that makes the lace is partly supplied from bobbins and partly from a warp. The first successful machine of this kind was made and patented by John Heathcote in 1809, the principle of which was to pass the bobbins from front to back, and from back to front, while a lateral motion was imparted to the warp-threads, thus causing one series of threads to wrap round the other. The first machine was so complicated, that sixty motions were required to complete one hole, an effect that can now be produced with six. The cost of production has also more than proportionally decreased; for in 1815 one square yard of the produce was worth 30s., and can now be purchased for 3d. Up to the year 1831 plain net and quillings were the chief produce of the bobbin-net machine; but about this time methods were introduced to *purl* and *bullet-hole* the edges of narrow laces, finishing them afterwards, with a gimp thread, with the needle. The machines used were known as the *Leavers*, named after the original constructor; the *pusher machine*, so called from having independent pushers to propel the bobbins and carriages from front to back, instead of pulling or hooking them; the *circular machine*, so called from the bolts or combs on which the carriages pass being made circular instead of straight; the *traverse-warp machine*, so called from the warp traversing instead of the carriages. About the year 1839 the *Jacquard* apparatus was successfully applied to a pusher machine; and since 1841, when a plan was discovered for applying the Jacquard to the guide-bars, scarcely a machine has been worked without the ornaments being applied by means of cards. New sources of manufacture soon developed themselves, such as flouncings, scarfs, shawls, window-curtains, &c. Lace goods are now manufactured for all parts of the world, and lace-designers—greatly assisted by the Government School of Design at Nottingham—have proved themselves adequate to the de-

mands of a diverse and greatly extending trade. At the time of the Great Exhibition the articles manufactured by the bobbin-net machines consisted of—1st, Black silk piece-net ornamented, shawls, scarfs, flouncings, trimming-laces, blonds in white and colours, some finished on the machines, others ornamented partly by machinery, and afterwards embroidered by hand. Such goods are exported annually to the value of upwards of L.150,000, and they are lower in cost by from 75 to 90 per cent. than the class of hand-made articles which they represent. 2d, Cotton edgings, laces, insertions, linen laces, in imitation of white pillow lace, muslin edging and laces, fancy-piece net, spotted net, plain net, in imitation of the costly Valenciennes lace. 3d, Curtains in imitation of the Swiss bed-covers and blinds. 4th, Silk and cotton goods, plain net Mechlin grounds, blond, Brussels or extra twist.

In the year 1851 there were 3200 bobbin-net machines in operation at Nottingham, representing, with the subsidiary trades, a total capital of L.2,965,945; the total number of hands employed, 133,015; and the annual amount of business returns was estimated at L.2,300,000.

Before proceeding to notice the construction of the bobbin-net machine, it may be useful to remark, that a piece of lace (figs. 1 and 2) consists of a series of nearly parallel

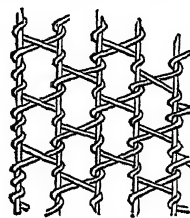


Fig. 1.

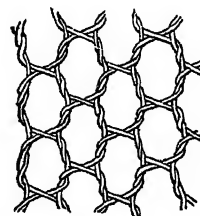


Fig. 2.

warp-threads, lying in one direction, with a weft-thread twisting once round each warp-thread until it reaches the outer one, and then making two turns, and proceeding to the other border in a reverse direction. The double twist and the return of the weft-threads forms the selvage. This twisting and interlacing of the warp and weft produce regular six-sided meshes. It will be seen from the figures that the fabric is formed by the union of three sets of threads, the one forming the warp proceeding in a waving line (fig. 2) from the top to the bottom; the second set proceeds to the right, the third to the left, the two latter being weft-threads, which cross obliquely in the centre between every two meshes, one set of weft-threads drawing the warp to the right, and the other to the left. When the warp-threads have been laced twelve times by the weft, the latter is moved sideways through one interval of the warp. In ordinary weaving the threads of the warp are alternately raised or depressed for the passage of the weft; but in lace-making the warp-threads are shifted sideways to the next pair, to which they are united by the weft-threads, which also work in pairs, each entwining two individual threads at once.

The thread for the warp is wound upon a roller, and for the weft upon small bobbins. Fig. 3 represents one of the bobbins B, mounted in its carriage c, and shown detached in section at B'. It consists of a couple of thin brass disks, with a square hole in the centre, and rivetted together with a smaller disk between, so as to leave a circular groove for the reception of the thread. From one to two hundred bobbins are spitted upon a square spindle, and mounted in a frame; the thread is conducted from a drum through the slits of a brass plate, and a thread being attached to each bobbin, the spindle is turned round, when the drum revolves and delivers its thread. About 100 yards of thread

¹ Further details of the statistics of lace will be found in the "Jury Report of the Great Exhibition of 1851, class xix., and some remarks on lace design in the "Supplementary Report on Design."

Lace.

are wound on each bobbin, which quantity is indicated by a hand moving round a dial-plate in connection with the re-

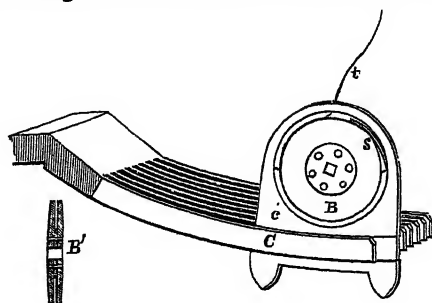


Fig. 3.

volving apparatus. As many as 1200 bobbins may be required for one machine. Each bobbin is inserted in a small iron frame or bobbin-carriage, in which it is held by a spring *s* (fig. 3), and the thread *t* passes out through an eye at the top; on gently pulling this thread the bobbin turns round.

The working parts of the machine are shown in a vertical section or end view (fig. 4), in which *A* is the thread-beam containing the warp, and *B* a similar roller for receiving the finished work. Between these two rollers the warp-threads are extended vertically, and they are strained over guide-bars, *a, a*, from which the threads pass through the eyes of needles, *n*; each guide-bar has a shagging or slightly shifting motion to the right and to the left, to allow the bobbins to pass to the right or to the left of the warp-threads as often as is necessary to produce the twist. The bobbins are arranged in a double line in two rows, *c c* (fig. 4), on each side of the warp-threads, and the bobbin-carriages are supported between the teeth of a comb, *CC* (fig. 4), shown separately in fig. 3, each bobbin-carriage having a groove for the reception of the teeth of the comb. It will be seen from fig. 4 that there is a comb on each side of the work, and the free ends of the teeth in the opposite combs are so near to each other that there is only sufficient space for the proper motions of the warp-threads between them, so that the carriages, in passing across through the intervals of the warp, reach the back bolts before they have entirely quitted the front ones. The bobbin-carriages are alternately driven from one comb to the other by two bars, *b, b*, and when one of the lines of carriages is pushed nearly across the intervals of the warp, the foremost of the catches projecting below the comb comes in contact with a plate *d*, attached to a revolving shaft, and this pushes it quite through. The beam to which the combs are attached has a short sidelong motion, by which the relative position of the opposite combs is changed by one interval or tooth, so as to transfer the carriages to the next adjoining teeth, by which means all the carriages make a succession of side steps to the right in one

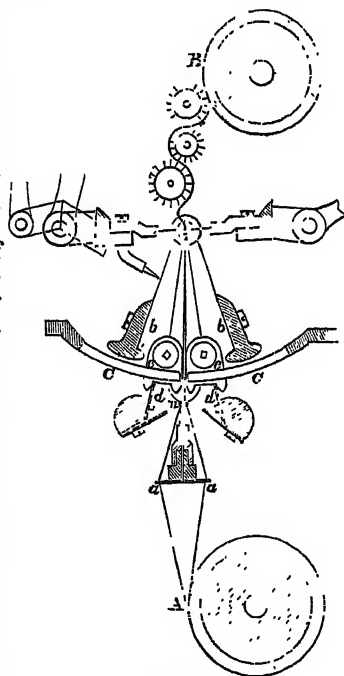


Fig. 4.

comb, and to the left in the other, whereby the bobbins cross each other, and again twist round the vertical warp-threads, so as to form the meshes of a net. When the bobbins have moved several times round the warp-threads, a point-bar shown on the left, a little above *b* (fig. 4), containing a row of pointed needles, falls between the warp and weft threads, and carries up the interlacings of the latter to form a new line of holes or meshes in the lace. Here it remains while the other point-bar makes a similar movement to form a second line of meshes, so that the working of the machine consists of a repetition of twisting, crossing, taking up the meshes, and winding the finished lace on the roller *B*.

Bobbin-net lace owes much of its beauty to the quality of the threads, and the correct shape of the meshes. By increasing the number of warp-threads within a given space the meshes are reduced in size, and finer lace is formed. There may be from 700 to 1200 and upwards of warp-threads in a piece one yard wide. The fineness, or *gauge* or *points*, as it is called, depends on the number of slits in the combs, and hence on the number of bobbins in an inch; thus, *gauge nine points* indicates nine openings in 1 inch of the comb. The length of work counted vertically, and containing 240 holes or meshes, is called a *rack*. A circular-bolt machine may produce about 360 racks per week. Bobbin-net is made up in pieces of from 20 to 30, or more, yards in length, and of variable breadth. Narrow quillings are worked together in a number of breadths, united by threads, which are afterwards drawn out. In well made lace the meshes are slightly elongated in the direction of the selvage. Ornaments, consisting of separate flowers, sprigs, &c., are worked in by a Jacquard apparatus attached to the frame; but as the ornaments are all necessarily connected by the thread of gimp which forms them, the connected thread is afterwards cut out with scissors, by children employed for the purpose. Where the machine produces only plain net, the pattern is worked in by hand, the lace-runner being guided by a lithographic pattern placed under the net. When the embroidery is complete, it is examined, defective parts are marked by tying the lace in a knot, and these are restored by a distinct set of women called *lace-menders*. The net is gassed before being embroidered; bleaching or dyeing is performed afterwards; dressing, rolling, pressing, ticketing, and making up, resemble the processes described under CABLE-LENDERING.

In addition to the bobbin-net machine for making lace, there is also the *warp-machine*, invented about the year 1775. It was suggested by the stocking-frame, in which only one thread is required, whilst in the warp-frame there is a thread to each needle. The first articles made by it were silk stockings, with blue and white zig-zag stripes, or *vandykes*, as they were called, from the name of one of the four claimants to the invention of the warp-frame, the other three being Englishmen. About 1784, a Nottingham mechanic greatly improved the warp-frame by the application of the rotatory motion, and the cam wheels to move the guide-bars, still known as *Dawson's wheels*. The improved frames produced officers' sashes, purses, braces, and other elastic textile fabrics, the manufacture of some of which still continues. In 1796 a new fabric was produced from the warp, and employed for sailors' jackets, pantaloons, and the article known as Berlin, so much used for making gloves. Warp-machines were the first to produce ornamental patterns on lace, such as spots, bullet-holes, &c., which had been previously embroidered or tamboured by hand. The bobbin-net machine, invented in 1809, soon became a formidable rival of the warp, and influenced its fortunes in various ways, until 1839, when the Jacquard apparatus was applied to it, and so much increased its capabilities as to introduce into the warp-lace trade of Nottingham a new class of products of elaborate design, such as shawls, scarfs, mits, falls, laces, &c. Of late years, the

Lace.

Lace. *twist-machine* has been employed on similar goods, and has to a great extent superseded the warp. Great improvements have also been introduced in the English methods of *dressing* lace, especially in silk goods. Many new kinds of elastic fabrics, in gloves, in silk, and other materials, have been introduced. Velvet, and velvet in combination with lace, have also been produced at the warp-frame. At the time of the Great Exhibition there were about 1400 warp-frames in operation, namely about 600 in Leicestershire, about 400 in Derbyshire, and about the same number in Nottinghamshire. The employment in the various branches was estimated as follows:—150 machines engaged in the production of blond, and other silk laces; 150 in cotton tatting, 550 in Leicester hosiery, &c., 100 in lace gloves and mits, 150 in woollen cloth, hosiery, purses, and various fabrics for gloves, &c. The first machines were about 16 inches in width; they are now, in the Nottingham trade, from 90 to 150 inches in width, and in the Leicester hosiery trade, from 44 to 72 inches. The number of persons employed in the warp trade in 1851 was estimated at 10,000, and the capital invested at L.360,000, making a return per annum of L.700,000. In the Great Exhibition was exhibited a power machine, capable of producing (working 12 hours per day) 800 racks per week, which, when dressed, would be equal to about 1200 square yards. A yard of 4-quarter white silk blond, which in 1830 cost 2s., can now be had for 6d.

*Gold and silver lace.*¹ The textile fabric known as gold or silver lace consists of warp threads of silk, or of a mixture of silk and cotton, while the weft or shoot is a silk thread covered with silver, or with silver gilt, as the case may be. The production of this thread is a remarkable illustration of the extensibility of gold, and of the ductility of silver. The silver preferred by the wire-drawers is that which has been separated from argentiferous galena, this being less brittle than the silver obtained from purer sources. From 400 to 500 ounces are cast into an ingot about 2 inches in diameter, and from 20 to 24 inches in length. This is made red-hot in a charcoal fire, and hammered until sufficiently reduced to pass through the first hole of the draw-plate, the hammering increasing the tenacity and elasticity of the metal. After the bar has been reduced by passing through 10 or 12 holes, it is planed, in order to remove any imperfections from the surface which would interfere with the perfect gilding; the blemishes are readily detected by the reflection of a sheet of foolscap paper slightly arched, and placed over the bar. The bar is now gilt, by placing on it a number of gold leaves, varying from 10 to 30, according to the richness of the wire required, the higher qualities being used for military purposes, and pearls and bullions for embroidering, while the lower qualities are used for liveries, the ends of muslins, and for skein threads exported to India and China. The gold leaves are placed in a row, side by side, nearly the length of the bar, on a piece of cartridge paper: the bar is then gently placed on the leaves, pressed close, and the edges of the leaves raised up until the silver is entirely covered. The bar is next enveloped in paper tied tightly round with cord, and placed in a charcoal fire, where it is left until it becomes of a bright red heat, the paper not burning but becoming red with the metal, when it slowly consumes, after which the bar is withdrawn. While still red-hot it is burnished with a blood-stone or with South Sea axe-stone, for the purpose of uniting the gold and the silver perfectly. When cold the surface is covered with wax, and the bar is drawn into wire through graduated steel dies, and, after one or two annealings, finished by drawing through perforated rubies, so fine, that from an ounce of metal a wire a mile and a quarter in

length is produced. At this point the wire has not so rich and deep a shade of yellow as is required, but this is given by winding the wire round a copper cylinder, with the addition of a small portion of wax, and filling the cavity of the cylinder with red-hot charcoal made from birchwood, the effect of which is to deepen the colour and render it permanent. The next process is to flatten the wire by passing it between a couple of steel rollers, one of ten, and the other of four inches in diameter, made of the finest steel, and of exquisite polish. They are manufactured in Rhenish Prussia, at a cost of L.120 for a single pair of rollers. The flattened wire is wound on small bobbins, which are placed in the centre of circular rings, attached to a bar, over a spinning frame. On the front of the frame are bobbins of silk, the threads of which pass through the centre of the ring to which the reel of wire is fixed. The whole is set in motion, and while the thread is being twisted, the ring with the wire revolves round the thread in the opposite direction. In this way from 30 to 40 threads are covered at once, the result being a resplendent flexible gold thread, adapted to the purposes of lace-making, embroidery, &c. Of this thread, although gold only appears, probably nine-tenths of its bulk is silk, while of the remaining $\frac{1}{10}$ th only $\frac{1}{10}$ th part is gold.

It is highly probable that the process of electro-gilding will greatly simplify some of the above processes, but the plans hitherto adopted for the purpose have not been successful. Mr A. Hock has contrived a mechanical process for the gilding of fibres. The silk used for the purpose must be of good quality, free from knotty nibs and rough places. The gum must be boiled out, and the silk be dyed of a light orange tint. It is then wound on bobbins, from which it is passed through a trough containing a glutinous transparent liquid. It is now passed over a reel attached to an endless screw or threaded spindle, arranged so as to lay the silk in close coils on a brass cylinder. Gold leaf is then applied to the silk until the entire surface of the roller is covered. The roller is then turned round, and a burnisher of wood covered with cloth or wash-leather is applied: this presses the leaf close to the silk, and separates it between the windings, thus gilding the thread, which may be of as fine a quality as desired. If the entire thread is to be gilded, it is wound on another cylinder, so as to expose the ungilt part of the thread, and the process is repeated. It is next wound on reels, dried, and then transferred to boards or *planchettes*, and is ready for the market. The thread is of the natural colour of the gold leaf; it is light, and perfectly flexible. Fabrics made of this gilded silk are much lighter than those produced with the ordinary gold thread. (C. T.)

LACÉDÆMON. See SPARTA.

LACÉPÈDE, BERNARD-GERMAIN-ÉTIENNE DE LA VILLE-SUR-ILLON, COMTE DE, an eminent French naturalist, was born December 26, 1756, at Agen, the chief town of the department of Lot-et-Garonne, in the S. of France. His father, the Comte de la Ville, lieutenant-general of the Sénéchaussée at Agen, gave him the name of Lacépède, in honour of a rich relative who had made him his heir. The family is admitted by Cuvier, in his *Eloge Historique* on Lacépède, to have been one of the most ancient and honourable in the province. At an early age the future naturalist lost his mother, but his education was conducted with the most anxious care by his father. Pains were taken that all his early impressions should be of good; and for a long time he did not know what a bad book or a bad man was. "At the age of thirteen," he writes in his *Memoirs*, "I still believed that all poets were like Racine or Corneille, all historians like Bossuet, all moralists like Fénelon." In his solitude at the Castle of Lacépède he read largely the best

¹ Fuller details on this subject will be found in the *Journal of the Society of Arts*, No. 178, in the Report of Mr F. Bennoch's paper on "Thread or Fibre Gilding."

Lacépède.

French authors, and learned to observe and reflect. One of the first books put into his hands was Buffon's *Natural History*, which he read and re-read till he knew it nearly by heart. Buffon became his model, and his time was henceforth cheerfully given to the study of natural history and philosophy in all their branches. Music was the only amusement he allowed himself. He was passionately fond of it, and besides playing admirably the piano and the organ, he composed with no mean skill and success. The only two operas he ever wrote were highly praised by Gluck, though neither of them was ever brought on the stage. Lacépède's first experiments were on electricity, and one of these had very nearly proved fatal to him. The results, when communicated to Buffon, drew forth so encouraging an answer from the old man that his correspondent immediately set off to Paris to see him. In the capital he fell in with a German prince, who offered him a colonelcy in the imperial army. He closed with the offer, but never joined, or even saw, his regiment, though he wore its uniform, and called himself its colonel. He made his début in authorship in 1781 by his *Essai sur l'Électricité*, which he followed up, two years later, by his *Physique Générale et Particulière*. Both of these works were written on the same principles as Buffon's *Natural History*, though their subjects manifestly called for a very different mode of treatment. Their author became convinced of his mistake when it was too late, but obviated its bad consequences by buying up and destroying every copy of both works on which he could lay his hands. Charmed with the devoted attachment of his young friend, Buffon appointed him in 1785 sub-demonstrator in the Jardin du Roi; and as his own strength was now beginning to decay, proposed that he should continue the *Histoire Naturelle*. Lacépède accepted the proposal, and continued his researches with renewed zeal under the eye of his friend and teacher. In 1788 he published, as a continuation of Buffon, his *Histoire Naturelle, Générale et Particulière, des Quadrupèdes Ovipares*; and in the following year another volume *On Serpents*. "This work," says Cuvier, "by the interest of the facts embodied in it, and in a strictly scientific point of view, presents incontestable advantages over the immortal work of which it is the continuation." No races are visible of that antipathy to method and a precise nomenclature which marks Buffon's part of the work. Lacépède established classes, orders, genera, characterized clearly subdivisions, and enumerated and named with care the species that strictly belong to each. But with all the method of Linnæus, he is as little philosophical as he, forming his groups entirely upon external characters, and disregarding internal structure and anatomical relations altogether. When the French Revolution broke out, Lacépède, though by birth an aristocrat, was at first favourable to it. He was twice president of the Parisian Electoral Assembly, and in 1791 became a deputy of the Legislative Assembly. He never attained any eminence, however, either as a speaker or as a politician. When the course of events seemed to bring his life into danger, he lost the little courage he had, and fled from Paris altogether, only returning thither when the death of Robespierre had put an end to the Reign of Terror. When the Jardin du Roi was re-organized as the Jardin des Plantes, he was appointed to the chair set apart for the history of fishes and reptiles. In 1796 he was chosen into the Institute of France, and two years later gave to the world his *Histoire Naturelle des Poissons*, of which the fifth volume appeared in 1803. This treatise was undoubtedly the greatest in that branch of science till it was driven out of the field by the much more comprehensive and philosophic work of Cuvier and Valenciennes. Lacépède's work was founded on the lists of fishes drawn up by Gosselin and Bonaterre, and included the specimens added to the royal collection before the war, as well as those in

the cabinet of the Stadtholder, brought to Paris after the conquest of Holland. Further than this it can scarcely be said to have enlarged the limits of the science at all. His work is consequently very incomplete, but it should be remembered that the comparative anatomy of fishes was in his day very little studied, and, from the political state of the country, the difficulty of procuring new specimens greater than it had ever been before or has been since. In society Lacépède was easy, polite, and anxious to agree with every body. He carried the same spirit into his scientific researches, listened believingly to the lies of travellers, and took for gospel everything that had been written by previous inquirers. Hence the complete absence of searching criticism, and the gross mistakes which, with a little care, he might easily have avoided. In 1814 appeared his *Histoire Naturelle, Générale et Particulière, des Cétacés*, the last and best of his separate works, though open to the same objections as have been already raised against his *Natural History of Fishes*. From this time, till his death, his public duties took up so much of his time that, except an occasional article in the *Annales du Muséum*, he made no further contribution to science. In 1799 he became a senator; in 1801 he was made president of the senate, and two years later grand chancellor of the Legion of Honour. In 1804 he was created a minister of state, and at the Restoration a peer of France. During the Hundred Days he again took office under Napoleon, as grand master of the university. He died at Épinay, October 6, 1825, in the seventieth year of his age.

With many of the qualities of a good naturalist, Lacépède wanted many that were indispensable. Many of his scientific errors are directly traceable to defects in his personal character. He was pre-eminently wanting in independence of character. Like the vicar of Bray, he cared little who sat on the throne of his country, if he retained his offices. "It is now six-and-twenty years," he wrote, "since the Revolution broke out, and during all that stormy period, thanks to Providence, I have never once failed of the obedience due to the laws and the established government." Every government in succession accepted and trusted him, because he accepted it. Indeed, he never contented himself with recognising each in its turn, but went out of his way to welcome it with the most servile adulations. In allusion to his fawning habits, and to the nature of his studies, he was nicknamed by his contemporaries "the Prince of Reptiles." But though he cringed abundantly to the men in power, he was kind and gentle to those of station lower than his own. He did a great deal of good in a very unostentatious manner, and spent the whole of his private fortune in charities. More than once he was only saved from serious embarrassments by the generosity of Napoleon. So popular had his liberality made him, that his death was mourned as a public calamity.

LACHESIS. See PARCÆ.

LACHMANN, KARL, a distinguished critic and philologist, was born at Brunswick, 4th March 1793. His love of literature displayed itself during his early education at his native town, and only became more deeply rooted as he advanced to the scientific study of languages at the universities of Leipzig and Göttingen. It was at Göttingen, under G. F. Benecke, with whom he was afterwards associated in literary labour, that his attention was first directed to the early literature of Germany and northern Europe. During 1815 he served in the Prussian volunteer corps against Napoleon, and in the following year was appointed teacher in the Frederic Gymnasium of Königsberg, whence he was speedily promoted to a professorship in the university. In 1827, he was elevated to a chair in the university of Berlin, and he continued to discharge the duties of his office till his death in 1851. On the Continent he is perhaps best known as a careful editor of

Lachesis
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Lachmann.

Lachryma-
tory
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Lacker.

the classics, and a masterly critic both of classical and Teutonic antiquity; but in England his fame rests almost exclusively on his editions of the New Testament and Vulgate. These last were published, the smaller edition drawn from what he styles oriental sources alone, in 1842; the larger, embracing both eastern and western authorities, in 1850. His critical scheme is expounded by himself in the *Studien und Kritiken* for 1830. The text is peculiar, being compiled on a clear and definite, although too mechanical plan, and may be defined as the most historically attested reproduction, without by any means being the best representation, of the original. With mathematical precision he follows the authorities of the first four centuries, to which he attaches a value somewhat arbitrary; and it is inconsistent with his plan to avail himself of internal evidence, even in removing what is a blunder by confession. His labours have thus only a partial utility; and Tischendorf has successfully pointed out various passages in which Lachmann has deviated from the mechanism of his plan. The East fails to furnish fragments of sufficient antiquity with which to construct one-half of the New Testament, and gaps so large and important must be filled up from occidental sources, that the attempt, by mere scissor-work upon old MSS. to reconstruct an oriental New Testament of the first four centuries, must be dismissed as impracticable. Lachmann himself, in the preface, takes care to warn his readers, that where the margins are free from the *débris* of various readings there is the feeblest evidence that the clear tracings of the text are original sculpture.

In the criticism of ancient literature, Lachmann's greatest works are his Essays *On the Nibelungen Lied*, and *On Homer*. Many valuable essays on other subjects are hid in the periodicals of the day. His editions of the classics embrace Catullus, Tibullus, Propertius, Terence, Babrius, Avianus, and Caius. His other works are, *The Sagabibliothek of Scandinavian Antiquity* (trans.), 1816; *Essay On the Original form of the Poem of the Nibelungen Calamities*, 1816; *Selection from the Poets of the 13th Century*, 1820; *The Nibelungen Lied* (edited), 1826 and 1840; Hartmann's *Iwain* (ed.), 1827; *The Poems of Walter von der Vogelweide* (ed.), 1827; *Songs of Wolfram von Eschenbach* (ed.), 1833; Hartmann's *Gregor von Stein* (ed.), 1838; Shakspeare's *Sonnets* (trans.), 1820; *Macbeth* (trans.), 1829; Lessing's *Collected Works* (ed.), 1838 to 1840, &c., &c.

LACHRYMATORY, the name applied to small bottles often found in the tombs of the ancients, and so called because supposed to contain the tears of the deceased's friends. These phials are made of glass or earthenware, with a long neck, and the mouth formed, as was thought, to receive the eye-ball. The figure of one or two eyes has sometimes been found impressed upon them. It is more probable, however, that they contain aromatic balsam or such liquids as were used for preserving the dead, as no mention is made of preserving the tears of mourners or friends. On a marble bas-relief in the Capitol, representing the obsequies of Meleager, a female appears approaching the funeral pile, and in her hand is a phial closely resembling the so-called lachrymatories.

LACKER, or LACQUER, is a varnish used on certain works in wood or metal. A hard-wood lacker may be made with 2 lb. shell-lac, to 1 gall. spirit of wine. A pale lacker for brass may be made with $\frac{1}{2}$ lb. of the best pale shell-lac to 1 gall. of spirit, with agitation for six hours without heat. After standing for some time, the clear liquor is to be decanted off. The lacker may be tinted yellow with turmeric, Cape aloes, saffron, or gamboge; for a red tint, arnotto and dragon's-blood are employed. A pale gold-coloured lacker may be made with 8 oz. of shell-lac, 2 oz. of sandarac, 8 oz. of turmeric, 2 oz. of arnotto, and $\frac{1}{2}$ oz. of dragon's-blood to 1 gall. of spirit of wine. Mr A. Ross

uses pyro-acetic ether to dissolve the shell-lac and the gamboge, by which means only the purely resinous portions are taken up, the gummy matters, which are soluble in the water of the spirit of wine, being rejected. The clear liquor is decanted, and is diluted for use with spirit of wine. The green lacker used for bronze works is produced by the addition of turmeric and gamboge.

In lackering brass and other metals it is necessary that they should be chemically clean; and it is usual to raise the articles to nearly the temperature of boiling water, in order that the lacker may flow more readily, and the spirit evaporate quickly, in which case the lacker attaches itself more firmly to the metal, and a more brilliant effect is produced. A *hot-plate*, or *lacquering furnace*, is described under FURNACE. For further details, see VARNISHES; also, 3d vol. of Holtzapffel's *Mechanical Manipulation*. (C. T.)

LA CONDAMINE. See CONDAMINE, *Charles Marie de la*.

LACONIA, or, as it was often called, LACONICA or LACEDÆMON, a country of ancient Greece, was bounded on the N. by Arcadia and Argolis, W. by Messenia and the Messenian Gulf, and S. and E. by the Mediterranean. Its extreme length from the Arcadian frontier to Cape Tænarum is nearly 80 miles; its greatest breadth is about 50 miles. The total area is computed at 1896 square miles. Two great mountain ranges, traversing the whole country from N. to S. parallel to each other, occupy by far the larger portion of the surface. The eastern range, rising in the district of Thyreatis and terminating in Cape Malea, was called Parnon; the western, an offshoot of the great mountain system of Arcadia, and ending in Cape Tænarum or Matalan, was called Taygetus. The former of these is not so much a continuous range as a series of mountains, sometimes isolated and sometimes in groups. The height specially known as Parnon (now called Malevo) touched the confines of Argolis and Arcadia. Its elevation is now ascertained to be 6355 feet. The eastern slope of this range sinks down gradually into the plain, and sends off spurs of hills and gentle rising grounds towards the sea. Its western declivity is much more bold and precipitous. Proceeding southwards, the highest peaks of Parnon are known under the special names of Barbothes, Olympus, Ossa, Thor-nax, and Menelaion. None of these, however, is remarkable either for height or picturesqueness of outline. In the southern half of the chain, the most remarkable group is that of Zarax, of which the highest point is about 3500 feet above the sea. In striking contrast to Parnon is Taygetus, whose splendid masses are as much admired in modern as in ancient times. The classics, both Greek and Roman, abound in allusions to its height, its imposing outline, and the savage grandeur of its scenery. Among modern travellers, Colonel Mure admits, "that, whether from its real height, from the grandeur of its outline, or the abruptness of its rise from the plain, it created in his mind a stronger impression of bulk and loftiness than any mountain he had seen in Greece, or perhaps in any other part of Europe." The highest peak of Taygetus, which reached an elevation of 7902 feet, overhung the city of Sparta. In antiquity it was called Taletum, and was sacred to the sun. Its modern name is St Elias. Five miles S. of it was Evoras, now called Paximadhi, the highest point of the range after Taletum. From this point diverges, in a nearly parallel line, a range of lower hills called Lycobuni, or Wolf's Mountain, which form the southern boundary of the Spartan plain. The southern extremity of the Taygetus, terminating in Cape Tænarum, was the country of the Maniates, who retained their independence after the rest of Greece had been subdued by the Turks. Taygetus was held sacred to Diana, probably from the fact that its great pine-forests harboured immense quantities of game, and were the favourite hunting-ground of the Spartan youth. It was rich in marble,

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Laconia.

green porphyry, and iron, all (especially the latter) of excellent quality, and extensively used by the Romans as well as the Greeks. The country enclosed between the great ranges of Parnon and Taygetus was the basin of the Eurotas, now the Basili-potamo. This river, rising on the frontier of Arcadia, flows in a nearly due south course into the Laconic Gulf, opposite the island of Cythera. The upper part of its course is through a deep and narrow valley, which, a little way below the capital, expands into what was known as the Spartan plain. At Cœnoe the valley again contracts, but farther down it widens out into the maritime plain, or plain of Helos (as it was called, from the town of Helos on the shore), and escapes through marshes and sandbanks into the sea. (See EURO-TAS.) The general aspect of Laconia was well described by Euripides, who called it "hollow, begirt with mountains, rugged, and difficult of access to an enemy." There were, in fact, only two ways (both of them very difficult) by which Laconia could be invaded. One of these led from Southern Arcadia, by Stenyclarus, into the upper valley of the Eurotas. The other lay through a pass of Parnon formed by the valley of the small river Cœnus. Both of these passes debouched upon the Spartan plain close to the capital. On the west the great mass of Taygetus presented an insurmountable rampart against a foe. The sea-board was devoid of harbours, and the navigation of the Laconian Gulf was so difficult that no ships could approach the shore. The entrance to the gulf was guarded, moreover, by the island of Cythera, and by the naval station of Gythium on the opposite coast. The soil of Laconia cannot vie with the rich lands of the Messenian plain. Euripides describes it as "possessing much arable land, but difficult to work." This account agrees with that of Colonel Leake, who says that the soil is in general a poor mixture of white clay and stones, difficult to plough, and better suited to olives than corn. The olives of the Spartan plain are at this day preferred to those of Athens; while the silk grown there is the best in Greece. The climate, except on the sea-coast, where the swamps engender the malaria, is excellent, and the inhabitants are taller, healthier, and stronger than any of the other Greeks. Though there are no traces of any volcanic action in the country, it has suffered severely at different times from earthquakes. The most terrible of these was that of B.C. 464, in which enormous masses of rock were rolled down from the top of Taygetus. The city of Sparta was laid in ruins, five houses only remaining uninjured, and more than twenty thousand citizens were killed.

Laconia, which at one time, according to Strabo, contained a hundred cities, had in his day no more than thirty, and of these few but the capital were of any importance. In the Spartan plain the most prominent besides Sparta were *Amyclæ* and *Pharis*, both on rising grounds near the Eurotas, and not far from each other. The most ancient of these was Amyclæ, the old residence of the Achæan kings, and memorable for its numerous and splendid temples. One of these, that of Apollo, was noted as the most sumptuous building in Laconia. *Messapeæ*, *Bryseæ*, and *Harpheia*, were mere villages. In the upper valley of the Eurotas were *Pellana*, the frontier fortress, *Belemina*, *Tripolis*, *Ægys*, which latter, with its territory, belonged at one time to Arcadia, but at an early period was incorporated with Laconia, and *Sellasia*, a fortified town commanding the valley of the Cœnus. In Southern Laconia, besides Gythium, the naval arsenal of the Spartans, were *Croceæ*, with famous quarries of marble and porphyry, *Helos* (see HELOS), *Asopus* or *Cyparissia*, *Nymphæum*, *Sida*, and *Epidaurus Limeræ*. The most important of these will be found described under their respective heads. Few of them were other than mere villages.

The original inhabitants of Laconia are said to have been the Leleges, whose first king, Lelex, was succeeded at his death by his son Myles, and he in turn by his son Eurotas,

who gave his name to the river that flowed through the Spartan plain. His daughter Sparta, married Lacedæmon son of Jupiter and Taygeta, and the dynasty founded by them kept the throne till a short time before the Trojan War, when Menelaus, having married Helen, the daughter of Tyndareus, the last monarch of the old line, became king of the country. Tisamenus, the grandson of Menelaus, was reigning at Sparta when the Dorians invaded and conquered the Peloponnese, under their kings Procles and Eurysthenes. The conquerors divided Laconia into six districts, to each of which they appointed a chief magistrate with the title of King. It was not, however, till about the middle of the eighth century B.C. that the Spartan Dorians obtained undisputed possession of the whole of Laconia. They had no sooner done so, than they cast a covetous eye on the richer plains of their Messenian kinsmen and neighbours. It was not difficult to pick a quarrel with a people hardly less warlike than themselves. The first Messenian war broke out in B.C. 743, and lasted till B.C. 754; the second, beginning in B.C. 685, and ending in B.C. 668, terminated in the complete subjugation of Messenia. The conquered country was absorbed in that of the victors, and its name does not again occur in history till its independence was restored by Epaminondas. The frontier lands of Laconia on the north, comprising the upper valleys of the Eurotas and Cœnus, and the districts of Sciritis, Belemnatis, &c., originally belonged to Arcadia. They were finally annexed by the Spartans about B.C. 600, who, however, were never able to push their conquests any further in this direction. For the remaining history of Laconia, see GREECE, SPARTA, &c., &c.

LACONICISM is the name given to a short pithy mode of expression, regarded as characteristic of the natives of Laconia. We have many historical instances of its use among that people amounting even to affectation. Thus, when Philip of Macedon wrote that, "If he entered their territory, he would destroy all before him with fire and sword," they simply returned for answer,—"If." The famous letter of Cæsar to the senate, "*Veni, vidi, vici*," is an example of the laconic style, which is still preserved in armorial devices, monumental inscriptions, proverbs, &c., &c.

LACTANTIUS, LUCIUS CÆLIUS FIRMIANUS, was, according to the common account, born at Firmium in Italy about the middle of the third century. After he had studied at Sicca Venerea in Africa, under Arnobius the celebrated teacher of rhetoric, at the request of Diocletian he settled, about A.D. 301, at Nicomedia, in Bithynia, and there opened a school for Latin eloquence. Being, however, unsuccessful as a teacher, he abandoned his favourite study of rhetoric, and became author by profession. His conversion to Christianity about this period was probably the chief cause of the extreme poverty under which he struggled, even after the accession of Constantine, when he was summoned to Gaul to act as tutor to Crispus, the eldest son of the Emperor. Lactantius died at Treves about A.D. 325.

The theological works of Lactantius, still extant, are,—*Divinarum Institutionum libri vii.*, containing an exposure of the error and absurdity of pagan idolatry and philosophy, and a vindication of the truth and purity of Christianity; *De Ira Dei*, written against the Epicureans in support of the doctrine of rewards and punishments; *De Opificio Dei*; and *De Mortibus Persecutorum*.

As a Latin prose-writer, Lactantius is second only to the writers of the Augustan age; and of all who have imitated the graceful and energetic eloquence of Cicero he has been the most successful. In theology he is more rhetorical than logical, fonder of the dogmas of heathen philosophy than of the doctrines of the gospel, and therefore very unsafe as a teacher of Christianity.

LACTHO, a province of India beyond the Ganges, tributary to the sovereign of Cochin-China. It is bounded

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Ladak. S. by Lars, N. and E. by Tungquin, and W. by China. This territory has been but imperfectly explored by Europeans; but it is described by the Tungquinese as mountainous, rocky, covered with jungle, and destitute of navigable rivers, with a singularly pestilential air, and water very unwholesome, though the climate is cooler than that of Tungquin. The interior is inhabited by numerous tribes, little better than savage, governed by hereditary chiefs, and perpetually at war with each other. Salt is imported into this country from Tungquin; also salt-fish, oil, and some silk stuffs for the chiefs. The exports to Tungquin are chiefly buffaloes and cotton. Shells and cowries form the medium of exchange. According to information derived from the Tungquinese, this province contains many extraordinary natural caverns, which appear to have served the natives as temples. One cavern is described as a mile across, perforating a mountain, and another as being entered under ground in a boat.

LADAK, or MIDDLE TIBET, a very elevated and rugged country of central Asia, N. of the Punjab, and lying between N. Lat. 32. 25. and 35. 10., and E. Long. 75. 30. and 79. 10. It is bounded N. by the Karakoram Mountains, which separate it from the Chinese territory of Kotan, E. and S.E. by the Chinese districts of Rudok and Chumurti; on the S. it includes the districts of Lahul and Spiti, now attached to British India; and on the W. it is separated from Kashmir by the western Himalaya chain, and from Balti by an imaginary line drawn from the mouth of the Dras to the sources of the Nubra. Its greatest length from N.W. to S.E. is 240 miles, and its greatest breadth 190; but, from the irregularity of its outline, its entire area is little more than 30,000 square miles. The territory of Ladak is one of the most elevated regions of the globe. The great valley of the Indus traverses the country through its entire length from S.E. to N.W. On each side of the valley are several parallel ranges of mountains, some of which are calculated to rise to the enormous height of above 29,000 feet. These determine the course of the rivers, and furnish a system of divisions for the country. These divisions are,—1, at Nubra, on the Shayok; 2, Ladak Proper, on the Indus; 3, Zanskar, on the Zaskar River; 4, Rukchu, along the lakes of Tshomo Riri and Tsho-Kar; 5, Purik, and Suru, and Dras, on the different branches of the Dras River; 6, Spiti, on the Spiti River; and 7, Lahul, on the Chandra and Bhaga, or head waters of the Chenab. The first five are subject to Gholab Singh, and the two last belong to the East India Company.

The following table gives the area and mean elevation of the inhabited parts of the different districts:—

	Area in Square Miles.	Mean Height.
Nubra.....	9216	12,763
Ladak.....	3960	11,500
Zanskar.....	3080	13,154
Rukchu.....	5580	15,634
Purik, Suru, Dras.....	4200	11,196
Spiti.....	2312	12,986
Lahul.....	1872	11,063
	30,220	12,613

The great river of Ladak is the Indus. Its principal affluent is the Shayok, which rises in the Karakoram Mountains in N. Lat. 35, E. Long. 78. Its course for about 150 miles is generally in a S.E. direction, when it turns suddenly to the N.W., and continues a W.N.W. course to its junction with the Indus at Keris. Its length is about 400 miles. The Zanskar, a dark and turbulent torrent, falls into the Indus at Nyimo, 25 miles below Lé, after a northerly course of 210 miles. About 25 miles above its mouth it receives the Sum-gal, which has a N.N.W. course of 110 miles. At Moral, 125 miles below Lé, the Indus receives on the left the Dras, which is about 85

miles in length. There are also numerous lakes, the principal of which is Pankong, a long narrow sheet of extremely salt water, not less than 85 miles in length, with an average breadth of 3 miles. The great mountain ranges are generally of primary formation—granite, gneiss, and mica-slate. Lead, copper, and iron ores have been discovered; and gold is found in the sand of several of the rivers. Sulphur, soda, and borax are obtained in certain parts.

The climate of Ladak is characterized by great extremes of heat and cold, and by excessive dryness. In the elevated district of Rukchu it freezes almost every night during summer, but the noon-day sun is several degrees hotter than in most parts of India. The quantity of rain and snow that falls is, owing to the great lack of moisture in the atmosphere, exceedingly small. In the more elevated districts of Rukchu, Nubra, Zanskar, and Ladak Proper, it rains, or rather drizzles, for an hour or two, three or four times in a year. Snow falls much oftener, but not in any quantity, and in Ladak and Rudok it is never more than six inches deep. This aridity of climate renders artificial irrigation necessary in cultivation, and hence the cultivated land is only to be found along the courses of the rivers and streams. The waters of the smaller streams are arrested by dams, and conducted with great skill from field to field, and from terrace to terrace. The grain crops are wheat, barley, and buckwheat. The esculent vegetables are carrots, turnips, onions, cabbages, and radishes. Caraway, mustard, linseed, and tobacco, are cultivated to a small extent. The timber trees are few and unimportant. The most common are poplars and willows, which are planted round every village. Less common are the pencil cedar, the *Elaeagnus Moorcroftii*, and a kind of tamarisk. The fruit trees are the apple, apricot, walnut, mulberry, and vine. The rhubarb of medicine grows in great profusion, and of the finest quality.

The wild animals are numerous. The elevated plains of the Indus, and the lofty table-lands of Rukchu, abound with the horse, marmot, and hare, while the snowy mountains and rugged glens teem with many varieties of the wild goat, sheep, and deer. Other wild animals are the leopard, bear, wolf, fox, ounce, lynx, jackal, and weasel. The domestic quadrupeds are horses, yaks, cows, asses, goats, and dogs. The goat furnishes the fine wool of which the fine Kashmir shawls are made. Birds are not numerous. The *chakor* is a bird resembling a partridge, but of the size of a guinea hen. The eagle, kite, and raven, are common, as are also smaller birds, as the sparrow, linnnet, redbreast, and lark. Waterfowl abound on the lakes. The rivers teem with fish, which the superstition of the natives does not allow them to molest.

The manufactures of Ladak are few, rude, and unimportant, being chiefly coarse woollens for home consumption. The country furnishes few articles of trade, almost the only exports being wool, borax, sulphur, and dried fruits. The transit trade, however, is very large, owing to its position between Kashmir and India on the S. and S.W., and the Chinese provinces of Yarkand, Kotan, and Kashgar, on the N. and N.E.

Ladak is inhabited by a peculiar race of people, considered in features and language to bear a considerable resemblance to the Chinese. The population is estimated at 168,000.

The professed religion is Lamaism. The deity is worshipped in the character of a trinity, but adoration is paid to a great number of inferior beings, represented by a variety of curious idols. Among the social institutions of the country the most remarkable is the system of polygamy that prevails among the poorer classes. A family of brothers has only one wife in common, who will thus not unfrequently have three or four husbands. The system, however, is strictly confined to brothers. The

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rich, as in all eastern countries, have generally several wives. Previous to the conquest of the country by the Sikhs, the government was a simple despotism, administered by the Rajah, according to the direction of the influential Lamas. Gholab Singh invaded the country in 1835, and annexed it to the dominions of his master Runjeet Singh. He now retains the acquisition as a portion of the principality which was assigned to him by the British after the conquest of the Punjab. (See Cunningham's *Ladak*.)

LADOGA, a lake in Russia, the largest in Europe, lies between the governments of Viborg on the N. and W., Petersburg on the S., and Olonetz on the E. Its greatest length is about 130 miles, breadth above 70. The coast is generally low, much indented, and abounding in dangerous reefs. The depth in some places reaches about 150 fathoms, in others it is insufficient for safe navigation. Storms are frequent, and the influx of many considerable streams produces strong currents. The chief rivers entering the lake are the Swir (or Sveer) from the E., bearing the waters of Lake Onega; the Volkhoff on the S.; those of Lake Ilmen and the Saima on the N., draining the reticulation of waters of that name. It empties itself on the S.W., by the Neva, into the Gulf of Finland. There are numerous islands scattered along the north-western shore, several of them inhabited. The principal towns on the coast are Kexholm, Schlusselfburg, and Novaia Ladoga. A canal executed in the reign of Peter the Great connects the two latter, forming a direct communication between the Neva and Volkhoff.

LADRONE, or MARIANNE ISLANDS (so called respectively from the thievish habits of the natives, and in honour of Queen Mary Anne of Spain), a group in the N. Pacific Ocean, between Lat. 13. and 21., Long. 144 and 146. They are about twenty in number, of volcanic origin, irregular and picturesque in outline, and clothed with luxuriant vegetation. The intervening straits abound in shoals and currents, and there are few good harbours. The heat of the climate is somewhat tempered by the trade-winds. Among the vegetable products are sugar, rice, Indian corn, tobacco, cotton, indigo, &c. Of wild animals, the most numerous are swine, sometimes of large size; cattle, horses, asses, mules, and llamas, have been introduced by the Spaniards. The principal island is Guajhan, or St John, the most southerly of the group. It is about 80 miles in circumference, and has a good fortified harbour, some miles to the S. of St Ygnacio de Agaña, the seat of government. The aboriginal inhabitants, an active and athletic race, have gradually given place to a mixed population, descended of colonists from Mexico and the Philippine Isles. This group was discovered in 1521 by Magellan; but no settlement was made in them for about 150 years, when the widow of Philip IV. sent out a body of missionaries to convert the natives. They were visited in 1742 by Anson, who spent some time on the island of Tinian, where he discovered architectural remains, indicating a considerable progress in the arts of civilization. (See POLYNESIA.)

There are two other small island groups of this name, the one on the coast of China, at the mouth of the bay of Canton, a great stronghold of pirates, the other off the coast of Guatemala.

LADY, a word of Saxon origin, generally supposed to signify loaf-giver, the first part of the word *klaf*; a loaf, being preserved in the Saxon *klaford*, a lord. In ancient times it was the practice of the *lady* of the manor to distribute bread to the poor with her own hands at stated times. Tooke, however, derives the term from the verb *hlifian*, to raise, and thus regards it as denoting a person raised to equality with her lord. Both derivations are honourable to our Saxon ancestors. As a title it belongs to the daughters of all peers above the rank of a viscount, but is extended by courtesy to the wives of knights.

LADY-Day an immovable feast celebrated on the 25th of March, or the annunciation of the Holy Virgin.

LÆLIUS SAPIENS, C., was the son of C. Lælius Nepos, and distinguished by his love of philosophy in an age when war still continued to be regarded as the only employment worthy of a Roman. He was the pupil of Diogenes the Stoic, and afterwards of Panætius. (Cic. *Fin.* ii. 8.) He was the intimate friend and companion of Scipio Africanus the younger, and attended him in his expedition into Africa when he took Carthage, B. C. 146. (Appian. *Pun.* 126.) He was then employed as prætor in Lusitania, where he obtained considerable advantages over Viriathus. (Cic. *Off.* ii. 11.) He was elected consul along with Servilius Cæpio (B. C. 140); but notwithstanding the able manner in which he discharged the duties of the office, he did not succeed in being re-elected, a circumstance which Cicero laments in most feeling language. (*Tusc.* v. 19.) Lælius spent much of his time in the country, devoting himself partly to rural occupations, and partly to study. The mildness of his disposition, and the equanimity of his temper, are noticed by Horace, when he speaks of *mitis sapientia Lælii* (*Sat.* ii. 1). He was the intimate friend of Pacuvius and Terence; and it is said that he and Scipio assisted the latter in the composition of some of his plays. It was no doubt his friendship with Scipio that induced Cicero to place the name of Lælius at the head of his beautiful essay *On Friendship*. The interlocutors are Lælius himself, and his two sons-in-law, C. Fannius and Q. Mucius Scævola.

LAENNEC, RÉNÉ THÉOPHILE HYACINTHE, the discoverer of mediate auscultation, was born at Quimper, in Lower Brittany, February 17, 1781. After going through the usual course at the chief school in the department of the Loire Inférieure, he began the study of medicine under the care of his paternal uncle, a distinguished physician at Nantes. In 1799 he acted for a short time as assistant surgeon in the military hospitals then established in that city. Removing to Paris in the following year, he attached himself to the clinical school in the great hospital of La Charité, at that time under the direction of the celebrated Corvisart. Among his fellow-students were Double and Bayle. Even thus early he began to make himself known by his occasional essays and pamphlets, and by his contributions to the *Journal de Médecine*. He graduated in 1804. In the same year he became editor of the *Journal de Médecine*, and continued to enrich its pages with many learned and original papers, chiefly on morbid pathology, till bad health compelled him to resign his office. His intention at this time was to have published a complete work of morbid anatomy, on which he had lectured publicly for some sessions at Paris. He did not live to carry out his plan; but portions of the work were published as separate articles in the *Dictionnaire des Sciences Médicales*. Meanwhile his practice was keeping pace with his widening fame; and in 1816 he was appointed chief physician to the Hôpital Necker, the duties of which he undertook with his usual zeal and activity, and in which he was speedily rewarded for all his labours by his great discovery. For two years after the idea first dawned upon him he devoted himself with astonishing perseverance to perfecting the new system of diagnosis which he founded on it. By June in 1818 he had advanced so far as to read a memoir before the Academy of Sciences, containing the outline of his method, and in the September of the following year he published his remarkable work, under the title of *De l'Auscultation Médiate, ou Traité du diagnostic des Maladies des Poumons et du Cœur, fondé principalement sur ce nouveau moyen d'exploration*. The profession, especially the elder members of it, received the work with distrust; and but for the admirable descriptions of diseases contained in it, and giving it a value independent altogether of the system of diagnostics, his discovery might have fallen into temporary oblivion. Fortun-

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ately, however, Laennec had many zealous friends among his own students, who diffused a knowledge of the new method, not only in France, but in other countries of Europe.

Meanwhile, the labour involved both in observing and redacting the results of his observations had very nearly proved fatal to Laennec. He was physically very small and puny, and his intense application had now broken his health, both of mind and body. Relinquishing his valuable practice, and all his appointments, he retired to a country-house of his own near his birth-place. He was not long of recovering his health and spirits, but he was very unwilling to return to Paris. However, in the autumn of 1821 he did return, and besides renewing his duties at the Necker Hospital, became private physician to the Duchess of Berri, and professor of medicine in the College of France. When the college was reconstituted in the following year, he was appointed to the chair of clinical medicine. His health again began to give way, and the art which he had himself discovered warned him that he was falling a prey to pulmonary consumption. After seeing through the press the second edition of his great work, he again retired to his native town. At first he seemed to benefit by the change; but the disease had gone too far to be arrested, and he died August 13, 1826, in the forty-fifth year of his age.

Though it was as the inventor of the stethoscope that Laennec became known in his own day, and wished to be known by posterity, that invention is not his only or his greatest title to posthumous fame. Its invention was indirectly invaluable, as it led Laennec to make diseases of the chest his special study. These pathological inquiries of his yielded results more beneficial to mankind than any discovery in modern medicine, except vaccination. Diseases of the chest, which before Laennec's time had been very little understood, are now diagnosed by mediate or immediate auscultation with an accuracy as faultless as those which show themselves on the surface of the skin. Though he had a large and lucrative practice, Laennec does not seem to have been highly esteemed as a physician, and the therapeutical portions of his work are the least satisfactory. It was as a pathologist that he was distinguished above most of his contemporaries.

His great work has been translated into most of the European tongues. The English translation, by Dr John Forbes of Chichester, is preceded by a life of Laennec, compiled from two biographies by Kergaradec and Bayle.

LÆSTRYGOÑES, a fabulous race of giants, whose name is often found in the Greek myths. They are first mentioned in the *Odyssey*, where they are described as a pastoral people, governed by a king called Lamus. Homer assigns them no site, but tradition placed them in the island of Sicily. Their exact locality in that island varied with the fancy of the writer. The current story is that they dwelt near Leontini, and that from this circumstance the rich plains adjoining that city came to be called the Campi Læstrygonii. The version most popular at Rome was that they lived on the Latian coast around Formiæ, which was represented as their capital.

LAFAYETTE, GILBERT MOTTIER, was born at Chavagnac, in Auvergne, Sept. 6, 1757, and educated at the Parisian College of Louis le Grand. At the age of 20, and only three years after his marriage with the granddaughter of the Duc de Noailles, he left France to assist the Americans in the war of independence; and fought as a volunteer at Brandywine. Shortly after, equipping 2000 infantry at his own expense, he signalled himself at the capture of New York. On the close of the war he returned to France; in 1787 became a member of the Notables; and, during the revolution of 1789 sat in the National Assembly, where he proposed the famous "Declaration of Rights." Having been appointed commander-in-chief of the National Guards, he was present at the attack upon Ver-

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sailles, and saved the lives of the royal family. In 1790, after organizing the Club of Feuillons, and defending the king from popular fury, he retired to his estates. In the war of the coalition, in 1792, he was one of the three major-generals in command; but losing his popularity on account of his moderate opinions, he was compelled to flee from France, and fell into the hands of the Austrians, who imprisoned him at Olmutz. He was liberated along with the other prisoners in 1797. During the ascendancy of Bonaparte, Lafayette declined all public offices until the emperor's return from Elba, when he accepted a seat in the House of Representatives. This body, at his instigation, attempted to continue sitting after the disaster at Waterloo, but was dissolved by military force, and Lafayette returned to his retirement. He visited the United States in 1824. In 1830 he commanded the National Guards, and was instrumental in raising Louis Philippe to the throne. He died in 1834.

LAFAYETTE, a town of the United States of North America, capital of Tippencanoe county, Indiana, on the left bank of the Wabash River, 66 miles N.W. of Indianapolis, and 123 miles S.E. of Chicago. It stands on a rising ground, which slopes gradually to the water side, and affords extensive views of the surrounding country. Its chief trade consists in cast-iron, paper, and pork. The prosperity of Lafayette is greatly owing to its easy communication with the Mississippi valley and the lakes of Michigan and Erie. The Wabash and Erie Canal passes through the town, while by rail it is connected with Indianapolis, Lake Michigan, &c. Pop. (1854) about 8000.

LAGONEGRO, the capital of a district of the same name, in the province of Basilicata, kingdom of Naples, is situate at the head of a narrow glen, everhung by the heights of *Monte Cocuzzo*, *Monte del Papa*, and *Monte Sirino*. Close beside the town is a battle-field where Regnier, one of Joseph Bonaparte's generals, defeated a detachment of the Neapolitans. Pop. 5000.

LAGO MAGGIORE, or **LAKE OF LOCARNO** (*Lacus Verbanus*), a lake in the north of Italy, touching Lombardy, Piedmont, and the Swiss canton of Ticino. Average breadth 2 miles, length 40 miles. Its basin in some places is of the depth of 438 fathoms, and is fed by the Toce on the W., the Ticino on the N.E., and the Fresa on the E. The chief islands are the Borromean. Merchant-vessels engaged in the timber trade traverse its waters; and steam-packets ply regularly between Magadino and Sesto Calende. The lake abounds in fish, and its shores in fine marble quarries.

LAGOON (*Lacuna*, a ditch), the name given to numerous creeks extending along the Adriatic in the government of Venice. In some places they are deep, but generally so shallow as to cause noxious and offensive exhalations. The lagoons are studded with islets, on sixty of which Venice is built. See **VENICE**.

LAGOS, a seaport-town of Portugal, province of Algarve, about 20 miles E. of Cape St Vincent. Pop. about 7000, mostly engaged in the tunny and sardine fishery. In the Bay of Lagos, August 18, 1759, a signal victory was won by Admiral Boscawen over the French Toulon fleet under De la Clue.

LAGOS, a country of Western Africa, between Dahomey and Benin. The capital, Lagos, a place of considerable population, was long one of the principal ports of the slave-trade. In November 1851, a small British force attacking the place was repulsed with loss; about a month later a better organized assault resulted in the reduction of the town and the capture of 57 guns. A treaty securing the abolition of the slave-trade, and other important benefits, was concluded soon after.

LAGOSTA (the ancient *Lastobon* or *Ladestris*), an island in the Adriatic, off the coast of Dalmatia, belonging

Lagrange. to Austria, 63 miles W.N.W. from Ragusa. Its length from E. to W. is 6 miles, and its breadth 3 miles. Its coast is guarded by steep cliffs, indented by several well-sheltered creeks, while its interior is very mountainous. It is surrounded by a number of smaller islands, the principal of which are, the group called the Lagostini on the E., and the Island of Marciara on the W. Its north side is the village of Lagosta. The soil produces wine and oil, but only for home consumption. Pop. 1200.

LAGRANGE, JOSEPH LOUIS, a mathematician and astronomer of the first rank, born at Turin on the 25th of January 1736, was the son of Joseph Louis Lagrange, treasurer at war, and Maria Theresa Gros, only daughter of a rich physician at Cambiano.

He was the eldest of eleven children, but nine of them died young. His family was of French extraction on both sides; and his French biographers have dwelt with pleasure on the minute particulars of their emigration, in order the more fully to authenticate their own claim to the honour of calling him their natural as well as adopted countryman. It was his great-grandfather that first settled at Turin, in the service of Emmanuel II., who married him to a Roman lady of the family of Conti. They had at one time acquired considerable affluence, but his father had ruined himself by his expenses and speculations; and Lagrange used frequently to observe, that he owed his own success in life to his father's misfortunes, since, if he had been rich, he should never have applied to the mathematics as a profession. The classics were at first his favourite study at the college of Turin; he began his scientific education with reading the works of the ancient geometers, and at first preferred their methods of investigation to the more modern analysis; but being convinced, as it is said, by a paper of Halley in the *Philosophical Transactions*, of the superiority of the algebraical mode of representation, he applied with redoubled ardour, at the age of seventeen, to the study of the later improvements in the methods of investigation; and in his subsequent works he abandoned, wherever it was practicable, all geometrical considerations, and seems to have valued himself on having produced a complete system of mechanics, free from the incumbrance of any diagram whatever. When he was only nineteen, he was made professor of geometry in the Royal School of Artillery, but not before he had exhibited, in his first publication, a specimen of the improvements which he was throughout his life to contribute to the mathematical sciences.

The friendships which he formed with his pupils, most of whom were his seniors, led to the establishment of a society which afterwards received the sanction of the royal authority, and to the publication of their memoirs, in which Lagrange not only took the most active part as a contributor of original papers, but also by materially assisting in the demonstrations of Foncenex, and promoting the researches of Cigna and Saluces. Foncenex was soon rewarded by being placed at the head of the maritime establishment which the king was then forming; and Lagrange received in a short time a still more flattering remuneration, in the panegyrics which were liberally bestowed on him by his great rivals, Euler and D'Alembert; the former procured him, in 1759, the compliment of being made a foreign member of the Academy of Berlin, having become well acquainted with his merits by an epistolary intercourse, which began as early as the year 1754, when Lagrange communicated to him his first ideas of the solution of isoperimetrical problems, which Euler had the delicacy to allow him time to complete, before the publication of his own further researches on the subject.

In 1764 he obtained a prize from the Academy of Sciences at Paris, for a memoir on the difficult subject of the libration of the moon, having treated it by an original method, derived from the principle of virtual velocities, which

he afterwards applied so successfully to other branches of mechanics. Soon after this time he found an agreeable relief from the monotony and retirement of his life at Turin, in accompanying his friend the Marquis Caraccioli, who was appointed ambassador at the court of London, as far as Paris, where he had the delight of becoming personally acquainted with a number of the most distinguished mathematicians of the age, who were capable of appreciating his merits, especially with Clairaut, D'Alembert, Condorcet, Fontaine, Nollet, and the Abbé Marie; but indisposition prevented his going on to England, as he had intended, and he returned to Turin after a short stay in France. A second prize, on the subject of the satellites of Jupiter, was awarded him in 1766; and the same tribute was again paid to his merit on three subsequent occasions. It was in this year that he was invited to Berlin, as a successor to Euler in the place of mathematical director of the academy, Euler having been induced to remove to Petersburg, by a better prospect of providing for his numerous family. The appointment of president of the academy, held by Maupertuis, had been given but in part to Euler; the whole was offered to D'Alembert, who declined it; but both he and Euler united in recommending Lagrange as the fittest person for the situation. It was, however, with some difficulty that he obtained his sovereign's leave to quit Turin; and the favour was at last granted to him partly in pique, on account of the terms of the invitation, which expressed the desire of the "greatest king in Europe" to have the greatest mathematician at his court.

At Berlin he pursued his career of study in tranquillity and without interruption, upon a competent income of about L.300 a-year, with the advantage of such demonstrations of the royal protection as were still more important than income to his rank in society. The king seems to have preferred him to Euler, as more tolerant in his opinions, though by no means joining in all the innovations of the day, and rather avoiding every discussion relating to them, as well as any great familiarity with his patron. He was made, in 1772, one of the eight foreign associates of the Parisian academy. He is said to have married more for the sake of complying with the universal custom of his friends and colleagues at Berlin, than for any desire of female society; and he invited a relation of his own from Turin, who became his first wife; but she was soon after carried off by a lingering disease. He was about this time very closely employed on his greatest and best work, the *Mécanique Analytique*; but it was with some difficulty that the Abbé Marie found a bookseller at Paris, who agreed to undertake its publication, and only upon condition of engaging himself to divide the loss, in case of failure in the sale. He also procured the valuable assistance of Mr Legendre as a corrector of the press.

Upon the death of Frederic in 1786, Lagrange no longer felt the same interest in remaining at Berlin, though he was not treated by the new court with any thing like disrespect. While the ministers of Naples, Sardinia, and Tuscany, were making him offers on behalf of their respective sovereigns, Mirabeau persuaded the French ambassador at Berlin to recommend M. de Vergennes to invite him to Paris; but it was in reality through M. de Breteuil's interest, and at the suggestion of the Abbé Marie, that he was ultimately induced to settle there in 1787, having received a grant of an income equal to that which he had enjoyed at Berlin, under the name of a veteran pensioner of the academy, with a vote in its deliberations. He was kindly received by Marie Antoinette, on account of his connection with Germany; and, until the Revolution, he had the use of apartments in the Louvre.

It was at this period of his life, when his success had been the most gratifying, and his fame had become per-

Lagrange. fectly established, that he appeared to suffer under a degree of melancholy or apathy which was absolutely morbid. He confessed that all his enthusiasm was extinguished, and that he no longer felt the least relish for mathematical researches. He had not even the curiosity for two years to open the printed volume of his *Mechanics*, which he had never seen except in manuscript. It is a consolation to think that this annihilation of his energies was only partial and temporary. He amused himself in the meantime with metaphysics, "with the history of religions" and of languages, and with medical and botanical, and especially chemical studies; and the alarms and agitations of the Revolution, which soon followed, instead of overwhelming his broken spirit, seem to have roused his dormant powers, and to have revived his satisfied ambition, exciting him to new labours and new triumphs.

In 1791 his name appeared on the list of the foreign members of the Royal Society of London. Mr Maurice has asserted, that all the scientific bodies of Europe, *except* the Royal Society, received him with open arms; if the remark was intended as a censure of that society, it is right that its injustice should not pass unnoticed.

Notwithstanding the public embarrassments which attended the Revolution, Lagrange's pension was confirmed by the National Assembly, upon the proposition of M. Dusejour, in the most flattering manner; and when the depreciation of the currency materially reduced its amount, he received a partial indemnification, by being appointed a member of a committee for examining useful inventions, and afterwards a director of the mint, in conjunction with Berthollet and Monge; but this employment he found too laborious, and resigned it six months afterwards. He was greatly interested at this period in the establishment of the new system of weights and measures; he was so violently bent on *decimation*, that he scarcely forgave Borda for having made a measure of a quarter of a metre; and he thought so little of the advantage of integral subdivisions, that he sometimes declared he should have preferred the number eleven to twelve, for the very reason that it admitted no subdivision at all, and caused all lesser quantities to be expressed in units comparable to each other only. This opinion seems, however, to have been advanced rather as an exaggerated objection to the introduction of twelve, which was suggested by some more ardent innovators, than as seriously attributing a real advantage to the employment of a prime number.

When the academics were suppressed, the Jacobins purified the commission of weights and measures by striking out the names of many of its most distinguished members, while they retained that of Lagrange, probably because he was of no political party whatever, and had always been particularly cautious in expressing his sentiments of the events of the day. In October 1793, however, a decree was passed, which ordered all persons not born in France to leave the country. Guyton, who was a member of the Committee of Public Safety, advised him to claim an exemption from its operation, by a requisition of that committee, on the pretext of his being employed in preparing a report on Dr Hutton's *Treatise on Gunnery*; and he actually received an injunction from the committee, requiring his stay, "in order to complete the calculations which he had undertaken respecting the theory of projectiles." He was attempting to reunite the experiments of Dr Hutton with a more correct theory than had before been applied to them; but he published nothing of importance on the subject. After the murder of Bailly and Lavoisier, he had agreed to return to Berlin, and to resume his former situation there; and he was on the point of obtaining a passport, and even a public mission from Hérault de Sechelles. But the establishment, first of the *Normal School*, in which he was a professor, and then of the *Ecole Polytechnique*,

induced him to remain at Paris, and again directed his activity into its ancient channels. In the Normal Schools the masters were mixed with their pupils, in order that the facilities of conversation might produce a development of the subjects discussed in the most elementary manner that was possible; but the conversation was by no means supported in the form of incessant questions and answers; Lagrange's explanations were often interrupted by moments of silence, in which his inventive faculties were deeply engaged in reflection, and the whole of his powers were concentrated on a new train of ideas. It was amidst these discussions that the *Theory of Analytical Functions* originated, a work certainly not destitute of the marks of great mathematical talent, but which, when considered as a substitute for the method of fluxions and its kindred doctrines, resembles very much the suggested introduction of an undecimal in preference to a duodecimal scale of notation, with which the author had before amused himself.

Upon the re-establishment of the Institute, Lagrange was made one of the original members; and he was the first on the list of the Board of Longitude, which was then first instituted at Paris. He received about this time a compliment highly grateful both to his love of fame and to his filial affection, in the person of his father, then past ninety, and continuing to reside at Turin. By the direction of Talleyrand, who was minister for foreign affairs, the commissary of the directory of Piedmont, attended by the generals of the French army, and several other persons of distinction, went in procession to congratulate this venerable person on the merits of his son, whom he had not seen for more than thirty years, whom they declared "to have done honour to mankind by the brilliancy of his genius, and whom Piedmont was proud to have produced, and France to possess as a citizen." The old man lived to the age of ninety-five, and was sincerely regretted by his son.

Under the consular and imperial government, Lagrange was made a senator, a grand officer of the legion of honour, a count of the empire, and a knight grand cross of the order of reunion, in addition to the personal marks of friendship and intimacy which Bonaparte habitually conferred upon him at the meetings of the Institute, and on other occasions.

He applied with so much zeal to the republication of the first part of his *Mechanics* in 1811, and of his *Analytical Functions* in 1813, that his health is supposed to have suffered from the fatigue; which, in conjunction with a predisposition, not uncommon in advanced life, may very possibly have been the immediate cause of a fit that attacked him in the beginning of the latter year. In the month of March he was subject to frequent returns of fainting, accompanied by some fever. On the 8th of April he had a last conversation with Lacépède, Monge, and Chaptal, all the parties being aware that it was to be the last. He felt the approach of death, but he declared that it was in that form neither painful nor even disagreeable. He spoke with proper gratitude of the favours he had received from Bonaparte, who afterwards provided very liberally for his widow and his brother. The interview lasted more than two hours; and though his memory often failed him with respect to names and dates, yet his language was correct and energetic. He survived this effort only two days, and died on the morning of the 10th April 1813. He was buried at the Pantheon, or the church of St Gèneviève, and his friends Lacépède and Laplace paid the last honours to his memory in a funeral oration.

Lagrange was habitually of delicate health, and extremely temperate in his diet and mode of life, limiting his food almost entirely to vegetables, and taking his exercise very punctually in the open air. At the age of fifty-six he mar-

Lagrange married the young and handsome Madlle. Lemonnier, who appears to have felt the splendour of his celebrity and the goodness of his heart, as affording much more than a compensation for the great inequality of their ages. He was deeply sensible of her affectionate attachment, which he considered as the greatest happiness of his life, and on account of which alone he regretted its termination. He had no children, and he was perfectly contented to be without them. In the midst of the most brilliant societies he was generally absorbed in his own reflections; and especially when there was music, in which he delighted, not so much for any exquisite pleasure that he received from it, as because, after the first three or four bars, it regularly lulled him into a train of abstract thought, and he heard no more of the performance, except as a sort of accompaniment assisting the march of his most difficult investigations, which he thus pursued with comfort and convenience. He was less fond of the theatre, from which he often returned without knowing what piece had been represented. His manner in conversation was gentle and timid; he was more in the habit of interrogating than of giving his opinion, and his favourite expression was, "I don't know" . . . He was not, however, easily induced to change his sentiments when they were once fixed, having generally adopted them upon mature consideration. As a writer, whenever any controversy occurred, he was always calm in defending himself, and respectful in speaking of his antagonists. Notwithstanding that his person was striking and characteristic, as well as pleasing, he would never consent to have his portrait painted, thinking it unworthy of a man of intellectual excellence to wish to be remembered for the external form of his features. But a sketch of him was once obtained by stealth at a sitting of the Institute, and a mask of his face was taken after his death. His works bear witness, that for fifty-four years he occupied either the first or very nearly the first place among all the mathematicians of his age and of all ages. "Of all the inventors," says Laplace, "who have the most contributed to the advancement of human knowledge, Newton and Lagrange appear to me to have possessed in the highest degree that happy tact, which enabled them to distinguish general principles among a multitude of objects enveloping them, and which is the true characteristic of scientific genius. This tact, in Lagrange, was united with a singular elegance in the method of explaining the foundations of the most abstract truths of analysis." Lagrange was a great admirer of Euler, who perhaps excelled him in the adroitness with which he employed the most refined artifices of calculation, though his views and methods were less original and less powerful. D'Alembert was highly esteemed by Lagrange, as a man of abundant ingenuity and talent, though less accurate in his conclusions, and in his modes of reasoning, than either Euler or Newton. Newton he envied almost as much as he admired, for having found a system of the world in existence, and the principles of its modification not yet understood; but when it is remembered that the places of the heavenly bodies are now ascertained to seconds more nearly than they were to minutes during the life of Newton, it cannot be thought that Newton left too little for his successors to accomplish.

1. His first publication, at the age of eighteen, was a Letter to C. J. Fagnano, 23d June 1754. It contains series for fluxions and fluents of different orders, somewhat resembling the binomial theorem of Newton.

2. The series of his papers in the *Miscellanies of Turin* is continued from 1759 to 1786. The first is on Maxima and Minima, *Misc. Taur.* i., 1759, p. 18. It is founded on the principles laid down by MacLaurin, and is illustrated by the case of the successive transmission of an impulse through a series of elastic bodies, comprehending the combination of a number of variable quantities. 3. On an Equation of Finite Differences, and on the Theory of recurring Series, p. 33. The equation is resolved by an exponential integral, and the sum of the series is obtained by the principles of fluxions; the same mode

of calculation is also applied to the laws of chance. 4. Researches on the Nature and Propagation of Sound: end of the volume. The investigations of Taylor and of Newton were true and correct as particular solutions only of the problems of chords and of undulations, though mistaken for general solutions, and as such successfully combated by Cramer, whose reasoning, though certainly too far extended, is here approved by Lagrange. Daniel Bernoulli very successfully defended them both, not only as particular solutions, but as capable of being rendered universal by proper modifications and combinations. Euler had proposed a more general construction for the case of chords; D'Alembert insisted that this method required a limitation to figures exempt from angles and from abrupt changes of curvature, and Lagrange is inclined to admit his exceptions. But after all, the question is merely a metaphysical refinement, since no abrupt changes can ever occur in the actual form of a chord; and a chord affording a harmonic of unlimited acuteness will approach without limit to a mathematical angle. The author begins, in this essay, with considering the motions of a finite number of bodies, and then proceeds to the affections of a fluid, which he reduces to the same equations as are applicable to the motions of chords, and these he integrates in D'Alembert's manner. He lastly examines the phenomena of the grave harmonics observed by Tartini, and explains them very satisfactorily from the analogy of the beats of discordant sounds. 5. New Researches on Sound, *Misc. Taur.* ii. 1760-1, p. 11. The same subject is here continued, and extended to the divergence of sound, which had before been examined by Euler. The author now admits that there is no inconsistency in the demonstration of Newton and Cramer, which deduce the same velocity from different laws of the supposed motion, since the velocity is really uniform in all cases. The oscillations of a heavy chain are computed, and some remarks are made in conclusion respecting the sounds of flutes. 6. On the Maxima and Minima of Indefinite Integrals, p. 173. This essay contains the foundation of the method of independent variations, which has excited so much attention, for the universality of its application and the utility of its results. It was received with distinguished applause by Euler, as fulfilling his own wishes for the extension of a similar method; and it was Euler who more fully explained its principles, and gave it the name of the method of variations, which has since been generally applied to it. In fact, however, the foundation of the method had long before been laid by Leibnitz, under the name of differentiation from curve to curve; and he had proved that the process of integration, with respect to one kind of variation, might be applied to the differentials or fluxions taken in another manner, without the necessity of first obtaining the fluent: and Euler had employed this consideration in treating of the geometrical properties of curves affording maxima or minima; but his method is less simple and less general than that of Lagrange, who first pointed out the universality of the principle, that the variation of the fluxion is equal to the fluxion of the variation, and showed its utility in many cases of such integrations, as leave the expression concerned still a fluxion of another kind; and in the mechanical application of the method, he made the fluxion of the ordinate of a vibrating chord represent its inclination to the axis at any given time, whilst its variation indicated its velocity or its change of place in successive intervals of time, and the fluxion of a revolving solid to relate to the magnitude of its different parts, whilst its variation depended on its rotatory velocity. The steps of the method are generally simple and easily understood, at least they may and ought to be rendered so; but the merit of the invention is not the less because it admits of a very ready application, and because it might have occurred to a less distinguished mathematician; as indeed something nearly resembling it seems to have been employed by Fontaine in 1734, under the name of the fluxio-differential calculus, in the investigation of a tautochronous curve. 7. It was particularly in demonstrating the law which is called the law of the least action, that Lagrange completed the theory of variations, where Euler had felt its deficiency; and the Application of the Method to several Mechanical Problems constitutes the second part of the Memoir, p. 106. The author takes occasion also to correct an error of D'Alembert, who had imagined that there was no necessity that the different strata of a given density, in a body like the earth, supposed to be in a state of fluidity, should all be level, which, however, is here shown to be a necessary consequence of D'Alembert's own equations. 8. Addition to the Memoir on Sound, p. 323; admitting the difficulty raised by D'Alembert respecting the continuity of the figure of a chord, and acknowledging that the initial figure must not be supposed angular; while, in fact, as M. Fourier has lately demonstrated, and as had been remarked many years ago in this country, an infinite series of harmonic curves may approach infinitely near to two right lines meeting in an angle. 9. Problems relating to the Integral Calculus, *Misc. Taur.* iii., 1762-5, p. 179: a miscellaneous paper, containing remarks on the resolution of equations, containing fluxions

Lagrange,

Lagrange. of different orders; on some cases of the motions of fluids; on the vibrations of chords; on the properties of small oscillations in general; on loaded threads; on central forces; and on the theory of Jupiter and Saturn. 10. An Arithmetical Problem, *Misc. Taur.* iv., 1766-9, p. 44. This paper, dated at Berlin, contains a complete resolution of all equations of the second degree, having whole numbers for their roots: a problem like most of those of Fermat, of more curiosity than utility, but well calculated to exercise the powers of minds like those of Euler, Lagrange, Legendre, and Gauss. The question which is the particular subject of this paper was proposed as a challenge by Fermat, to his contemporaries in England, and correctly answered by Wallis, though without a very satisfactory demonstration. 11. Integration of an Equation, p. 98: a case in which the whole equation is integrable, though its parts, even when properly separated, are incapable of perfect integration. 12. On the Method of Variations, p. 163: in answer to Fontaine, and to Le Seur and Jacquier, who had attacked him in their *Integral Calculus*. 13. On the Motion of a Body attracted by two fixed Centres, p. 188-216, including the effects of different supposed laws of attraction. 14. On the Figure of Columns, p. 123. This memoir contains an attempt to demonstrate that the cone is a more advantageous figure for the strength of a column than any conoid, and the cylinder than any cone. But the calculations are founded on the erroneous supposition that the column must bend before it breaks; and, even upon this hypothesis, it appears possible to assign a stronger form than a cylinder, since the summit and the base of the cylinder must certainly contain some useless matter. 15. On the Mean of a number of Observations, p. 167: showing the advantage of taking the mean from the theory of probabilities. 16. On the Impulse of Fluids, *Misc. Taur.*, 1784-5, i., p. 75. The author observes, that this impulse will be measured by a column of twice the height due to the velocity when the whole impulse of the jet is received by an obstacle, but of the simple height when a limited surface is exposed to the force of a larger stream. 17. On the Integration of some Irrational Fluxions, ii., p. 218: involving the square root of an expression ascending to the fourth power of the variable quantity.

18. Some of the later of these papers are subsequent in date to those which are found in the *Memoirs of the Academy of Berlin*; but the order of enumeration is of little consequence. The first communication of Lagrange to the Academy, of which he was made director, is on Tautochronous Curves, *Mém. Berl.*, 1765, p. 364. The paper is dated 1767; and it contains a completion of Fontaine's investigation of the subject. 19. On the expected Transit of Venus, 1766, p. 265. The author has here analytically investigated the curves of immersion and emersion for the different parts of the earth. But, as Mr Delambre observes, in order to arrive at the very easy and tolerably accurate solution previously given by Delille and Lalande, he is obliged to employ in succession several elaborate expedients, founded on some very subtle principles, accompanied by various transformations of his ordinates, while by a trigonometrical calculation of a few lines we may obtain a more complete formula, comprehending even the terms which he has neglected, and which, although very small, are not absolutely insensible. At the same time, he has certainly applied his formula to the calculation of the parallax of the sun in a very convenient manner, which had accidentally escaped both Delille and Lalande, though it follows readily from the trigonometrical calculation. 20. On Indeterminate Problems of the Second Degree, 1767, p. 165. This is the first of a numerous series of papers relating to this difficult branch of analysis, which, notwithstanding its perfect inutility, has afforded sufficient scope for the exertion of talent, to give celebrity to the names of Diophantus and Fermat among the most ingenious of mathematicians. 21. On Numerical Equations, p. 311. This subject was also much cultivated by the author at a subsequent period: he here finds an equation for the differences of the roots, and exhibits the result in the form of a continued fraction. 22. Continuation of the Memoir on Numerical Equations, 1768, p. 111. The method of continued fractions is still further improved. 23. On the Resolution of Indeterminate Problems in whole Numbers, p. 181. 24. On the Resolution of Literal Equations by Series, p. 251. The contents of these memoirs have been principally merged in the author's later productions. 25. On the Force of Springs, 1769, p. 167. It is demonstrated in this interesting paper, that the force of a hair-spring approaches to the law of a circular pendulum, the more nearly as its length is greater. 26. On Kepler's Problem, p. 204: an application of the methods explained in the last volume, especially of a very elegant formula for the reversion of series. 27. On Elimination, p. 303: a refined and general method of exterminating a quantity from an equation, which, however, is somewhat intricate, even in the simplest cases. 28. Remarks on Isochronous Curves, 1770, p. 97: chiefly in answer to Fontaine, who had attacked him, and who had claimed the invention of the test of integrability of an expression containing

several variable quantities. Lagrange observes, that he might very possibly have rediscovered it, but that it was published by Nicolas Bernoulli in 1720: by Fontaine not till 1738. 29. On Arithmetical Theorems, p. 123; relating to the decomposition of a number into squares. 30. On the Resolution of Equations, p. 134. 31. On a Theorem respecting Prime Numbers, 1771, p. 125. A demonstration of the property of prime numbers discovered by Mr Wilson, and published by Waring; and of some other theorems of Waring. 32. On Equations, p. 138: in continuation. 33. On a New Mode of Differentiation and Integration, 1772, p. 185. The novelty consists in considering the characteristic of a fluxion as a quantity multiplying the letter to which it is prefixed, and inferring by induction that the result of the combinations obtained will in general remain unaltered by the supposition. The grounds of this method have been of late more fully explained by Arbogast and others. The results are here applied to interpolations, and to differences of various orders. 34. On the Form of Imaginary Roots, p. 222: in general reducible to $A + \sqrt{-1} B$. 35. On Astronomical Refractions, p. 259: without any practical applications. 36. On Equations of Partial Differences, p. 353; especially on finding multipliers to make them integrable. 37. On undisturbed Rotation, 1773, p. 85: a more direct method of investigation than that of Euler or D'Alembert, but without any new results. 38. On the Attraction of Elliptic Spheroids, p. 121. The author observes, that Maclaurin's prize essay is a masterpiece of geometry, comparable to the best works of Archimedes, though D'Alembert had once doubted of the accuracy of some of his propositions. Thomas Simpson's was the first analytical solution of the problem, but it was indirect, and depending on series only. In this paper the method of demonstration only is varied. Legendre and Laplace subsequently continued the inquiry. "But Mr Ivory," says Delambre, "has lately shown us that a very simple consideration may in some cases supersede a multitude of calculations, and even afford us theorems to which the most prolix computations could scarcely have conducted us." 39. On Triangular Pyramids, p. 149: an analytical determination of the content, and of the figures that may be inscribed in the pyramids, when their six sides are given. 40. Arithmetical Researches, p. 265: on the integral roots, in equations of the second degree. 41. On Particular Integrals, 1774, p. 197. Laplace had already pointed out the occasional occurrence of integrals not included in the general and direct expression obtained by the usual modes of integration. Such values are here deduced from the variation of the quantities originally considered as constant, which often affords us an equation of a different form, and leads to values not comprehended in the regular expression of the integral. 42. On the Motions of the Nodes of the Planetary Orbits, p. 276. Euler, Lalande, and Bailly had found some expressions for the temporary change of position of the nodes; the equations are here integrated, and the total changes determined. 43. On Recurring Series varying in two ways, or on Partial Finite Differences, 1775, p. 183: with an application to the theory of chances, upon Laplace's principles. 44. On Spheroids, p. 273: a demonstration of Maclaurin's theorem (Fluxions, art. 653) concerning the attraction of a compressed spheroid or an amygdaloid; derived from the formulæ contained in the former papers. 45. Arithmetical Researches continued, p. 323: demonstrating some theorems of Fermat with which Euler had not succeeded; yet leaving others still unattempted. 46. On the Mean Motions of the Planets, 1776, p. 199: showing that all their changes are periodical. Laplace had detected an error in the author's reasoning when he attributed secular equations to the motions of Jupiter and Saturn, the expressions containing the terms in question being compensated by others which he had neglected. 47. Cases of Spherical Trigonometry solved by Series, p. 214: without any apparent advantage. 48. On Integration by continued Fractions, p. 236: gives an example of the binomial theorem converted into a continued fraction, which, however, exhibits no particular elegance nor simplicity. 49. On the Number of Imaginary Roots of Equations, 1777, p. 111. Harriot was the father of the doctrine of equations. Newton made great improvements in it, but his rule remains imperfect with regard to the higher equations, even with the additions of Maclaurin and Campbell. In the present paper the theorem of Waring is demonstrated, without any material attempt to extend it. 50. On the Diophantine Analysis, p. 140. It is remarked that Fermat left all his propositions undemonstrated, except this theorem, that the sum of two biquadrate numbers can never be a square. 51. On Escapements, p. 173: an investigation of the best forms of pallets for the dead beat and the recoiling escapements. 52. On determining the Orbits of Comets by three observations, 1778, p. 111-124. The first part of this memoir is historical and critical, and the author allows due credit to the ingenuity of Newton's method: his own does not appear to have been of any practical utility. 53. On the Theory of Telescopes, p. 163: comparing the general theorems of Cotes and Euler, and applying

Lagrange. the method of recurring series to their demonstration; with a rule for determining the magnitude of the field. 54. On the Expression of the Time in a Conic Section, p. 181: after Lambert, who determines it from the chord of the arc described, the sum of the revolving radii, and the great axis: the theorem is here analytically demonstrated. 55. On Particular Integrals, 1779, p. 121: examples from some mechanical curves. 56. On Geographical Projections for Maps, p. 161-186. The methods here proposed for the construction of maps have been found too intricate for adoption. 57. On the Theory of the Libration of the Moon, 1780, p. 203. In the prize essay on the moon's libration, the author had made the first application of the method of variations: the investigation is here continued; and it is observed that the moon cannot be of homogeneous matter, nor its form such as would afford equilibrium to a fluid covering it, since the effects of the ellipticity, so determined, would be much less perceptible than they are. 58. Report on a Quadrature of the Circle, *Hist. Ac. Berl.* 1781, p. 17. This paper only requires to be noticed as a specimen of the author's condescension. 59. Theory of the Motion of Fluids, *Mém.*, p. 161: an application of D'Alembert's principles to the phenomena of running fluids, and to the motion of waves; but founded on an arbitrary assumption with respect to the depth affected by the waves. 60. On the Secular Variations of the Elements of the Planets, p. 199. The theory of perturbations is here examined by two methods, either comprehending the general form of the orbit, or regarding the local effects only. 61. Report on a Mode of finding the Form of the Earth, *Hist.* 1732, p. 35: a proposal of no value whatever. 62. On the Secular Variations of the Planets, *Mém.*, p. 169: a continuation of the former memoir, with all the details of the application, and a determination of the change of the place of the ecliptic, together with a determination of the permanency of the general arrangement of the system, depending on the exemption of the mean distances from all variations not periodical, while the other elements are liable to greater alterations. 63. On the Periodical Variations of the Planetary Motions, 1783, p. 161: a sequel to the memoirs on the secular variations. 64. Additions respecting the Secular Variations, p. 191: completing the examination, and extending it to the case of Jupiter and Saturn, which had before been investigated by Laplace. 65. On the Correction of the Errors of Astronomical Approximations, p. 224. The errors here considered arise from the employment of the powers of the arcs described in the equations concerned, these arcs increasing without limit; they may be avoided by means of approximations founded on the supposition of the variation of the elements. Laplace had before employed a method still more refined. 66. On a Particular Mode of Approximation, 279: resembling that which Briggs employed for making logarithms. 67. On a New Property of the Centre of Gravity, p. 290: relating to the mutual distances of the bodies. 68. A direct and general Determination of the Motion of a Comet, p. 296. In this third memoir the problem is reduced to equations of the eighth or seventh degree. 69. Theory of the Periodical Variations of the Planetary Motions, 1784, p. 187: continuation of the memoir of the preceding year, containing the independent variations of the eccentricities and inclinations for the six principal planets; with a numerical application of the formulæ demonstrated in the first part. 70. On the Integration of Equations of Linear Partial Differences, 1785, p. 174: entering into further details of the method laid down in a former paper, which is here applied to the problem of trajectories, a problem once proposed by Leibnitz as a trial of strength to Newton, who was not fully aware of the nature of the difficulty intended to be combated: it was, however, solved in England by Taylor, though indirectly. Nicolas Bernoulli and Hermann gave a more complete solution, and Euler added still more to the generality of the investigation. The author observes that the problem is a mere curiosity; there is, however, one case in which a trajectory of the kind here considered is actually applicable to a natural phenomenon of common occurrence, which is that of a wave diverging from a point in a gradually shelving shore; for the figure or direction of the collateral parts of such a wave may be shown to be the orthogonal trajectory cutting an infinite number of cycloids beginning at the given point. 71. On the Motion of the Aphelia of the Planets, 1786, i.; a geometrical investigation, in the manner of Newton, intended as an appendix to the *Principia*. 72. On the Theory of Sound and Waves. This paper is also intended to complete the demonstrations contained in the same work. The volume in which both these interesting memoirs appear seems to have been published out of the regular order, from some circumstances connected with the death of Frederick; and it is wanting in many of the British libraries. 73. Note accompanying a Memoir of Duval le Roi, 1786-7, p. 253. On the Secular Equations of the Georgian Planet. 74. On a Question relating to Annuities, 1792-3, p. 235: the case of an annuity supposed to commence after a death, and to cease at a given age. 75. Additions to former Memoirs, p. 247: on recurring series (n. 43;

on elliptic spheroids (n. 38): on interpolations, in Mouton's manner, Lagrange. comprehending the inequality of the distances of the observations; on the secular equation of the moon (n. 64.) After Laplace's great discovery of the cause of the secular acceleration, Lagrange found that it might have been easily deduced from his own calculations, almost in the same form, if he had not accidentally neglected the application, from having assured himself, in 1783, that the results of a similar computation were nearly insensible in the case of Jupiter and Saturn. It was in 1787 that the discovery of Laplace was announced. The acceleration here computed is 10^{-5} for the first century after 1800. Mayer found it $9''$, from a comparison of observations. 76. On a general Law of Optics, 1803, *Math.* p. 3. a demonstration of the foundation of the method long used by English opticians for determining the magnifying powers of telescopes of all kinds, which form an image of the object-glass beyond the eye-glass, by measuring the diameter of that image. The author hazards, in this paper, the very singular assertion, that the illumination of the object must be the same in all telescopes whatever, notwithstanding the common opinion, that it depends on the magnitude of the object-glass; and his reasoning would be correct if the pupil of the eye were always less than the image of the object-glass in question; since, as he observes, the density of the light in this image is always inversely as the magnifying power; but he forgets to consider that the illumination on the retina, when the whole pencil is taken in, is in the joint ratio of the density and the extent; a consideration which justifies the common opinion on this subject, and shows that a most profound mathematician may be grievously mistaken in his conclusions, if he proceeds to calculate upon erroneous grounds. It deserves, however, to be remembered, that the brightness of any given angular portion of a magnified image must always be somewhat less than that of an equal portion of the object seen by the naked eye; because it can be no greater if the pencil fills the pupil, and will be less in proportion as the pencil is smaller than the pupil, besides the unavoidable loss of light at the refracting surfaces.

77. The later works of Lagrange have principally been published at Paris, and most of them in the various collections of the academy. The earliest of these are the prize memoirs; and, first, the Essay on the Libration of the Moon, which obtained the prize in 1764, *Ac. Par. Prix.* ix., 1772. It is in this memoir that the method of variations was first practically applied to a mechanical problem. 78. On the Inequalities of the Satellites of Jupiter, in 1776; including the consideration of their mutual perturbations, and consequently a case of the problem of six bodies. The author never resumed the subject, but its investigation was completed by Laplace. 79. A New Method of solving the Problem of Three Bodies, in 1772. 80. On the Secular Equation of the Moon, in 1774, *M. Sav. Etr.* vii. for 1773: an unsuccessful attempt, with conjectures respecting the existence of a resisting medium, and even doubts of the accuracy of the foundation of Halley's discovery. 81. A prize memoir, On the Perturbation of Comets passing near Planets, *M. Sav. Etr.* x., Par. 1785, p. 65: finding the path directly, without regard to the conic sections, and employing three different modes of computation for the different parts of the orbit. 82. On forming Tables by observations only, *Mém. Ac. Par.* 1772, i., p. 513. The method of recurring series is principally employed, and the author observes, that the problem is more useful than difficult, giving an experimental example in the equation of time, for which he obtains, from the results of the table, an expression very near the truth. Delambre remarks that this is only a continuance of the system adopted by Ptolemy and the other ancient astronomers, showing what we might have done in a circuitous manner by pure mathematics if Newton and the laws of gravity had not existed; and he thinks the paper only valuable as a specimen of Lagrange's talent for overcoming difficulties which he might more easily have avoided. 83. On the Nodes and Inclinations of the Planetary Orbits, 1774, p. 97: with details of the calculations for all the planets. 84. On the Variation of the Elements of the Planets, *Mém. Math. Inst.* 1808, p. 1. The object of this paper is to show, as Poisson had done before, that all the changes of the system are periodical. The method is more general, but less simple, than that of Laplace, who first discovered the principle by induction. The lunar acceleration is given as an example. M. Poisson has extended his calculations to quantities of the second order, which do not enter into Lagrange's investigations. 85. On the Variation of Independent Quantities in general in Mechanical Problems, p. 257. The author observes, that many of the modern improvements of mathematics depend on doing away the distinction between constant and variable quantities, which was so valuable when it was first enforced by Descartes. 86. A second Memoir on the Variation of Independent Quantities, 1809, p. 343: simplifying the general application of the doctrine.

87. Lectures on Arithmetic and Algebra, *Séances des Ecoles*

Lagrange. *Normales*, Year III., 1794-95. The first lecture relates to the elements of arithmetic, the second to the lower orders of equations, and the third to the higher. All these lectures, under the name of "conversations," were taken down in short-hand by some of the students, and afterwards corrected by the professors.

88. An Essay on Political Arithmetic, Roederer, *Collection de divers Ouvrages*, Paris, Year IV., 1795-96.

89. In the *Journal de l'Ecole Polytechnique*, we find an Essay on Numerical Analysis, and on the Transformation of Fractions, vol. ii., 1798, p. 95. It contains the elementary theory of continued fractions, and the mode of reducing them. 90. On the Principle of Virtual Velocities, p. 115; chiefly relating to pulleys. 91. On the Object of the Theory of Analytical Functions, vi., 1800, p. 232: a detailed explanation of the grounds of the theory laid down in the separate publication on this subject. 92. Analysis of Spherical Triangles, p. 270: giving all their essential properties in a concise form. 93. Lectures on the Calculus of Functions, xii., 1804: published also separately in 8vo; a commentary on the theory of functions, and a supplement to it, contained in twenty lectures. 94. Two more Lectures, xiv., 1808: at the end, chiefly relating to the method of variations. 95. On a Difficulty respecting the Attraction of Spheroids, viii., xv.; remarks which may serve as a commentary on a passage of the *Mécanique Céleste*.

96. On the Origin of Comets, *Connaissance des Temps*, 1814. 97. On the Calculation of Eclipses, as affected by Parallax, 1817: from the *Berlin Almanac* for 1782. This memoir, as Delambre observes, is singularly attractive to a person previously unacquainted with the methods which are employed; but though the formulæ first introduced are direct and rigorously accurate, the whole investigation ends in an approximation which wants both these properties.

98. The most important of all the works of Lagrange are those which have appeared in separate volumes; and among these we may reckon his *Additions à l'Algèbre d'Euler*, 8vo, Lyons, 1774, vol. ii.; German, 1796; English, 1797. They relate chiefly to continued fractions and to indeterminate problems, and constitute the most valuable part of the whole work, which, in its abridged form at least, is far inferior to Maclaurin's Algebra. 99. *Mécanique Analytique*, 4to, Par. 1788, 2d edit., vol. i., 1811; vol. ii. by Prony, Lacroix, and Binet, 1815. This work exhibits a uniform and elegant system of mechanical problems, deduced from the simple principle of virtual velocities, which was well known to former authors, but never so extensively applied. It has been remarked, that many parts of it may be read with advantage, even by those who are not competent to enter into any of the computations, exhibiting such a history of the progress of the science as could only have been sketched by a master. The new edition, begun at the age of seventy-five, comprehends all the improvements contained in the author's later memoirs on various subjects. 100. *Théorie des Fonctions Analytiques*, 4to, Par. 1797, 1813. The abstract theory of analytical functions has been very fashionable among modern mathematicians; but the improvements which it contains are chiefly of a metaphysical nature, if they can with propriety be called improvements. The notation is less simple than that which is in common use, and has been abandoned by the author in some republications of the works in which he had at first employed it. The calculations, too, are often more intricate than others which afford the same conclusions. 101. *Résolution des Equations Numériques*, 4to, Par. 1798, 1808. The refined and abstruse speculations contained in this volume are more calculated to promote the advancement of the abstract science of quantity, than to be applied, as the title would seem to denote, to the purposes of numerical computation. The methods investigated are in general laborious and complicated, though instructive, and capable of extensive application; and for equations of which all the roots are real, the author himself recommends M. Budan's method, as preferable to his own. The second edition contains a number of very interesting notes, which are full of ingenuity and novelty.

The author of so immense a series of laborious investigations must certainly have been a most extraordinary man. He had acquired the character of an illustrious mathematician almost in his boyish years; and he continued to apply the force of his powerful mind, for more than half a century, to the almost uninterrupted pursuit of his favourite sciences. It seems, however, that his earliest were also his greatest successes; and all that followed was as little as could well be expected from a continued employment of the means which he possessed at the beginning; for, in fact, the whole taken together appears to bear a stronger character of great industry than of great sagacity or talent.

"It was formerly usual," says Delambre, "for mathematicians to inquire, in every investigation, for some general considerations, which might be capable of simplifying it, or of reducing it to a problem already resolved, and to endeavour by these means either

to abridge the calculation, or sometimes to supersede it altogether. But since the discovery of the infinitesimal calculus, the facility and universality of this method, which often renders the possession of any talent in the calculator wholly unnecessary, has made it more usual for mathematicians to direct their chief attention to the perfection of this all-powerful instrument. But at the present day, when researches of this kind appear to be completely exhausted by the labours of Euler, Lagrange, and other industrious contemporaries, it might perhaps be more advisable to return to the ancient method, and to follow the example of [Newton, surely, and of] Daniel Bernoulli, who, as Condorcet observes, was entitled to the praise of moderation in the introduction of his calculations. Lagrange was in the habit of employing his sublime talents in a different manner. He liked to make everything dependent on his analysis, though, in some instances, he united both methods in the highest degree, as his invention of the calculus of variations bears witness. His reducing the theory of sound to that of the vibration of chords, is a specimen of a very ingenious simplification; as well as his mode of computing the planetary motion by the variation of the elements of their orbits, which is also applicable to all other cases of the operation of small disturbing forces. But it must be confessed, on the other hand, that he has sometimes created difficulties where none existed, by applying his profound and ingenious methods to the solution of elementary problems, which may be obtained from a construction of the simplest kind; and the powerful agents which he employs, on many trifling occasions, remind us only of the man in the fable, who came to borrow the club of Hercules, and the thunder of Jupiter, for the purpose of destroying a flea;" or of the modern mathematician who, without any fable, or any figure of rhetoric, proposed to adjust a standard measure by placing it at a distance and viewing it with a good telescope. The habit of relying too confidently on calculation, and too little on common sense, will perhaps account for the mistakes of Lagrange which have been already noticed, respecting the forms of columns, and the illumination of optical instruments; nor are they the only instances of the kind which may be produced from the modern history of the sciences. It seems, indeed, as if mathematical learning were the *euthanasia* of physical talent; and, unless Great Britain can succeed in stemming the torrent, and in checking the useless accumulation of weighty materials, the fabric of science will sink in a few ages under its own insupportable bulk. A splendid example has already been displayed by the author of the article ATTRACTION; and, to do justice to our neighbours, it must be allowed that they have received the boon with due gratitude, and acknowledged it by merited applause:—"All the analytical difficulties of the problem," say Legendre and Delambre (*Mém. Inst.* 1812), "vanish at once before this method; and a theory, which before required the most abstruse analysis, may now be explained, in its whole extent, by considerations perfectly elementary." It is indeed only when a subject is so simplified that the investigation can be considered as complete, since we are never so sure that we understand the process of nature as when we can trace at once in our minds all the steps by which that process is conducted. It is not without some reason that a similar disposition to revel in the luxury of mathematical sports has been sometimes objected to in Laplace, a man of equal analytical acquirements with Lagrange, but possessed, apparently, of greater sagacity, and certainly more successful in his application of mathematics to physical researches, although he also seems, on some occasions, to have suffered his habits of abstract reasoning to lead away his attention from the true conditions of the problem, particularly in his first supplement respecting capillary attraction, which concludes with an equation so erroneous that he has been obliged to abandon it in silence. (See the article COHESION.) Another instance of ill-applied computation has been noticed in the article CHROMATICS; when Laplace attempted to deduce the laws of extraordinary refraction from the principle of the minimum of action, he seems to have forgotten that the demonstration of that principle, in his own great work, rests expressly on a condition which is here wanting, that "the forces concerned must be functions of the distances," and of course independent of the directions. These imperfections, however, do not deserve to be noticed as materially affecting the general merits either of Lagrange or of Laplace, but they may be considered as accidents which ought to warn us against relying too implicitly on authority, however high, when it appears to militate against clear, simple reasoning, and sound common sense.

(Delambre, *Mém. Inst.* 1812, ii.; *Journal de l'Empire*, 28th April 1813; Virez et Potel, *Précis Historique*, Paris, 1813, in 4to; Cosali *Elogio*, Padua, in 8vo, 1813; Maurice in *Biographie Universelle*, xliii. Paris, in 8vo, 1819.) (T. Y.)

LAGUNA, the capital of Teneriffe. See CANARY ISLANDS.

LAHORE, in Hindustan, a city, the capital of the Pun-

Laguna
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Lahore.

Laigle
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Laing.

jab, situate about a mile from the eastern bank of the River Ravee. It is surrounded by a brick wall, formerly 25 feet high, but which has been lowered by order of the British government since the annexation of the Punjab to their dominions. The streets of Lahore are narrow, but contain many lofty houses, inclosed within extensive dead walls. It is still a place of considerable size, with a good bazaar; but it is not inhabited by wealthy people. On account of the frequent sackings it has sustained, they have migrated for safety to Amritsir. The palace was originally founded by Achar, and enlarged by his successors. Across the Ravee, at Shah Durra, about 2 miles N. of Lahore, stands the celebrated mausoleum of Jehangeer, within a wall of nearly 600 yards square. It is a magnificent building, 66 paces on each side, and still in very good condition. To the southward of this, in the open plain, is to be seen the tomb of Noor Jehan Begum, a building 36 paces square. In 1812 Runjeet Singh was building a very thick wall and rampart round the city, with a deep, broad ditch. The palace has also been surrounded by a deep and broad ditch, the whole faced with brick, and the earth thrown inwards, so as to form a broad rampart, with bastions at intervals. Judging from the ruins in the neighbourhood of the city, Lahore must have greatly fallen from its ancient grandeur, yet the domes and minarets of the mosques, the lofty walls of the fort, the splendid mausoleum of Jehangeer, and the numberless inferior tombs and temples that surround the town, still render it an object of curiosity and admiration. Lahore was taken by Sultan Baber, A.D. 1520, and was for some time the seat of the Mogul government. Since that period it has undergone many revolutions, and was for a considerable time possessed by the Abdalli Afghans of Cabul, by whom it is named Sikrei. In 1799 Runjeet Singh was by Zeeman Shah invested with the government of Lahore, and shortly afterwards this adventurer extended his power over the whole of the Punjab. When, after the death of Runjeet Singh, the enormities committed by those who grasped his power compelled the English to put an end to his dynasty, Lahore, with the rest of the country, became British. The events connected with its subjugation are related in the historical sketch of the Punjab. The city of Lahore is in Lat. 31. 36., Long. 74. 21.

LAIGLE, or L'AIGLE (the ancient *Aquila*), a town in France, department Orne, is situated on the sloping sides of two hills, on the River Rille, 80 miles W.S.W. from Paris. Its chief manufactures are cutlery, hardware, leather, paper, cotton, and linen. It has a large trade in corn, wood, and cider, together with needles and pins. The town is well built, but contains few buildings worthy of note, except the large church of St Martin's, and an old chateau built of brick, and surrounded by tall and beautiful lime trees. In the vicinity is the mineral well of St Santin. Pop. 5678.

LAING, MALCOLM, a sagacious historian, or rather historical critic, was born in 1763, at his paternal estate in Orkney, and educated at the grammar school of Kirkwall. Removing to Edinburgh, he studied law at the university, and took a leading part in the debates of the Speculative Society, a literary club with which the early lives of Scott, Jeffrey, Brougham, Mackintosh, and many other eminent men, were long associated. In 1784 he passed advocate, but failed to work himself into practice. He only distinguished himself at the bar on one occasion, when he undertook the defence of Joseph Gerrald on his trial for sedition in 1794. He first made himself a name in letters by finishing and carrying through the press the last volume of Henry's *History of Great Britain*, left incomplete by the author's death. Henry had been a staunch conservative. Laing was an equally staunch liberal. Each wrote from the stand-point of his own party, and the principles and views of politics in the last volume of the history are at signal variance with those of the other parts of the work.

Dr Parr used to speak in terms of the highest praise in regard to that part of the narrative which treats of the conduct and treatment of Perkin Warbeck.

In 1800 he published his *History of Scotland from the Union of the Crowns, on the Accession of James VI. to the Throne of England, to the Union of the Kingdoms in the reign of Queen Anne*. Two preliminary dissertations accompanied this work, one on the Gowry Conspiracy, and another directed against the authenticity of the poems of Ossian. In 1804 a second edition of the "History" was called for; and the author seized the occasion to add a third essay, *On the Participation of Mary Queen of Scots in the Murder of Darnley*. Laing's only other contribution to history was his edition of the *Historie and Life of King James the Sixth*, published in 1804 from a copy of the original manuscript, from which Crawford of Drumsay, historiographer to Queen Anne, had compiled his *Memoirs of the Affairs of Scotland*. These "Memoirs" had been written in the interest of Mary Queen of Scots, and professed to be based on a MS. history of the times. Laing discovered the original manuscript, and proved, with his usual acuteness, that Crawford had so garbled and mutilated it as to have committed "one of the grossest literary forgeries that had ever been employed to pervert the genuine history of Scotland." In 1805 Laing married Margaret Carnegie of Craigo, in Forfarshire. Two years later he entered parliament as member for Orkney, but bad health drove him back into private life after a single session. Retiring to his native place, he recovered a little, and spent the remainder of his life in agricultural pursuits. His death took place somewhat suddenly in November 1818. To Mr Laing, as a historian, belongs the undoubted merit of having cleared away much rubbish, removed many prejudices, refuted numerous and grave errors, detected not a few impostures, and generally placed both the character and events of that portion of our national history of which he treats in a clearer and more satisfactory light than he found them. Although he had many enemies, few dared to reproach him with a disregard of truth. His sagacity and acuteness led him instinctively to results, the most of which have been confirmed by more recent investigation.

LAIRESSE, GERARD, a celebrated Flemish painter, was born at Liege in 1640. He learned his art from his father, himself a painter of some note, and at the age of fifteen received commissions both for portraits and historical pieces from the Electors of Cologne and Brandenburg. He painted with great rapidity, and earned large sums of money, but extravagance and dissipation ran away with his gains, and he retired to Utrecht. While living there in great poverty, two of his pictures fell into the hands of Gerard Vlyenburg, a famous dealer of Amsterdam. By his advice Lairesse removed to that city, and his paintings always found there a ready and lucrative sale. At the age of fifty he had the misfortune to lose his eye-sight, and he then began to lecture on the principles of drawing and painting to the artists and students who crowded to hear him. After his death, which took place in 1711, in his seventy-second year, the notes of these lectures were re-edited by the Society of Painters at Amsterdam into that famous treatise on the art of painting which passes under his name. Lairesse's drawing is marked by grace and ease. His colouring, deficient perhaps in vigour, is correct, natural, and well-blended. He excelled in subjects drawn from the ancient mythology, especially bacchanalian scenes. These enabled him to display his knowledge of classic costume and architecture, in which he was deeply learned.

LAKE OF THE THOUSAND ISLES, in British North America, is a creek on the N.E. side of Lake Ontario, and forms the commencement of the River St Lawrence. Extending in a N.E. direction from Kingston, it is

Lairesse
||
Lake of the
Thousand
Isles

Lake of the 40 miles in length; its greatest breadth is 15 miles. The islands with which it is studded amount to about 1700. Wolfe Island, the largest, is 10 miles in length, by 6 miles in breadth.

LAKE OF THE WOODS, in British North America, forming, along with the Winnipeg River, a junction between Lake Winnipeg and Lake Superior. N. Lat. 49., W. Long. 95. Its length is about 60 miles, and its circumference 300 miles. It is studded with beautiful wooded islands, and its shores are very deeply indented. Its principal feeder is the Rainy River, issuing from Rainy Lake, and its principal outlet is the Winnipeg River, falling into Winnipeg Lake.

LALANDE, JOSEPH JEROME LEFRANÇOIS DE, a most zealous and accomplished astronomer, born at Bourg en Bresse, on the 11th of July 1732, was the son of Peter Lefrançois, and Marianne Mouchinet, his wife.

His parents were in easy circumstances, and his education being somewhat too indulgent, the natural quickness and impetuosity of his temper was too little restrained. His earliest taste, like that of most other children, seems to have been for romantic tales; and he was fond of making little stories with such materials as he possessed, but their subject was chiefly religious. He was in the habit of living much with the Jesuits, and he imbibed from them a predilection for the pulpit. At the age of ten he used to amuse himself with making sermons, and preaching them to a select congregation. The comet of 1744, however, with its long tail, took more forcible possession of his imagination, and he watched it with the most unremitting attention. Having been sent to Lyons to continue his studies under the Jesuits there, he acquired a taste for poetry and eloquence, and was then inclined to devote himself to literature and to the bar, but an eclipse of the sun recalled his attention to astronomy. His parents wished him to follow the profession of the law, and with that view sent him to Paris, but he accidentally lodged in a hotel where Delisle had established an observatory, and this circumstance led him to become acquainted with that professor, and to attend his lectures. These lectures were by no means popular; and the want of a more numerous audience made it easy for the professor to accommodate his instructions to the fixed attention and rapid progress of his new pupil, who became singularly attached to his master, and to all the methods which he employed. Lalande attended, however, at the same time, the physico-mathematical lectures of Lemonnier, who was more in credit as a teacher, and who also took great pains for his improvement.

In the mean time he had completed his legal studies, and at the age of eighteen he was called to the bar as an advocate. His family was anxious for his return to Bourg, but just at that time Lemonnier obtained leave to nominate him as a substitute for himself on an astronomical mission to Berlin, where he was to make observations on the lunar parallax, corresponding with those which Lacaille was sent to the Cape to obtain. He was favourably received by Maupertuis, who introduced him to Frederick and his court; and was made a member of the Academy of Sciences at Berlin when he was about nineteen.

He remained a year in that city, observing at night, and passing his mornings in the study of the integral calculus, under Euler's directions, and his evenings in the society of Voltaire, Maupertuis, D'Argens, and other men of talents. It was not likely that his intercourse with such persons would confirm the principles which he had imbibed from the Jesuits; his moral conduct, however, does not appear to have been influenced by his change of sentiments. After his return to Bourg, he pleaded a few causes to oblige his friends, but the success of his operations at Berlin obtained him speedily a place in the Academy of Sciences at Paris; for, in 1758, before he was twenty-one, he was chosen to

fill up a vacancy in the department of astronomy, which had been open for some years. He soon afterwards offended his friend Lemonnier, by rejecting too harshly an unfounded objection of that astronomer to his method of computing the effect of the earth's ellipticity on the lunar parallax, which differed from Euler's formula. Lacaille, who drew up the report of a committee appointed on the occasion, decided in Lalande's favour; but Lemonnier remained dissatisfied, and would not see him for twenty years. He had some similar discussions, at a later period, with Duséjour, who was a little too severe in criticizing some of his approximations, as if they had been intended to be rigidly accurate, but their personal friendship remained unaltered.

For more than fifty years he continued to be a constant and voluminous contributor to the *Memoirs of the Parisian Academy*, as well as to other scientific collections. His investigations were always judiciously directed to the advancement of astronomy, but they can scarcely ever be said to have exhibited any marked features of talent, or of address, beyond what might be expected from the industry of a man of good ordinary abilities, confining himself almost entirely to one subject. He was always anxious to call the public attention to astronomy as a science and to himself as an individual. Thus, on occasion of the transits of Venus in 1761 and 1769, he addressed a circular letter to most of the governments of Europe, on the importance of obtaining a multiplicity of collateral observations, and he received in reply several invitations from sovereigns whose countries were more favourably situated for the purpose than France, to come and make the observations in person. He thought it unnecessary, however, to leave Paris on the occasion. He contented himself with being the first to announce to the public the result of the most satisfactory comparisons, and his countrymen seemed to give him almost the whole credit of everything that had been done by others in conformity with his suggestions. He was much mortified, however, in not receiving from Father Hell an account of the observations made at Wardhuus; and he was afterwards greatly inclined to dispute their accuracy, because Hell made the parallax smaller than he did by $\frac{1}{4}$ th of a second, whilst the mean of both results, which is $8''6$, agrees extremely well with the most modern computations; but, in the end, he did justice to the importance of Hell's observations.

He was constantly in the habit of passing a few months every year with his family in the country, and he occasionally amused himself, in the course of these visits, with mineralogical excursions, and with chemical studies. He delivered, about the year 1758, an oration before a public assembly at Lyons, on the advantage of monarchy above every other form of government; he even adhered to a similar opinion, and expressed it openly, in times when nothing but his celebrity as a man devoted exclusively to science, could have made it safe for him to declare it.

After having published the astronomical tables of Halley, he felt the necessity of a new collection, and determined to begin with those of Mercury, which he found the most imperfect. He pursued, for this purpose, a regular course of observations at the Palais Royal, where he used to go before sunrise in the winter mornings to see the planet in the twilight. Having occasion to refer to the observations recorded by Ptolemy, he found it necessary to refresh his acquaintance with the Greek language, which he had in some measure neglected. But, with all his labour and diligence, his tables of Mercury exhibited, in 1786, an error of forty minutes in the time of a transit. The circumstance mortified him extremely, but it led to a revision of the tables, and he afterwards succeeded in making them much more perfect. It must be recollected that, in the time of Hevelius, a transit was anxiously expected for four whole days before it occurred.

He next undertook to improve the tables of Mars and

Lalande.

Lalande. Venus. His tables of these planets were, on the whole, less accurate than those of Mercury, though more exempt from great occasional errors. He had computed their perturbations in the *Memoirs of the Academy*, but he never thought it worth while to compare his formulas with observation. The irregularities of Jupiter and Saturn were much more discouraging; he was obliged to confine himself, in discussing them, to the most modern observations, and he did not appear sufficiently to appreciate the empirical equations of Lambert, though they greatly diminished the errors of Halley's tables.

When Maraldi had given up the management of the *Connaissance des Temps*, Lalande and Pingré were candidates for the appointment. Lalande succeeded in obtaining it, but he had the modesty to confess that the work would have been more accurately performed by Pingré, if his connection with the church had not, according to the rules of the Academy, incapacitated him for the situation. He made the work, however, much more popular, as a miscellaneous publication, than Pingré was likely to have done; and he was less prejudiced than Pingré in the choice of his tables. He remained editor of the work from 1760 to 1775; it was conducted by Jeaurat from 1776 to 1787, and from 1788 to 1793 by Méchain. Lalande then undertook it once more, Méchain being engaged in some measurements with Delambre, and the Academy having been abolished, and its members dispersed.

Lalande had been disposed to call in question the assertion of Newton and Voltaire, that no comet could possibly come in contact with the earth, and he had proved that the effect of perturbations at least rendered their reasonings somewhat inconclusive. A short memoir on the subject, which was to have been read at a public sitting of the Academy, was accidentally omitted, as not very important, from the pressure of other business. This circumstance alarmed the sensibility of the public of Paris, who fancied that Lalande had foretold some dreadful catastrophe which the government was afraid to announce; and when the memoir was published, they insisted that its contents had been modified, to lessen the alarm. Duséjour made some objections to the author's reasoning, but the whole affair was soon forgotten.

A memoir on the length of the year was honoured with a prize by the academy at Copenhagen. Delambre, however, thinks the determination not so good as the earlier one of Lacaille, though much better than Mayer's, which was more commonly adopted. Lalande took great pains also with the subject of the sun's rotation, employing in his computations of the places of the spots an easy approximation, instead of Duséjour's more laborious methods; but being careful to compare with each other the most distant observations of the same spot. From the existence of this rotation he thought it reasonable to infer that the sun had also most probably a progressive motion, which would naturally be produced by any single impulse capable of occasioning a rotation. He had some discussions with Dr Maskelyne respecting the mode of computing the equation of time, in which Maskelyne appears to have had the advantage.

In the year 1762, Delisle resigned in his favour the professorship of astronomy in the College de France, which he kept for nearly forty-six years. He allowed the most attentive of his pupils to board with him at a cheap rate, doing his utmost on all occasions to promote their success in their studies and in life. Thus he brought forward Méchain and Dagelet, and afterwards his own nephew, who completed, with so much diligence and accuracy, the *Description of the Heavens*, which he had himself projected, and which had been begun by Dagelet before his unfortunate expedition. He was made a fellow of the Royal Society of London in 1763.

His health was generally good, though his constitution was delicate. He had an attack of jaundice in 1767, which was attributed to intense application, but he completely recovered from its effects by an attention to diet, and by the use of horse exercise. He then intended to leave all his property to the Academy, but he afterwards gave up his family estates to his relations, and lived on his appointments only, refraining from all kinds of luxuries, in order to be the more able to do acts of liberality to his friends, whom he always sought to oblige in the most delicate manner, and often without making his services known. He had a pension from Russia in the time of the Empress Catherine; it was suspended by Paul, but restored in 1805 by Alexander.

He was not particularly successful as an observer, but used to refer to the works of his contemporaries, Bradley and Lacaille, though not exactly, according to the expression of one of his biographers, "as Ptolemy had done to those of Hipparchus;" for Hipparchus must have been dead two centuries before Ptolemy was born. On the occasion of the disappearance of the ring of Saturn in 1774, he went to Béziers, in order to profit by the superior serenity of the air there, the climate of that country being supposed to be the best in France; but his observations were less valuable than others made at Paris and in London.

In the year 1798 he undertook an astronomical expedition to Gotha. He had once meditated an aerostatical voyage there; but his companion took care that their dangers should terminate in the Bois de Boulogne. He was received with much interest at Gotha by an assembly of astronomers that was collected from different parts of Germany. The object of the congress was perhaps not unmixed with personal vanity; but it had no political design to promote, unless the general adoption of the new French measures could be considered as a political object. Lalande was by no means a revolutionist; he was sufficiently free from any prejudices of education; but he openly condemned the political opinions of the day; and, in 1792, he even exposed himself to great personal danger in order to save the life of Dupont de Nemours, after the 10th of August; and he was equally useful to some of the clergy, whom he concealed in the buildings of the Observatory at Mazarin College, making them pass for astronomers. He had also the courage to publish accounts of Lavoisier and Bailly a short time after their deaths.

The attentions of the German astronomers gave him sincere pleasure. He was at all times extremely sensible to compliments, and even to flattery, though very regardless of satire. He used to call himself a sponge for praise and an oil-cloth for censure. He professedly believed himself endowed with all the virtues, modesty not excepted. He was so fond of notoriety, that he once undertook to exhibit the variations of the light of Algol to the public of Paris on the Pont Neuf; but the police interfered, thinking it right to prevent a disorderly assemblage.

Though Lalande can only be classed in the second rank as an inventive astronomer, or a mathematician, he certainly stands in the first as a professor and a popular writer. His methods of calculation have in most instances been already superseded by others more convenient or more exact; those which related to particular phenomena for want of sufficient precision, and those which were more general for want of being readily applicable, without continual repetition, to a sufficient number of concurring observations. It has been observed, that he may perhaps have been often too zealous in the pursuit of his favourite objects; but that, if he had possessed more circumspection, and less vivacity of character, he would have been more exempt from criticism, yet would have rendered less important services to science and to mankind.

His last illness was of a consumptive nature, and he

Lalande. seems to have accelerated its termination by attempting too much to harden himself. He died on the 4th of April 1807, nearly seventy-five years old, and in the perfect possession of his faculties. His last words, when he dismissed his attendants to rest, were, "I have need of nothing more;" and in a few minutes he was dead. Had he survived a few hours, he would have received a letter from Dr Olbers, announcing the discovery of a new planet, for which that distinguished astronomer afterwards received the fourth prize medal from the institution founded by Lalande in 1802, for the most important astronomical discovery made in the course of the year.

Of his voluminous and diversified publications, a simple enumeration of the subjects will perhaps be thought sufficient. The more important only of them will be criticised:—

1. We find, in the *Memoirs of the Parisian Academy of Sciences* for 1751, an account of his Observations at Berlin, which also appears in the *Memoirs of Berlin* for 1749, and a Latin translation in the *Acta Eruditorum* for August 1752. 2, 3. 1752–53, An Essay on the Lunar Parallax. 4. 1754, A Transit of Mercury. 5. Elements of Mars. 6. 1755, Longitude of Bëfilin. 7. Lunar Eclipse. 8. 1756, Transit of Mercury. 9. Lunar Parallax continued. 10. 1757, Observations at the Luxembourg. 11. Transit of Venus. 12. Secular Equations and Mean Motions. 13. A Gnomonical Problem. 14. Meridian Altitudes. 15. 1758, Perturbations of Mars by Jupiter. 16. Motions of the Planetary Nodes. 17. Change of Latitudes of the Stars. 18. 1759, Comet of 1682 and 1759. 19. 1760, Sun's Diameter. 20. Perturbation of Venus by the Earth. 21. Eclipse of 1760. 22. 1761, Solar Parallax. 23. Interpolation. 24. Transit of Venus Observed. 25. Solar Parallax. 26. Transit Computed. 27. Observed at Tobolsk. 28. In Denmark. 29. Compasses and the Variation. 30. Perturbation of Mars by the Earth. 31. Planetary Nodes. 32. 1762, Equation of Time. 33. Obliquity of the Ecliptic. 34. Horary Motion in Transits. 35. Nodes of Jupiter's Satellites. 36. Diameter of Venus. 37. Comet of 1762. 38. 1763, Eclipses of Jupiter's Satellites. 39. Solar Eclipses for a Spheroid. 40. Triangles, Rectilinear and Spherical. 41. 1764, Transit of 1769. 42. Lunar Libration. 43. 1765, Motion of Saturn. 44. Eclipses of Jupiter's Satellites. 45. The Third Satellite. 46, 47. 1766, Theory of Mercury. 50. 1768, Opposition of Jupiter. 51. Transit of 1769. 52. Orbit of Saturn. 53. 1769, Lunar Observations. 54. Comet of 1769. 55. Transit of Venus. 56. A Solar Eclipse. 57. Transit of Venus. 58, 59, 60. Comparisons of Observations. 61. 1770, Solar Parallax. 62. Sun's Diameter. 63. Appearances in the Transit. 64. Chappé's Observation. 65. 1771, Theory of Mercury. 66. Astronomical Observations. 67. Solar Parallax. 68. 1772, Transit of Venus. 69. Tides. 70. 1773, Comets. 71. Saturn's Rings. 72. 1774, An Opposition of Saturn. 73. Saturn's Rings. 74. Disappearance of the Ring, at Béziers. 75. 1775, Opposition of Mars. 76. Elements of Mars. 77. Same Latitudes and Longitudes. 78. Opposition of Jupiter and Saturn. 79. An Eclipse of Saturn. 80. 1776, Spots and Rotation of the Sun. 81. 1777, Observations at Paris and Madrid. 82. An Observation of Mercury. 83. Longitude of Padua. 84. The Solar Spots, continued. 85. 1779, Third Satellite of Jupiter. 86. Theory of Venus. 87. Herschel. 88, 1780, Obliquity of the Ecliptic. 89. Precession of the Equinoxes. 90. Fourth Satellite of Jupiter. 91. 1782, Duration of the Year. 92. A Transit of Mercury. 93. 1783, An Eclipse of the Sun. 94. Inclination of the Orbits. 95. 1784, Elements of Jupiter. 96. Ellipticity of the Earth. 97. 1785, Motion of Venus. 98. 1786, Secular Equations of the Sun and Moon. 99. Mass of Venus. 100. Equation of Mars. 101. Mars in Quadrature. 102. Orbit of Saturn. 103. Theory of Mercury, fifth Memoir. 104. Satellites of Jupiter. 105. Fifth of Saturn. 106. 1787, Fernel's Measurement. 107. Herschel's. 108. Jupiter's Third Satellite. 109. Conjunction of Venus. 110. Motion of Saturn. 111. Inclination of Saturn. 112. Answer to Lémonnier on Lunar Observations. 113. Solar Eclipses of 1787. 114. Eclipse of 1666. 115. Caspian Sea. 116. 1787, Eclipse of 1765. 117. 1788, Eclipses applied to Longitudes. 118. Conjunction of Venus. 119. Lunar Parallax, fourth Memoir. 120. Moon's Diameter. 121. Jupiter's Fourth Satellite. 122. Satellites of Saturn. 123. Light of Algol. 124. Height of the Seine. 125. 1789, Epacts. 126. Observations of 8000 Stars, first Part. 127. Motion of Venus. 128. Astronomical Observations. 129. Observation of Mercury. 130. Tides. 131. Catalogue of Stars, second Part. 132. 1790, Disappearance of Saturn's Ring. 133. Interior of Africa. 134. *Mém. Inst.* i. 1798, Orbit of Mercury. 135. ii. 1797, Occultations

of Aldebaran. 136. Solar Eclipse of 1706. 137. Solar Eclipse of 1748. 138. v. 1803, Zodiac at Strasburg. 139. Eclipses calculated. 140. Opposition of Mars. 141, 142. Motion of Venus. 143. Motion of Mercury. 144. vi. 1806, A Transit of Mercury.

145. The earliest of his separate publications appear to have been two little volumes, intended for provincial circulation only, entitled *Etrennes Historiques*, 24mo, Par. 1755–56. 146. Another little article of his miscellaneous works was a *Discours qui a remporté le Prix de l'Académie de Marseille en 1757*, Mars. 1757. The subject was the spirit of justice, as tending to the glory and the stability of a government. 147. We have then *Three Letters on Platina*, *Jour. des Sav.* 1758, Jan. Jun.; 1760, Feb. 148. Letter on a new Sun Dial, *Jour. Sav.* June 1758, ii. 439; the lines being invisible when the sun does not shine.

149. *Tables Astronomiques de Halley*, 2 vols. 8vo, Paris, 1759. Containing several new tables, and an elaborate history of the comet of 1759, of which the author had computed the perturbations, according to the theory of Clairaut. 150. *Connaissance des Temps*, 16 vols. 8vo, Par. 1760–1775; 14 vols. 1794–1807. This work contains, besides the Ephemeris, an important selection of the most useful astronomical papers. On one occasion, for temporary reasons, these papers were published in a separate volume. 151. *Exposition du Calcul Astronomique*, 8vo, Paris, 1762; a companion to the Almanac.

152. *Oraison funèbre de Maurice Comte de Saxe*, 8vo, Par. 1760. 153. *Art du Papetier*, fol. Par. 1761. 154. *Parcheminier*, 1762. 155. *Cartonnier*, 1764. 156. *Chamoiseur*, 1764. 157. *Tanneur*, 1764. 158. *Mégissier*, 1765. 159. *Maroquinier*, 1766. 160. *Hengroyeur*, 1766. 161. *Corroyeur*, 1767.

163. Letter on Delisle's Calculations, *Journ. Sav.* Apr. 1761. 164, 165. In the 52d volume of the *Philosophical Transactions* for 1761 and 1762, we find several papers of Lalande; two on the transit of Venus; 166. One on Norwood's Measurement of the Earth; 167. An Account of a Comet; and, 168. An Account of Occultations of the Fixed Stars by the Moon. 169. In the *Transactions* for 1769, another paper on the Transit of Venus.

170. *Discours sur la Douceur*, 1763. This essay was intended as a sort of exercise for the author's own moral improvement; and he made it a rule to read it over every year, in order to assist him in commanding his temper. He may possibly have derived some little advantage from the practice, but he never acquired enough of self-command to refrain from wounding the feelings of another by any pointed remark that might suddenly occur to him.

171. *Astronomie*, 2 vols. 4to, Paris, 1764; 3 vols. 1771, 1792; vol. iv. 1780, not reprinted. This compilation far excelled in utility all former works of the kind, and will always be considered as exhibiting the most perfect picture of the science, such as it existed from 1760 to 1790, with all the details of practice and computation. Lémonnier called it, with some truth, the great newspaper of astronomy. The Treatise on the Tides, which constitutes the fourth volume, is chiefly a collection of observations, not sufficient even for the basis of a complete theory: an abstract of it may be found in the *Mém. Acad.* Dijon, ii. 1774. 172. *Figure du Passage de Venus de 1769*, Paris, 1764; together with an explanatory memoir. 173. On the Equation of Time, *Recueil pour les Astronomes*, 1765.

174. He undertook the mathematical department of the *Journal des Savans*, from 1766. 175. On the Coins of Piedmont, *Journ. Sav.* Dec. 1767. 176. *Voyage d'un François en Italie*, 8 vols. 12mo: a correct guide and faithful repertory for travellers, containing some scientific information, besides maps of the principal cities. 177. *Dissertation sur la Cause de l'Élévation des Liqueurs dans les Tubes capillaires*, 8vo, Par. 1778. 178. A Dictionary of Astronomy, in the *Encyclopédie d'Yverdon*, 56 vols. 4to, 1770–6. 179. *Abrégé d'Astronomie*, 8vo, Par. 1773, 1795; translated into various languages. 180. Notes on the Mondes Primitifs of Fontenelle, 24mo, Paris; often reprinted. 181. Notes on Bouguer's *Traité de Navigation*. 182. *Mémoire sur le Passage de Venus*, 4to, Par. 1773; with a life of Dr Bevis. 183. *Réflexions sur les Comètes qui peuvent approcher de la terre*, 8vo, Par. 1773. 184. *Lettre à Cassini sur l'Anneau de Saturne*, 8vo, Toulouse, 1773; a violent attack, which was speedily suppressed by the author. 185. *Ephemerides*, 3 vols. vii. viii. ix. Paris, 1774, 1792. This was a continuation of Lacaille's computations, containing also some detached articles of importance; for instance, Hampstead's Catalogue, in the eighth volume. 186. A Celestial twelve-inch Globe, Paris, 1775.

187. The astronomical articles in the Supplement of the Old *Encyclopédie*, about 1776; those of D'Alembert, in the body of the work, having been little more than extracts from Lémonnier. 188. To the *Encyclopédie Méthodique* Lalande contributed a Dictionary of Astronomy, making about one-third of the *Mathématiques*, 3 vols. 4to. They were principally extracted from his own astronomy; and the article Cadran, which is very elaborate, was originally intended for a fifth volume of that work.

189. *Traité des Canaux de Navigation*, fol. Paris, 1778. This

Lamarck. volume is principally descriptive, especially of the Canal of Languedoc. 190. Letter on the Variation of the Compass, as connected with the Temperature of the Earth, *Journ. Sav.* 1780, Sept. 191. Leçons d'Astronomie de Lacaille, 8vo, Par. 1780; with some Notes. 192. Astronomie, in *Bibliothèque des Dames*, 12mo, Par. 1786, 1795.

193. Letter on the name of the planet Herschel, *Journ. Sav.* 1789; objecting to "Uranus." 194. Description d'une Machine de M. Ramsden, 4to, Paris, 1790; the dividing engine, translated. 195. Account of nine Lalandes, *Journ. Sav.* Nov. 1791. 196. Journey to Mannheim in 1791, *Journ. Sav.* 1791. 197. On the Zodiac at Strasburg, *Journ. Sav.* 1791.

198. Abrégé de Navigation, 4to, Paris, 1793, with a full catalogue of works relating to the subject, and many useful tables. 199. A Journey to Mount Blanc, performed in 1796, *Mag. Encycl.* ii. iv., 433. 200. Histoire Céleste Française, i. 4. Par. 1801; containing the catalogue of stars begun by Dagelet, and continued by Michel Lefrançois Lalande, the nephew of the editor. 201. Continuation of Montucla's *Histoire des Mathématiques*, 2 vols. 4to, Par. 1802; making the third and fourth of that elaborate work, but not equally well digested and discussed with the original part. 202. Tables de Logarithmes, 18mo, Par. 1802. 203. Four Memoirs on Ceres, *Journ. Phys.* 1802. 204. Some articles in the *Necrologie des Hommes Célèbres*. He wrote, at different times, Accounts of the Lives of Vicoq d'Azry, Delisle, Commerson, Verron, Me. Lepaute, and Dubocage; and he had undertaken a life of Bucholz, a short time before he died. Commerson had complimented him by making a genus *Lalandia*, transgressing in his favour the classical canon of the botanists, to reserve such honours for the reward of merit in their own department.

205. Bibliographie Astronomique, 4to, Paris, 1803; with a history of the Progress of Astronomy from 1781 to 1802. This useful volume was printed at the public expense, under the auspices of François de Neufchâteau. The author possessed a very extensive collection of astronomical books, and it has been regretted that he did not insert a more complete account of some of the most rare; but the work is already sufficiently voluminous. Some other productions are attributed to him in the *Dictionnaire des Anonymes*; but they would probably have added little to his fame had they been acknowledged.

(Delambre, *Mém. Inst.* viii., 1807. H.P. 30; and Biographie Universelle, xxiii., 8vo, Paris, 1819. Ma. C. de Salm, *Magas Encycl.* 1810, ii., p. 288; including a sketch by himself, written in 1804.) (T. Y.)

LAMARCK, JEAN-BAPTISTE PIERRE ANTOINE DE MONNET, Chevalier de, the celebrated French naturalist, was born of a noble family, at Bazentin, in Picardy, in 1744. Destined by his father for the church, he received the elements of his education in the Jesuits' College at Amiens, where he was distinguished by his abilities and ardent thirst for knowledge; but at the early age of seventeen he relinquished all thoughts of an ecclesiastical career, entered the army, and was attached to the division of the Duc de Broglie, during his contest with Prince Ferdinand of Brunswick, in Westphalia. The young Lamarck exhibited great courage, and received a severe wound in battle; but, on account of impaired health, he was soon compelled to retire from the service.

He then commenced the study of medicine at Paris; but the bent of his mind was to the physical sciences, and he made considerable proficiency in natural philosophy and botany. His first publication was entitled *Recherches sur les Causes des Principaux Faits Physiques*, in which he propounded theories of heat and electricity, which were more fully developed in his subsequent publication, *Mémoires de Physique et de l'Histoire Naturelle*, but which would have been forgotten had it not contained the germ of his speculations on animal life. In 1778 he sent to the Académie des Sciences some ingenious observations *On the Formation of Clouds*; and in the same year he was appointed, through the friendship of Buffon, assistant to Daubenton, in the Cabinet du Jardin du Roi, and was sent, with the son of his patron, into Germany and Holland, to collect rare specimens of plants for the royal collection. More fortunate than his companion, Lamarck survived the horrors of the Revolution, in which the young Buffon fell a victim to the butcheries of Robespierre.

In 1780 Lamarck produced his *Flore Française*, and

undertook to furnish the article *Botanique* for the *Encyclopédie Méthodique*. The first volume of that article appeared in 1783, and a second in 1786; but the Revolution put a stop to his progress in the work, which reached no farther than GOR in the alphabetic arrangement.

It does not appear when he first directed his attention to zoology, but he must have made considerable progress in that science before the Revolution, for in 1793 he was appointed one of the conservators of the superb museum of natural history at Paris, and the care of the invertebrate animals was confided to him. In 1794 he began to give lectures on that branch of zoology, and continued to do so until 1818, when age, and the failure of his sight, rendered him incapable of that duty, and he resigned his office to Latreille, Cuvier's assistant in the entomological department of the *Règne Animal*.

The first result of Lamarck's researches in his department of the museum appeared in a volume termed *Système des Animaux sans Vertèbres*, published in 1801, which may be considered as the forerunner of his great work on this subject, one of the most valuable treatises which has ever appeared on this difficult branch of natural history.

In 1809 he produced his *Philosophie Zoologique*, in two volumes, containing much that is exceedingly valuable; but we here find stated fully the extravagant hypothesis, broached in his *Recherches*, of the progressive development of animal functions, and the production of new organs, by the exertion of the WILL of the individual. This opinion is best given in his own words: "La production d'un nouvel organe dans un corps animal, résulte d'un nouveau besoin survenu, qui continue de se faire sentir, et d'un nouveau mouvement que ce besoin fait naître et entretenir." "Tout ce qui a été acquis, tracé ou changé, dans l'organisation des individus pendant le cours de leur vie, est conservé par la génération, et transmis aux nouveaux individus qui proviennent de ceux qui ont éprouvés ces changements."

The example which he adduces to support this strange doctrine is that of a molluscan gastropod. A snail, for instance, as it draws itself along, he imagines to feel the want of organs for examining the bodies it encounters, and therefore makes efforts with some of its anterior parts to touch those opposing bodies, by which exertion of its will, constantly operating, portions of nervous and other animal fluids must be determined towards its head; such reiterated efforts will in time, he says, cause two or more tentacula to spring from its head; "and this, without doubt, has happened to all races of gastropods, in which necessity has induced the habit of touching bodies with some part of their head!" Were this view to be received as the cause of changes in animal organization, the different species and genera, and even classes of animals, would long ago have been undistinguishable by diversity of organs; and the same laws, applied to the higher animals, would lead to the belief that terrestrial creatures may have derived their origin from the desire of aquatic animals to enjoy atmospheric existence; and even man himself might have passed, by long-continued appetite, from the form of a fish, or may hereafter obtain the wings of a bird!

The work on which the fame of Lamarck justly rests is his admirable *Histoire Naturelle des Animaux sans Vertèbres*, which successively appeared, in seven volumes 8vo, between the years 1815 and 1822. In this work he has founded his classification more on differences in anatomical structure than any of his predecessors in the same branches of zoology, and has therefore succeeded in a more perfect distribution of invertebrate animals. He divides the whole animal kingdom into three primary groups, which he denominates the *Apathetic*, the *Sensible*, the *Intelligent*. In the first he includes the classes—1. Infusoria, 2. Polyparia, 3. Radiaria, 4. Vermes; in the second, 5. Insecta, 6. Arachnidæ, 7. Crustacea, 8. Annelida; 9. Cirripeda, 10. Mol-

Lamas. lusca; in the third he includes, 11. Pisces, 12. Reptilia, 13. Aves, 14. Mammifera. The two first groups comprehend those treated of in this work, and his divisions are in general very judicious, though we must object to his term *apathetic* as applied to his first group.

The doctrine of *appetence* is again stated in the introduction to this work; and, to support his views on this subject, he maintains that the animals of former geological epochs were less perfect in their structure than their existing congeners; but surely the curious forms of fishes described by M. Agassiz as occurring in the oldest strata containing vertebrate remains are as perfect as those of any existing species; and the elaborate sculpture on the dermal plates of the extinct genera *pamphractus*, *cephalaspis*, or *asterolepis*, or the mechanical contrivance by which the armour of the *pterichthys*, or the scales of ganoid and ctenoid fishes of the former world are fitted to their bodies, or the groovings on the remarkable remains termed *ichthyodurooliths*, do not exhibit any mark of less perfect workmanship than we find in the existing creation.

Nor can we subscribe to his ideas regarding some of the apathetic animals (as he terms them). The infusoria he represents as destitute of a mouth or a digestive apparatus, and as nourished merely by *imbibition* through pores on their bodies, as wholly without a *will*, and as moving only by the action of external forces on their irritability. But the researches of Ehrenberg have proved that infusoria are more numerous, and more complex in their organization, than had been before imagined. In Ehrenberg's first class, *polygastrica*, he has described 552 species; and in the second, *rotatoria*, 170; or in all 722 well ascertained species. In the first class he has ingeniously proved the existence of a very complicated digestive apparatus, especially in the genera *vorticella*, *epistylis*, and *opercularia*, and in one of these no less than 120 stomachs or ventricular appendages; while in the class *rotatoria* he has detected eyes in 150 species. Ehrenberg has shown that they swallow food with avidity, and evidently make choice of certain aliment in preference to another, which is certainly an act of *volition*, while some of their movements are evidently produced by their *will*. In describing the *medusaria*, a tribe of radiate animals, Lamarck asserts that they are destitute of control over their own movements, "being without the possibility of directing them." This, however, we have ascertained to be incorrect, by experiments made purposely to ascertain this point. On a calm day, on the Clyde, opposite to the Cumbræ, we anchored a boat where *medusaria*, especially *Ephyra simplex* and *Cyanea cyclonota* abounded, and saw them repeatedly change the line of their progression, when slightly tapped on the apex of their *umbrella* with a fishing-rod. The motion was sometimes downwards, sometimes upwards, or horizontal; and we succeeded even in thus causing them to stem the gently flowing current of a commencing flood-tide by the contractions of the edges of their disks.

Notwithstanding these objections to some of the hypothetical views of this able philosopher, we consider that this great work of Lamarck has most materially contributed to the advancement of zoology. He will ever be considered as one of our great luminaries on the INVERTEBRATA, especially in the five classes of what he terms the *sensible* animals; and the second edition of it, with the notes of Deshayes and Milne-Edwards, of 1835-45, is the best existing manual of the general subject in any language.

Lamarck's last scientific labour was his *Mémoires sur les Coquilles*, in the *Annales du Muséum*, a very valuable treatise on shells, in which he was assisted by Valenciennes and his daughter Mademoiselle Lamarck.

M. Lamarck died at Paris in 1829, in the eighty-sixth year of his age.

(T. S. T.)
LAMAS, or Buddhist priests of Tibet. See TIBET.

LAMB, CHARLES, an original and delightful English essayist and humourist, was born in London on the 10th of February 1775. His parents were poor, but stamped with nature's nobility. His father filled the situation of servant and humble companion to one of the benchers of the Inner Temple, and he obtained for his son Charles, the youngest of three children, a presentation to Christ's Hospital, or the Blue-Coat School. At this ancient and munificent endowment, which maintains, in the heart of the metropolis, 1000 boys, clad in the old costume of its founder, Edward VI., Lamb remained from his seventh to his fifteenth year. He had the good fortune to have for a schoolfellow the celebrated Samuel Taylor Coleridge; and the influence of Coleridge on his younger and more timid associate was great and lasting. A close and tender friendship was formed between them, literary enthusiasm was communicated, and an object or example of successful study and lofty ambition was constantly present to Lamb's imagination. On quitting school, Charles was condemned to the labours of the desk. From 1792 to 1825 he officiated as one of the clerks in the accountant's office of the East India Company. His appointment was small at first, but gradually increased in value and importance, and he finally retired with a pension equal to two-thirds of his salary, or with the liberal allowance of L.450 per annum. During his thirty-three years of uncongenial toil and confinement Lamb never forgot literature. His evenings were devoted to a few favourite authors—the old dramatists, and other quaint or grave sources of "English undefiled,"—to an occasional visit to the theatres, when tragedy was represented by a Kemble, Siddons, or Kean, and the comic muse found joyous expression in Banister, Munden, or Liston; to correspondence with Coleridge; and to efforts, for many years slow and hesitating, at original composition. A sad calamity seemed to blight all his prospects in the very morning of life. There was insanity in his family, and, on the 22d of September 1796, his sister Mary Lamb, "worn down to a state of extreme nervous misery by attention to needlework by day, and to her mother by night," broke out into frenzy, and with a knife pierced her mother to the heart. Charles was at hand to snatch the knife from her grasp, and the unhappy and unconscious author of the fatal deed was placed in an asylum. Reason was gradually restored; and in a few months after the death of their aged father, Charles engaged to take care of his sister for life, and she took up her abode with him. His income at this time did not exceed L.100 a-year; he had to abandon all hopes of marriage, though then only twenty-two years of age; and there was the fearful and constant apprehension of the recurrence of his sister's malady. In fact, the malady did frequently recur throughout her after life. Mary Lamb knew, on each occasion, when the attack was approaching; and Charles, obtaining leave of absence from the office, *as if for a day's pleasure*, might be seen escorting his sister, both in tears, to the accustomed asylum in the neighbourhood of London. No more melancholy incident, and no nobler sacrifice, is recorded in literary history. To us it is more deeply affecting than the madness of Tasso, or the wild delirium of Scott.

Lamb's first appearance as an author was made in 1797, when he contributed some pieces to a small volume, consisting chiefly of poems, by Coleridge and Lloyd. Next year he published a prose tale, *Rosamund Gray*; and in 1799 he was associated with Coleridge and Southey in the publication of a volume of fugitive poetry, entitled *The Annual Anthology*, which was ridiculed by Canning in the *Anti-Jacobin Magazine*:—

"And ye five other wandering bards, that move
In sweet accord of harmony and love,
Coleridge and Southey, Lloyd, and Lamb, & Co.,
Tune all your mystic harps to praise L'epaux!"

Lamb,
Charles.

Lamb,
Charles.

Of the French democrat Lepaux, Lamb had not even heard the name before, and he was the least mystic of writers, either in prose or verse. But he was associated with Coleridge and Southey; and the youthful Canning, in his witty malice and anti-Jacobin zeal, was not disposed to make nice distinctions. Lamb's next literary venture fared no better, though the assault was this time made by a Whig critic. In 1801 appeared his *John Woodvil*, a slight dramatic piece, written in the style of the elder Elizabethan dramatists, and containing some genuine poetry and happy delineation of the gentler passions, but deficient alike in vigour, in plot, and character. The play was seized upon by Jeffrey in the *Edinburgh Review*, and held up, in a strain of ridicule, as a specimen of the rudest condition of the drama, the work of "a man of the age of Thespis." The dramatic spirit, however, was not quenched in Lamb. His next effort was a farce, named *Mr H.*, the point of which consisted in the hero's anxiety to conceal his name, "Hogsflesh,"—a plot so trivial, and so disappointing to the audience, who had yawned through the first act, imagining some great or witty disclosure was to follow, that the piece was sealed with instant and irrevocable condemnation. Lamb made no farther attempt in the difficult walk of the drama, in which many greater spirits have failed, but he bore the disaster with rare equanimity and good humour. He laughed it off among his friends, corresponded largely with a few choice early associates, instituted Wednesday evening suppers, at which shone many bright and subtle intellects, and at length struck into new and successful fields of literary exertion. In 1807 appeared *Tales founded on the Plays of Shakspeare*, written by Charles and Mary Lamb; and in 1808 two volumes of *Specimens of the Dramatic Poets*, with short but felicitous notes. Mary Lamb, in 1809, published a little tale, *Mrs Leicester's School*, and *Poetry for Children*. The establishment of the *London Magazine*, in 1820, formed a great era in the history of Charles Lamb. Many of his friends were connected with the new periodical, and he was stimulated to the production of a series of essays, signed *Elia*, which rose into instant popularity, and may be said to form the chief corner-stone in the small but classic temple of his fame. His curious reading and research—the shrewd observation, fancies, and conceptions of his whole life—were poured into these monthly essays, with many scenes drawn from his past career—its mirthful and mournful experiences. The style is quaintly elaborated, cut into short sentences, the grotesque mingling with the pathetic, and much practical wisdom with a dash of antic folly. In some of the essays, topics of humble and domestic life are set off with lively illustrations, fine satire, or graceful description; others are devoted to criticism, and remarks are thrown out at once original and profound. Perhaps nothing so suggestive or striking in this department of literature had appeared since the days of Steele and Addison. Lamb wrought on a limited canvas, but his combinations and colouring were unique and exquisite. In adding, from time to time, to the number of these essays, gratifying his friends occasionally with a fragment of prose, a letter, or a copy of album verses, Lamb's future days were spent. He was easy—nay, opulent—in his circumstances, and his reputation was daily extending. The unfortunate malady of his sister, however, broke in painfully on his lettered ease and comfort. It continued to increase, with shorter intervals of relief, and Lamb removed to the quiet of the country, residing successively at Islington, Enfield, and Edmonton. He had little enjoyment at any time in such suburban retreats; he would have preferred London to all the charms of Arcadia and the golden age; and he frequently stole in to the Great Babel, to listen to its welcome roar, and pass a festive evening with his friends; this only, however, when Mary was well, and she often accompanied him.

They lived on at Edmonton until Lamb was overtaken by an attack of erysipelas, induced by an accidental fall while walking on the London road, and in a few days the disease proved fatal. He died on the 27th of December 1834. His sister survived till 1847. The sudden death of one so widely known, admired, and beloved as Charles Lamb, fell on the public, as well as on his own attached circle, with all the poignancy of a personal calamity and private grief. His memory wanted no tribute that affection could bestow, and Wordsworth commemorated, in simple and solemn verse, the virtues and genius, and the fraternal devotion, "passing the love of woman," of his early friend. His letters were collected, and his life written, by one of his executors, Sir Thomas Noon Talfourd, and another friend. Mr Edward Moxon, the publisher, has given to the world several complete editions of his works. (R. C.—S.)

LAMB, William, Lord Melbourne, was born in London in 1779. Having received his university education, first at Trinity College, Cambridge, and afterwards at Glasgow, he entered as a student at Lincoln's-Inn in 1797, and was called to the bar in 1804. In the following year he married Lady Caroline Ponsonby, who afterwards became celebrated for her literary talents. In 1805 he entered the House of Commons, and joining the opposition, then led by Fox, he supported that side, without earning any celebrity, during 20 years. On the death of his father in 1828, he succeeded to the title of Viscount Melbourne, entered the House of Lords; and in 1830 became home-secretary, under the administration of Lord Grey. This office he filled till 1834; and in the following year was raised to the Premiership, which he held with great ability till 1841. He died in 1848, in his seventieth year. Possessing no eloquence, and little practical sagacity, Lord Melbourne owed the strength of his government mainly to his personal tact, frankness, and ingenuity; and his premiership is marked by no great event in the political history of the kingdom, the main energies of his party being spent in clinging to office after the reality of its power was gone.

LAMBALLE, a town of France, department of Côtes-du-Nord, on the Gouessant, 12 miles E. by S. of St Briac. It is surrounded by old walls; and has manufactures of woollen, linen, leather, &c., and some trade in agricultural produce. Pop. about 4500.

LAMBERT, JOHN, was born September 7, 1619, in the parish of Kirkby-Malhamdale, in the West Riding of Yorkshire, at Calton Hall, the seat of a family of which he was the representative, and which traced its descent from a daughter of the Conqueror. That his father died when he was thirteen years of age, that he married, when in his twenty first year, a daughter of Sir William Lister, his neighbour, and that he studied the law in an inn of court, but never pursued it as a profession, is all that we find recorded of his early years. When the civil war broke out, he commenced his military career as captain in the parliamentary forces under Fairfax. In the following year we find him bearing the rank of colonel; and the earliest exploits in which he is known to have distinguished himself were—a sadly from Hull on the 11th of October 1643, by which he obliged Lord Newcastle to raise the siege; an engagement at Bradford on the 5th of March 1644, wherein he defeated Colonel Bellasis; and the pursuit of this officer and his troops to Selby, which, being joined by Lord Fairfax, he stormed and took on the 11th of April. The siege of York by the combined forces of Lords Fairfax, Manchester, and Leven ensued; and on the 2d of July, the eventful fight of Marston Moor, in which, along with Sir Thomas Fairfax, he had command of the parliamentary cavalry. The siege of York was recommenced by the victorious army, and Lambert was sent in to a parley with the governor, which ended in the surrender of that city. In January 1645, he was appointed commissary-

Lamb,
William
||
Lambert,
John.

Lambert,
John.

general of the northern army; twice in that year beat the royalists at Keighley and Ferrybridge; and the garrisons of Scarborough, Pomfret, Sandall, Sherborne, Bolton, and Skipton, surrendered to the parliament. In the commencement of 1646 we find him engaged under Fairfax in the west, in subduing the last remnants of the royalist forces in that quarter: we find him at the sieges of Dartmouth, of Truro, and of Exeter, which surrendered, the first on the 20th of January, the second on the 14th of March, and the last on the 9th of April; after which he marched with the army to the siege of Oxford, and was one of the commissioners who negotiated the surrender of that important city, of which he was appointed governor. He was afterwards made one of a select council of five (his colleagues being Cromwell, Ireton, Fleetwood, and Whitelocke), to consult on the disposal of the parliamentary forces for the reduction of the few garrisons which still maintained the authority of the king.

In the struggles for ascendancy between the parliament and the army, in 1647, Lambert brought his legal knowledge and training to bear in advocating the cause of the latter. He was one of the commissioners who, on the 2d of July, attended at High Wycombe, to treat with commissioners from the parliament, and prepared the proposals for the settlement of the kingdom, which they submitted to the parliamentary commissioners at Colnbrooke, on the 3d of August. After delivering these proposals, Lambert was sent into Yorkshire as major-general of the four northern counties. In 1648 he defeated Langdale and Musgrave near Carlisle; and afterwards, along with Cromwell, the combined Scottish and royalist troops, numerically more than twice as powerful as the parliamentary forces. He then followed Cromwell into Scotland, and after a short stay at Edinburgh marched back into England to reduce Pomfret, a strong fortress which the royalists had seized anew. Before this place he arrived in December 1648, and here he remained till after the trial and execution of Charles; events in which he bore no part, and of which we have no evidence of his having approved. Pomfret surrendered soon afterwards; and the parliament, on receiving this intelligence in March 1649, voted thanks to him, and a grant of lands out of the demesnes of Pomfret, of the value of L.300 a-year. When Cromwell became generalissimo of the parliamentary forces Lambert was at the same time made second in command; and the two generals, in June 1650, marched towards Scotland, where Charles II., who had been acknowledged in that portion of his dominions, was at the head of a large army. In a gallant but indecisive action near Musselburgh he was wounded, his horse killed, and himself for a while in the hands of the enemy, but was rescued by his troops. At the battle of Dunbar he led the van, and in the July of 1651 defeated above 4000 of the king's troops at North Ferry, and obtained minor successes in the course of the same month at Inchgarvey and Burntisland. When Charles, after these actions, embraced the bold resolution of marching upon London, Lambert hastened in pursuit, engaged the royal army at Warrington, joined Cromwell at Warwick, and, on the 3d September, took part in the battle of Worcester, where the hopes of the royalists were for a time completely overthrown. After the engagement, parliament voted "that lands of inheritance in Scotland, to the yearly value of L.1000 sterling, be settled upon Major-general Lambert and his heirs, for his great and eminent services for this commonwealth." In the winter of this year, he was made a commissioner, together with Monk, Vane, St John, and four others, for the settlement of affairs in Scotland, where he remained a very short time, being, on the death of Ireton, appointed by the parliament, in January 1652, to succeed him as lord-deputy of Ireland. But the term of this office was limited to six months, and Lambert, filled with displeasure against the parliament, declined the proffered post.

Lambert,
Johann
Heinrich.

In the events which led to the assumption of the supreme power by Cromwell as lord-protector, he took a leading part; and in the new parliament, taking his seat as member for the West Riding of Yorkshire, consistently carried out his political views. He vehemently opposed the idea of investing Cromwell with the title of king; and though the offer of that title was carried in parliament, his opposition, and the murmurs of the army, with which he had much influence, induced Cromwell to decline it. When the lord-protector accepted all the other attributes of royalty, on his second inauguration, May 12, 1657, Lambert, in disgust, refused to take the oath of fidelity to the protector; gave up his commissions, which brought him a yearly income of L.6000, and retired on a pension of L.2000. On the accession of Richard Cromwell, and the meeting of a new parliament in January 1659, he was elected for Aldborough and Pomfret, and took his seat for the latter. The next twenty months were the most active period of his life. He became the life of the extreme republican and independent party, known as the "Fifth Monarchy men;" and it was chiefly by his efforts that Richard Cromwell was deposed. But his party felt that it was dangerous to attempt to govern without some semblance of civil administration; so the members of the long parliament, excluded by Cromwell in 1653, were invited to assemble; and this remnant, ridiculed under the name of "the Rump," met as a parliament on the 7th of May. Order was for a while restored; but the royalists were encouraged, by the state of the country, to make a bold effort for the restoration of Charles. Lambert was commissioned to suppress the insurrection, which he did easily and effectually at Nantwich. His influence with the army now made him an object of dread and suspicion to the parliament. On a rash motion of Hazlerig, that he should be sent to the Tower, he instantly dissolved the house, as Cromwell had done before; and the chief power again reverted to the small but formidable faction of which Lambert was the soul. Meanwhile, Monk commenced his celebrated march from Scotland, with the intention of restoring the power of the parliament. Lambert set out to meet him at the head of 7000 men, but in his absence the power of his party began to crumble away; the Rump resumed its authority, and one of its first acts was to disband Lambert's forces, and order him to return to his own house. Desertion had thinned his ranks; to resist was useless; he obeyed, and being thought too dangerous and powerful to remain at liberty, was soon afterwards committed to the Tower. In April, when Monk had almost withdrawn the mask, and appeared as the restorer of monarchy, the republicans again turned their eyes towards Lambert. Apprized of their wishes, he escaped from the Tower, and hastened into Warwickshire, where, on the 13th of April, he placed himself at the head of six troops of horse, and several companies of foot. He was met near Daventry, on the 21st, by an equal force, under the command of Ingoldsby. His soldiers refused to fight; and he was captured and again committed to prison.

After the restoration of Charles II., Lambert, though not a regicide, was excepted out of the bill of indemnity. He was tried along with Sir Harry Vane, found guilty, and condemned to death; but his punishment was commuted to imprisonment for life in the island of Guernsey. He remained in that island till his death, which occurred about thirty years afterwards. The favourite pursuits of his later years were botany and painting. It does not appear that he devoted any part of it to literature, or left any record of the great events in which he had been engaged.

(See Whittaker's *History of Craven*; May's *History of the Parliament*; Whitelock's *Memoirs*; Ludlow's *Memoirs*; Clarendon's *History of the Rebellion*, and *Life of Himself*; Rushworth's *Collections*; *State Trials*.) (T. H. L.)

LAMBERT, Johann Heinrich, a natural and moral philoso-

Lambert. pher of great talent and originality, born on the 29th of August 1728, at Mülhausen, in Upper Alsace, was the son of a French refugee in a very humble station, and one of a numerous family.

His early studies were only assisted by the instruction he obtained at a small free school in his native town. His father, who was a tailor, could scarcely even afford him leisure from mechanical labour. He was obliged to read and write in the night; and, in order to procure candles, he made little drawings for sale, while he was watching the cradle of his infant sisters. Having learned to write a good hand, he obtained some employment as a copying clerk in the chancery of the town, which he gave up when he was only fifteen, upon being appointed book-keeper at some iron-works in the neighbourhood. At seventeen he became secretary to a Doctor Iselin, who was the editor of a newspaper at Bâle, and who became his firm friend through life. He had now time to render himself familiar with the works of Wolf, Locke, and Malebranche, to which he was in a great measure indebted for the correct logical method that he ever afterwards followed in his researches; having, however, confirmed and improved it by the study of the mathematics, to which he devoted himself with great zeal, and which, after all, constitutes the best practical school of genuine logic.

In 1748, he removed to Coire, having been recommended by Iselin, as private tutor to the family of the president, Count Peter de Salis, whom he undertook to instruct in history and religion, as well as in languages and science. The library of his patron was extensive; he profited by it in all its departments; and his residence at the house of an accomplished statesman, frequented as it was by the best-informed persons of different countries, and with different pursuits, could not but greatly contribute to the extension of his knowledge, and the improvement of his taste. He even amused himself with some poetical exercises in various languages, which must, at least, have been of advantage to his style in prose. He felt the importance of his literary and scientific pursuits to himself and to the world; and in 1752 he determined to keep a journal of all his studies, which he continued throughout his life. He began to publish a variety of fugitive pieces, on different subjects, in the newspapers and in other periodical works of the day, some of which attracted the notice of his learned countrymen; and, in 1754, he was made a member of the Physico-Medical Society, then lately established at Bâle, to the Transactions of which he contributed many interesting papers. In 1756 he went to Göttingen with two of his pupils, and in 1757, to Utrecht. The next year the party returned to Coire, by way of Paris, Marseilles, and Turin. At Paris he paid a visit to D'Alembert, who does not appear at that time to have appreciated his merit very highly, though he afterwards rendered him some services with the King of Prussia; but he became more intimately acquainted with Messier the astronomer.

In 1759 he quitted the family of the Count de Salis, and went to settle at Augsburg, having a small salary as a member of the Electoral Academy of Bavaria. From 1761 to 1763 he was again at Coire and in its neighbourhood, being employed in fixing the boundaries between the country of the Grisons and the Milanese territory. Towards the end of 1763, having had some disputes with the Bavarian academicians, he went to Leipzig, and the next year to Berlin, where he was made a member of the Royal Academy of Sciences, and where he continued to reside during the remainder of his life, receiving many marks of favour from the discriminating liberality of Frederick: thus, in the year 1770, he was made superior counsellor of the Board of Works, with an additional salary. He contributed a number of valuable memoirs to the collection of the Academy; and in 1774 he undertook the di-

rection of the *Astronomical Almanac*, for which he was admirably qualified. He was also a constant writer in the journal published by Nicolai, under the title of the *Universal German Library*; and he kept up a very extensive correspondence on various subjects of literature and science.

He was regularly in the habit of writing or reading from five in the morning till twelve, and again from two till midnight; a degree of application unquestionably far beyond that which would have been best calculated for producing the maximum of valuable effect. Perhaps, if he was paid for writing by the ream, he may have earned as much from the booksellers as he would have done by a more judicious economy of his powers; but a nervous system, attenuated by the daily study of seventeen hours, could never have been capable of being employed in any very elevated flights of genius, or in the invention of any sublime or exquisite novelties, either in science or in literature; and it is only wonderful that he did anything so well, as almost to form an exception to this general remark. He was indeed supposed to have injured his health by continued application, and he died consumptive, on the 25th September 1777, at the age of forty-nine. He had never been married. His person was of the middle size, with an interesting and expressive countenance; he was animated and lively in conversation, and liked discussion, but not disputation. He had no literary quarrels; and his criticisms were not offensive, even when they ceased to be flattering. His morals were strictly correct, but his manners were not altogether in unison with those of the society to which his talents had elevated him. He is said to have been timid, awkward, slovenly, and fond of low company; but upright, patient, unostentatious, and compassionate; essentially modest, but as ready to assert his own merits as to admit his defects. He had a happy facility in managing the instruments of computation, especially in the arrangement of converging series; and he had a peculiar talent for expressing the results of observation by an analytical formula, having first thrown them into the form of a geometrical diagram to assist his invention; a process which he employed with regard to the probabilities of life in London, and to the inequalities of Jupiter and Saturn. In short, after Euler, Lagrange, D'Alembert, and Daniel Bernoulli, there are few mathematicians and natural philosophers of any age who can be put in competition with him, and still fewer who benefited the public by so many diversified labours.

It would be hopeless to attempt to pursue his indefatigable pen through all its wanderings: and a complete catalogue of his works would be as useless as it is unattainable. A man who wrote so incessantly must have written many things which were destined to oblivion from their first production. It will be sufficient to mention the most remarkable of his works, without any very strict regard to the priority of their publication.

1. In the *Acta Helveticae of the Society of Bâle*, ii. 1752, we find an Essay on the Force and Measurement of Heat, a subject which the author resumed in the latter part of his life. 2. A General Series, somewhat resembling Taylor's, *Act. Hel.* iii. 1758. 3. Meteorological Observations, *ibid.* 4. He also published a paper on the Vibration of Chords, in the same collection.

5. *Les Propriétés les plus Remarquables de la Route de la Lumière par les Airs, et en général par plusieurs milieux Réfringents*, Hague, 1759, in 8vo; German by Templehof, Berl. 1773. This work does credit to the ingenuity and mathematical abilities of the author, though its results may be obtained in a simpler manner by some methods more recently invented.

6. *La Perspective Libre*, Zurich, 1759, 8vo; another edition in German. The second German edition, 2 vols. 8vo, Zurich, 1773, contains some additional matter, especially a system of geometry, depending, as it is said, upon the ruler alone, without any other instrument. Such a system must, however, have been extremely limited in its application, much more so than Mascheroni's *Geometria del Compasso*.

7. *Photometria, sive de Mensura et Gradibus Luminis, Colorum, et Umbrae*, Augsb. 1760, 8vo. This original and interesting volume includes and supersedes the greater part of Bouguer's experimental determinations. It contains the important discovery, that a lumi-

Lambert.

Lambert. nous surface emits its light with equal intensity in all directions; together with some improvements in the theory of twilight, and an investigation of the comparative light of the sun and moon, and stars and planets.

8. *Insigniores Orbitæ Cometarum Proprietates*, Augsb. 1761, 8vo. We here find the elegant theorem for expressing the relation of the area of a sector to the sides of the triangle inscribed in it. This theorem had been demonstrated with respect to the parabola by Euler in 1740: but Lambert first extended it to the other conic sections, and he certainly re-invented the whole, without being aware of what Euler had done. It may be found, together with a concise demonstration, and a further account of this work, in the translation of Olbers' *Essay on Comets*, published in the *Journal of the Royal Institution*.

9. *Cosmologische Briefe*, Augsb. 1761, 8vo. A French translation of these Letters on the Universe appeared in the *Journal Helvétique de Neuchâtel*, 1763-4; an extract was published by Merian, with the title of *Système du Monde*, Bouillon, 1770, Berlin, 1784, in 8vo; and a translation by Darquier appeared at Amsterdam, 1801, in 8vo. The whole work is written in a popular style, and adapted to the taste of general readers. The author's favourite idea was to make the sun a sort of planet, revolving round some other great body; and he supports the opinion by an argument derived from the supposed insufficiency of the laws of gravity, as relating to the solar system, for explaining some of the inequalities of the motions of Jupiter and Saturn, which have, however, since been reduced to the general analogy by Lagrange and Laplace.

10. *Zusätze zum Traité de Nivellement Von Picard*, 12th August 1761, explaining some improvements on Picard's level, executed by Brander, an ingenious artist, whom Lambert also assisted in the improvement of Gunter's sliding rule. 11. He published an explanation of this scale, entitled *Logarithmische Rechenstäbe*, 12th August 1761.

12. Remarks on Incommensurable Quantities, *Mém. Ac. Berl.* 1761. A demonstration of the incommensurability of the circumference of a circle to its diameter, which has been adopted by Legendre in his Geometry. It depends on the method of reducing a fraction to its lowest terms, as laid down by Euclid, and on the properties of continual fractions; an expression is obtained for a tangent in terms of the arc from the quotient of the series for the sine and cosine, and the continual fraction thus obtained is proved to be infinite. It is also shown that the ratio of the arc to its tangent can never be expressed by any finite quadratic surds. 13. On the Specific Gravity of Salt, and of its Solutions, *M. Berl.* 1762.

14. *Novum Organum*, Leipzig, 1763, in German, two vols. 8vo. An attempt to restore and improve the Aristotelian method of syllogism, in which the author is allowed to have displayed much ingenuity, though its success was greatly limited, on the one hand, by the sober good sense of the empirical reasoners of the school of Bacon and Locke, and on the other, by the wild enthusiasm of the German innovators, who were beginning to be intoxicated with the high-sounding phrases and exaggerated pretensions of the disciples of Kant. A manuscript Latin translation of the work, by Pfeiderer, was once in the possession of the late Lord Stanhope.

15. A paper on Trigonometry appears in the *Nova Acta Eruditorum* for 1763. 16. In the *Berlin Memoirs* for the same year, we find an Essay on Acoustic Instruments, investigating the best forms for hearing-trumpets. 17. Remarks on the Properties of Equations of all Degrees. 18. On Divisors of Equations, which may be found without solving them. 19. On some Measurements relating to the Intellectual World; that is, on probabilities and expectations.

20. *Beyträge zur Mathematik*, Berlin, 1765, 1770, 1772, in four vols. 8vo: a collection of essays on every department of mathematical science. The first volume contains Remarks on Trigonometry and on the Certainty of Observations: on the Divisors of Numbers, and on Annuities; the second, Tables of the Moon: an Essay on Dialling, and on Geographical Projections, with the Elements of Trigonometry, a subject which was afterwards resumed by the younger Mayer; in the third volume there is an Essay on Interpolation, Remarks on Celestial Maps, with other articles.

21. Description of a Table of Eclipses, *Berl.* 1765, with the easiest mode of computing them. 22. In the *Memoirs of the Academy of Berlin* for 1765, we have a paper on Projectiles, including the effect of resistance. 23. In those of the *Bavarian Academy* for the same year, some remarks on the Improvement of Terrestrial Measurements; and, 24. Meteorological Observations. 25. In the *Nov. Acta Erud.* for 1765, An attempt to employ Calculation in the Moral Sciences. 26. On the Magnet, *Ac. Berl.* 1766. 27. Another paper on Magnetic Currents. 28. A Magnetic Chart was published separately the same year. 29. Remarks on the General Outline of the Ocean, *Ac. Berl.* 1767. 30. A General

Solution of the Problem of Three Bodies by means of Series, *ibid.* 31. Notes on Richer's Philosophical Algebra, 1767.

32. Remarks on the Velocity of Sound, *M. Ac. Berl.* 1768; an unsuccessful attempt to reconcile the theory with observation. It was reserved for Laplace, by a single happy suggestion, to remove the whole difficulty. 33. On Photometry, as applied to Painting, *ibid.* 34. Trigonometrical Observations, *ibid.*

35. De Topicis Schediasma, 1768. 36. Remarks on the Divisors of Numbers, *Nov. Act. Erud.* 1769. 37. Anmerkungen über die Brander'schen Micrometern, Augsb. 1769. Brander's micrometers were of glass.

38. Experiments on Hygrometry, *M. Acad. Berl.* 1769; relating to evaporation, and to the indications of hygrometers, especially those of catgut.

39. *Supplementa Tabularum Logarithmicarum*, 8vo, *Berl.* 1770; with a valuable introduction in German, on the abridgment of computations.

40. Anmerkungen über die kraft des Schiesspulvers, 8vo, *Berl.* 1770. In this investigation of the force of fired gunpowder, the author attacks several points in the theory of Robins, published a few years before.

41. *Hygrométrie*, 4to, Augsb. 1770.

42. On Directors for the Light of Lamps, *M. Acad. Berl.* 1770.

43. On Ink and Paper, *ibid.* 44. Analytical Observations, *ibid.*; relating to the general theorem resembling Taylor's, which was further discussed by Euler, and modified by Lagrange. 45. On Taxeometry, or the Measurement of Order, *ibid.*; considered as comparable in degree, and expressible by numbers.

46. *Architectonik*, 2 vols. 8vo, Riga, 1771; a logical and metaphysical treatise on the most simple bases of philosophical and mathematical knowledge, written in 1763. The last part, which relates to magnitude, is the most approved; but the whole work was never much read, being partly superseded by the more ostentatious novelties of the day.

47. In the *Berlin Memoirs* for 1771, we find papers on Meteorology. 48. On the Atmospheric Influence of the Moon. 49. On Achromatic Telescopes of one kind of Glass only. 50. On the Apparent Paths of Comets. 51. On the Grounds of Superstitious Belief, as compared with Probability.

52. Ueber das Farbenpyramide, 8vo, *Berl.* 1772; a description of a pyramid of wax, intended for the illustration of all the possible varieties of combination of the primitive colours.

53. *Astronomisches Jahrbuch*, *Berl.* 1774-9, in 8vo; an accurate and extensive ephemeris, with many original communications annexed to it.

54. In the *M. A. Berl.* 1772, a paper on Friction; supposed to follow the law of the resistance of fluids, with some remarks on that resistance. The opinion of the uniformity of the force of friction, which was even at that time general, was somewhat too hastily rejected by the author; but his computations may still be of use in some cases. 55. On the Fluidity of Sand; as resisting motion. 56. On Hygrometry; continued. 57. On the Density of the Air, with respect to sound and to refraction.

58. *M. A. Berl.* 1773: A Ballistic Scale, for determining the paths of projectiles in the atmosphere. 59. Physical Observations, relating to Meteorology and to Optics. 60. On the Satellite of Venus; affording a remarkable instance of misapplied labour and ingenuity. 61. A Second Essay on Taxeometry. 62. A Note on the Inequalities of Jupiter and Saturn; intended to confirm the principles advanced in the Cosmological Letters. The detail was reserved for a subsequent volume.

63. *M. A. Berl.* 1774: On the Temperament of Musical Instruments. 64. On the Aerial Perspective. 65. Report on a Bedstead for Sick Persons.

66. *M. A. Berl.* 1775: On the Elasticity of the Air. 67. On Wind-mills, and on the Force of the Wind. 68. On the Sounds of Flutes; an elaborate comparison of the various tones of a flute, with the theory of Daniel Bernoulli for determining the sounds of compound organ-pipes.

69. *M. A. Berl.* 1776: On the Strength of Men employed in Labour. 70. On Imperfect Fluids.

71. *M. A. Berl.* 1777: On the Elasticity of the Air.

72. *M. A. Berl.* 1779: Two Memoirs on the Inequalities of Jupiter and Saturn.

73. *Pyrometrie*, 4to, *Berl.* 1779; a posthumous work, upon a subject which had long occupied the author's attention; with a Preface by Karsten, and a Biographical Memoir by Eberhard.

74. A Paper on Annuities, *Leips. Magaz.* 1780.

75. *Deutscher Gelehrter Briefwechsel*, *Berl.* 1781-7, in 5 vols. 8vo; published by John Bernoulli, and consisting principally of the author's correspondence with Holland, Kant, Karsten, Segner, Basedow, Scheibel, and Brander. The contents are more fully described by Lalande. *Bibl. Astr.* p. 584.

76. *M. A. Berl.* 1783: On Friction.

Lambert.

Lambourn 77. Logische und Philosophische Abhandlungen, Berl. 1787, in 2 vols. 8vo. Edited by J. Bernoulli.
 || 78. On the Theory of Parallel Lines, *Hinderb. Arch. der Math.* i.
 Lamen- (Bernoulli in *Nouvelles Littéraires*, 8vo, Berl. 1777; Eberhard in
 nais. *Pyrrometrie Briefwechsel*, iii., *Phil. Mag.* May 1804; Aikin's *General Biography*, vi. 4to, Lond. 1807; Servois in *Biographie Universelle*, xxiii., 8vo, Par. 1819.) (T. v.)

LAMBOURN (CHIPPING), a market-town of England, county of Berks, on a small tributary of the Kennet, 7 miles N.N.W. from Hungerford. The chief buildings are the parish church, an ancient cruciform edifice, a Wesleyan chapel, and several alms-houses. Pop. of parish (1851) 2577.

LAMEGO (the ancient *Lameca*, *Lamacum*), a town of Portugal, province of Beira-Alta, near the Douro, 46 miles E. from Oporto. It was the residence of the Moorish court till 1038, when it was captured and occupied by Ferdinand the Great of Castile. Here also the famous cortes of Portugal are supposed to have been held in 1143 or 1144. It is surrounded by a wall, and has a cathedral, founded by Count Henry, father of the first king of Portugal, about the middle of the fourteenth century; a church called Almacave, a college, a bishop's palace, a nunnery, three monasteries, and two hospitals. It is an episcopal city; and though of great note in former times, is now somewhat uninteresting. Pop. 9000.

LAMENNAIS, FELICITÉ ROBERT, ABBÉ DE, was the son of a wealthy shipowner, and born at St Malo in 1782. In the social troubles of the time, his education was neglected; but, learning the rudiments of Latin from his brother, he picked up the remainder as best he could, and with marvellous rapidity. At the house of an uncle, whither he was sent when about twelve years of age, he read philosophy and romance at will, until his mind, deepening in emotional and religious fervour, recoiled from all mercantile pursuits. In 1807 he became teacher of mathematics in the college of his native town, where his family had considerable influence. His first work, *Réflexions sur l'Etat de l'Eglise en France, pendant le 18^e Siècle* (pub. 1808), was mainly directed against the philosophy which he had so eagerly explored and devoured in his youth, and the baneful effects of which were felt everywhere in the religion of his country. Lamennais took the tonsure in 1811, but he was not ordained priest till 1816, having been banished during the Hundred Days for a violent pamphlet written against Napoleon I., and been compelled to earn his bread as usher in a school near London. His greatest work, the *Essai sur l'Indifférence en Matière de Religion*, was published soon after his return to France, and procured him the offer of a cardinal's hat from Pope Leo XII. It was his last service of faith to the Church of Rome. His love of civil liberty hurried him soon after into conflict with it, and his next volume, touching the relation of religion to civil and political order, subjected the "Second Bossuet" to a fine from the Cour Correctionnelle. This did not, however, deter him from pushing on to a solution of the problem, always a favourite one with the laity of France, how civil liberty can consist with religious despotism. A journal, called *L'Avenir*, was started to enforce his views, and for its vigorous and intrepid thinking, as well as its pure and eloquent style, it soon became a favourite with the democracy of the capital. With every one who had agitated the same question before, Lamennais was found to have rushed from the idolatry of absolute power to the idolatry of absolute individual independence. The complete separation of the temporal from the spiritual power he proclaimed as the only resting-place for his faith; universal suffrage as the only guarantee of his freedom. An encyclical letter from the Pope in September 1832, scattered the coterie of his admirers, who chose to be catholic rather than liberal; and the journal was allowed to drop, towards the close of that year. In 1834 he published his

Paroles d'un Croyant, which was condemned almost immediately after by Gregory XVI. Undeterred, Lamennais continued his labours, and while the liberal party in the church contented themselves with enforcing the claims of science and the freedom of literature in the milder pages of the *Université Catholique*, his pen was busy in the cause of revolution, with all the ardour of a man who felt that the bridge was broken down behind him. On his deathbed he resisted all the efforts used to make him retract, and chose to die unreconciled to the church (February 27, 1854). At his own request, no religious rites were performed at his grave. Certain papers, which he earnestly desired to be published, were detained by his relatives in their zeal for the church, but have recently been handed over to the person named for their publication. The spirit of Lamennais' philosophy is essentially ecclesiastical. He followed the path which M. de Maistre had opened up, stepping on a prostrate philosophy in the hope of substituting faith for knowledge, and authority for investigation. In the church of all ages, he finds the one great channel through which God has communicated truth to his creatures. To justify a retreat into this last sanctuary of philosophic despair, it is necessary to make good a thorough philosophic scepticism. This he makes a show of doing on philosophical grounds, but in reality wielding only a passionate misanthropy and mysticism, which can gain only the broken and dispirited in the pursuit of knowledge. Like all who have laboured in the same path, Lamennais seems to have been unconscious of the circle in which he was whirled, and blind to the principle, that philosophically to establish universal scepticism is equally valid to establish a scepticism against scepticism, as to establish a scepticism against philosophy itself. Having abandoned a criterion of truth for the individual, his only resort is to seek it in the race; and in the history of the human family there is but one unchanging element of truth,—one school of verity where doubt does not enter,—viz., the church. With the patriarchs, the palladium of truth was deposited, and the sacred treasure has been preserved by the Jews, to become, under the Christian dispensation, the exclusive property of the Catholic priesthood. The popedom is the living centre of universal consent. Although this is really a theology, it has been by Lamennais beautifully arrayed in the philosophic dress. This is the only secret of its influence. Lamennais may be said to have furnished the most powerful refutation of his scheme, when he advocated the independence of the clergy, and died a martyr to the truth of his own personal convictions. In his political struggles his philosophy vanished, and passed into the hands of De Bonald, Ballanche, and others of the same school, who have sought to seize on some primeval faith, and disentangle it from the doubts and questionings of a personal philosophy.

His published works not already mentioned are—*Les Affaires de Rome*, 1836; *Le Livre du Peuple*, 1837; *Le Pays et la Gouvernement*, 1840; *De la Religion*, 1841; *Le Guide du Premier Age*, 1846; *Une Voie de Prison*, 1846; *Les Conseils de l'Abbé Lamennais au Peuple*, 1849; and *Esquisse d'une Philosophie*, 4 vols. 1840-46. The *Paroles d'un Croyant* have been translated into English.

LAMIA, or ZERTUN, a town of Greece, capital of the government of Phthitis, is situate near the head of the Gulf of Volo, not far from the Turkish frontier. It is generally well built, and is said to bear a considerable resemblance to Athens. It has a citadel, barracks, and military hospital. Pop. about 4000.

LAMMAS, a festival held on the first day of August. Some suppose it to have derived its name from the practice of bringing a live lamb on that day to high mass, but this seems a mere local custom peculiar to York. Others regard it as equivalent to loaf-mass, or harvest offering of bread from new corn. A balder meaning is attached to it

Lamia
 ||
 Lammas.

Lammer-
moor Hills
Lamp.

by Johnson, who makes it a corruption of *Lattermath*, or *second-mouing*. The proverb "at latter Lammas," like the Roman *ad Græcas calendas*, is a euphemism for *never*.

LAMMERMOOR HILLS, a range of hills stretching from the S.E. extremity of Edinburghshire, through the counties of Haddington and Berwick, and terminating in the cliffs round St Abb's Head. The principal summits attain an elevation of nearly 1600 feet. The upland districts are used for pasturing sheep, but the cultivated tracts ascend pretty high along the lower slopes. See HADDINGTONSHIRE, &c.

LAMOTTE-FOUQUÉ, FRIEDRICH-HEINRICH-KARL, BARON DE, one of the modern poets of the romantic school, was born at Brandenburg, 12th Feb. 1777. His ancestors, who had been driven from France by the revocation of the Edict of Nantes, belonged to one of the most ancient families in Normandy; and his grandfather (Henri August Baron de Lamotte Fouqué), was a general in the Prussian service, had fought in the Seven Years' War, was wounded and taken prisoner at Landshut, and throughout the whole of his career enjoyed the intimacy and friendship of Frederic the Second. Entering the Prussian army at a very early age, the youthful Fouqué served as a lieutenant of cavalry in several campaigns; but at the peace of Basle retired to the country, and devoted himself to literature. About this time he published, under his assumed name of Pellegrinus, a translation of the *Numantia* of Cervantes, several dramas, the romance of *Alwin*, and *Die Historie des Edeln Ritters Galmy, und einer Schönen Herzogin aus Bretagne*. Hitherto he had been an imitator of Cervantes and Spanish writers; but now the Scandinavian literature, a taste for which had been revived in Germany, won his admiration; and in 1809 he published, under his own name, the poem of *Sigurd der Schlangentöchter*, in which the chivalry of the old northern romances is successfully copied both in spirit and life. In 1813 there appeared his masterpiece, *Undine*, a wild and supernatural tale, original in its conception, and told with great descriptive power and exquisite tenderness of emotion. It has been translated into all the languages of Europe. The same year summoned him from his studies to defend his country against the French. He fought valiantly in several battles, rose to the rank of captain, and, when attacked by ill health, retired with the title of major, at the time when the allied armies were about to cross the Rhine. He fixed his abode at Nennhausen, the property of his second wife Caroline, who was herself a popular novelist. In 1814 appeared his *Corona*, an epic poem; and in the following year *Die Fahrten Thiodolfs*; *Der Zau-*

berring; and *Singers Liebe*. After he had produced, in 1821, *Der Verfolgte*, and the romance of *Bertrand du Guesclin*, and in 1828, *Der Sängerkrieg auf der Wartburg*, he relapsed into comparative inactivity, during which he seems to have passed from an admiration of the mythology and chivalry of olden times to an extravagant esteem for their feudal government. His next work, *Die Weltreiche*, a poem published in 1835, showed that his former fascinating vivacity was considerably subdued, and that his thoughts, now growing grave and stern, were also becoming narrowed to the sentiments and feelings of a class. The quaintness of his style remained to give a charming brilliancy to the current of his thoughts, but failed to reconcile the public to his political opinions. His *Zeitung für den Deutschen Adel* (Paper for the German nobility), printed in 1841, tended only to diminish his popularity. Fouqué died at Berlin, in January 23, 1843, before the publication of his last work, *Abfall und Busse, oder der Seelenspiegel* (Apostasy and Repentance, or the Soul's Mirror).

Lamotte-Fouqué must ever be regarded as the most successful writer of the romantic school, which numbers amongst its disciples Tieck, Novalis, Hoffmann, Brentano, and Arnim. His mysterious knights, gnomes, and fairies, with their world of enchanted forests and talking trees, are described with a wonderful facility of poetic artifice; but at the same time he always wraps a deep and true moral in the disguise of supernatural imagery. His romances have also this distinguishing characteristic, that they are more purely romances than the works of most writers of the same school, and the gay visions which he depicts float at a safer distance above the realities of common life. Although it has recently become the fashion in Germany very much to underrate Fouqué's merits, later writers, such as Vilmar (*Geschichte der deutschen National-Literatur* 1856), regard him with higher favour. They hold him to be at least entitled to the merit of a skilful renaissance from the heroic poems of the twelfth century. His poetical works, however, are not so successful, as the themes are generally placed in a region much too high for his genius.

Besides the works above-mentioned, Fouqué published *Vaterländische Schauspiele*, 1811; *Altsächsische Bilder-saal*, 1818; *Lebensbeschreibung des Generals Henri Aug. Baron de la Motte Fouqué*, 1824; *Geschichte der Jungfrau von Orleans*, 1826; *General von Rüchel*, 1828; *Erzählungen und Novellen*, 1833; *Von der Liebeslehre*, 1837; *Goethe und Einer seiner Bewunderer*, 1840; *Selbstbiographie*, 1840; *Ausgewählte Werke*, 1841; *Der Pappenheimer Cürassier*, 1842.

L A M P.

A LAMP is a contrivance for producing light by the combustion of such materials as are fluid at common temperatures, such as most of the fixed oils; the solid fats being made into candles. The kind of oil used for burning in lamps varies, in different parts of the world, with the sources of supply. Whale oil is used in Great Britain, but seal oil, fish oil, and oils obtained from seeds by pressure are also largely consumed. In Paris the oils of rape-seed, and of poppy-seed are used; and in the S. of France, and in Italy, an inferior kind of olive oil, and also the oil of the earth-nut are employed. In the latter country a lamp oil is expressed from grape-stones. In Piedmont walnut oil is common; oil of sesamum-seed is burnt on the eastern and southern coasts of the Mediterranean; while in tropical countries cocoa-nut oil, which is solid in the climate of Great Britain, is generally used. In China, the *Camellia oleifera* is cultivated for the sake of the oil obtained from its seeds, also a shrub, *Croton sebiferum*, the fruit of which

yields a useful oil. In consequence of the deficient supply of tallow during the late war with Russia, inquiries have been set on foot in various parts of the world as to the seeds and other vegetable products from which oil may be obtained, and the result of these inquiries has already shown that many oil-yielding substances, not before known in commerce, exist. The export of oils from the East Indies, especially, *gingelly*, has greatly increased. Pistachio-nut oil is becoming common, as is also ground-nut oil from Africa. All these oils are used for burning in lamps.

Before a combustible can be made available for the purposes of artificial illumination, it must be decomposed in so regulated a manner that its hydrogen may furnish a steady flame, and its carbon the requisite amount of illumination; for which purpose the oil or fatty substance; whether in lamps or candles, must first be made fluid and then gaseous, the gaseous portion, resulting from the decomposition, by heat, of the fluid, filling the interior of the flame, combining

Lamp. with the oxygen of the surrounding air, and becoming dissipated as products of combustion, after having diffused both light and heat around. In a candle the combustible matter is rendered fluid by the heat of the flame, which forms the tallow just below it into a very perfect cup, which it keeps filled with liquid fat, and this is raised by the capillary attraction of the wick into the flame, where the chemical changes take place which result in the production of light and heat. In a lamp a similar action goes on, only the fluid combustible matter is contained in a separate reservoir, the position of which must be such as to cast as little shadow as possible. The simplest form of lamp consists of a thin layer of oil upon a quantity of water contained in a glass vessel, in which is floated a small brass cup, containing a glass tube, fitted by means of cork. The oil rises up the tube above the level on the outside, but when flame is applied to the top of the tube, the oil takes fire and burns with a small feeble flame: the fluid within the tube is depressed by the heat, and the pressure of the oil on the outside tends to overcome the depression, thereby maintaining the oil at the required height. If the tube exceed a capillary bore, the oil will not burn. In some cases, a waxed wick about an inch long is passed through the centre of a compound disk of cork and card, and this, with the cork undermost, is placed upon the oil floating on water in the glass vessel. This lamp, which gives a faint light, is called a *vielleuse*, and is sometimes used in France in bedrooms. Not more complex than this simple contrivance is the arrangement of the antique lamp (figs. 1, 2), which, with

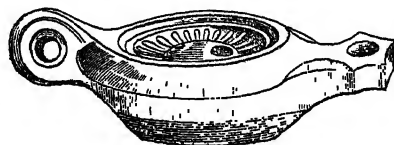


Fig. 1.



Fig. 2.

great artistic beauty of form, does not claim a higher construction than the lamp of many rude nations.¹ It consists of a vessel, open or closed, with a wick rising through a hole in the beak; and as combustion can only take place on the outside of the flame, more carbon is likely to be liberated from the oil than the oxygen in contact with the flame can consume, hence such a lamp is always liable to smoke. In the old kitchen lamp the beak is removed a considerable distance from the reservoir, so as to diminish the shadow cast by the flame, and thus increase its illuminating power. Until the year 1789 (when Ami Argand invented the lamp which continues to bear his name) lamps were dull, smoky, ill-constructed articles, soiling everything around them, and filling the air with a nauseous odour.

The Argand lamp has undergone many improvements since the date of its invention. A common form of this lamp is represented in fig. 3, where A is the reservoir, which is air-tight at top, and has the neck immersed in oil, so that oil flows out of it only when the external air is admitted to ascend through the neck; it contains a short column of liquid, from the top of which the pressure of the atmosphere is excluded, and therefore the column is

sustained by the weight of the atmosphere pressing on its base, on the same principle as a bird-cage fountain. Oil is introduced into the reservoir A by taking it off and holding it with the neck uppermost. The sliding tube

Lamp.

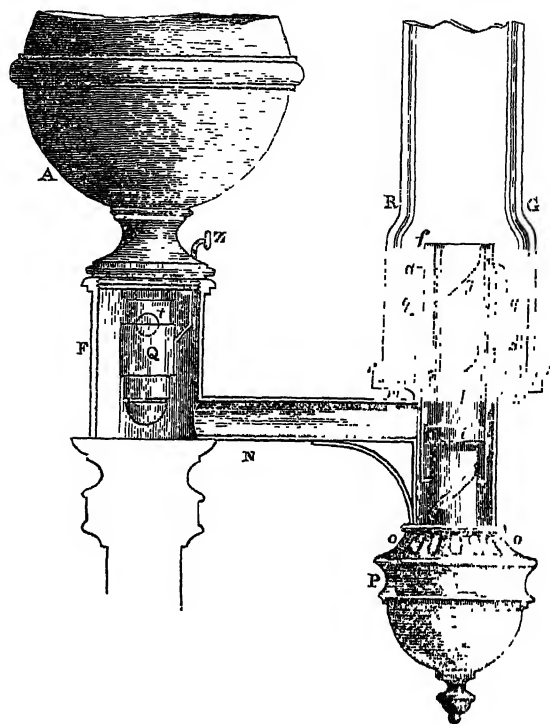


Fig. 3.

Q is pushed so as to cover the hole *t*, and the oil is poured in by a hole at the bottom, which at other times is closed by a screw-nut; when this is done, the reservoir A is replaced in F, and secured by screwing it round. When the lamp is to be lighted, the hole *t* is opened by depressing the sliding tube by its handle Z, and the oil will flow out of A till it rise in F, and in the annular cavity that contains the wick, to the level of the top of the hole *t*. When the oil in F is lowered by the burning of the lamp, so that the surface of the oil in F is below the upper part of the hole, then a bubble of air ascends into A, and a similar quantity of oil descends into F, till the surface of the oil rises again to cover the upper part of the hole. It sometimes happens that the air in A is heated by the warmth of the room, and then too great a quantity of oil descends into F, in consequence of the expansion of the hot air in the upper part of A, so that the oil not being all consumed in the wick, falls down through the tube *g*, and may even run over from the cup P. This is an inconvenience attending the use of oil reservoirs of this construction. When the lamp is not burning, the hole *t* is closed by drawing up the sliding tube Q; the lamp may then be inclined, without making the oil descend from the reservoir. The cylindrical part, where the flame is produced, is composed of three tubes *d*, *f*, *g*. The tube *g* is soldered to the bottom of the tube *d*, just above *o*, and the interval between the outer surface of the tube *g* and the inner surface of the tube *d*, is an annular cylindrical cavity closed at bottom, containing the cylindrical cotton wick immersed in oil. The wick is fixed to the wick tube *ki*, which is capable of being moved spirally; within the annular cavity is also the tube *f*, which is capable of being moved round, and serves to elevate and depress the wick. P is a cup that screws on the bottom of the tube *d*, and serves to receive the superfluous oil that drops down from the wick

¹ These figures are copied from the originals in the British Museum.

Lamp. along the inner surface of the tube *g*. The air enters through the holes *o, o*, and passes up through the tube *g* to maintain the combustion in the interior of the circular flame. The air which maintains the combustion on the exterior part of the wick enters through the holes *m*, with which *m* is perforated. When the air in the chimney is rarefied by the heat of the flame, the column of the atmosphere, of which the chimney is the base, becomes lighter than the surrounding columns; and the surrounding columns, pressing with their excess of weight, enter the lower part of the chimney, and pass upward, with a rapid current, to restore the equilibrium between the adjacent columns of the atmosphere.

In some lamps, above the orifice of the tube *g*, and nearly at the height of the top of the flame, there is placed a circular plate of metal, of the same diameter as the tube: this has the effect of turning the current of air into that part of the flame where smoke would otherwise be produced. The same effect is obtained by the contraction of the cylindrical glass chimney at R G. See GAS-LIGHT. The oil flows from the reservoir A and F through N, and occupies the cavity between the exterior surface of the tube *g*, and the inner surface of the tube *d*. The oil rises in the annular cylindrical cavity between these two tubes to the level of the opening *t*. The part *hi* is a short tube, which receives the circular wick, and slides freely on the tube *g*. The tube *g* has a hollow spiral groove on its exterior surface, into which enters a pin connected with the wick-tube *hi*. The wick-tube has also a catch, which works in a perpendicular slit in the tube *f*; and, by turning the tube *f*, the wick-tube will be raised or lowered, for which purpose a ring, or stage, *m*, fits on the tube *d*, and receives the glass chimney R G; a wire S is attached to the tube *f*, and is bent over the edge of the tube *d*, and descends along the outside thereof. The part *m*, that supports the glass chimney, is connected, by four other wires, with the ring *q*, which surrounds the tube *d*, and is capable of being moved round. When *m* is turned round, it carries round along with it the ring *q*, the wire S, and the tube *f*, and thereby produces the elevation and depression of the wick.

In the most simple construction of Argand lamps, the surface of oil in the oil-reservoir is nearly on a level with the flame, because the capillary attraction of the wick can only raise the oil a little above the surface of the reservoir. The surface of the reservoir also is considerable, that the lamp may burn for a sufficient length of time before it has consumed so much oil as to reduce the level of the oil below the reach of the action of the capillary attraction of the wick. Mechanists have contrived lamps of various forms, with the view of removing the inconvenience of the shadow of the reservoir, which cannot be got rid of in the common lamp with one lateral beak.

In what is called the *Astral* lamp, the oil vessel is of a flat annular shape, so that a tolerably large supply of oil may occupy only a small depth. The vessel surrounds the burner at the distance of a few inches, and is supported by two curved tubes, one of which conveys the oil to the wick. The shadow of this oil vessel, though small, is cast all around, and the two supporting tubes also cast their shadows on the table, but when the lamp is hung from the ceiling, the shadow of the oil-vessel may fall so as not to be inconvenient. In the *Sinumbra* lamp (*sine umbra*, or without shadow), the shadow is greatly reduced by making the circular oil-vessel in such a way that its three surfaces meet in the form of a flat wedge, the sharp edge being directed towards the flame. The position of the flame, with respect to the oil-vessel, is such that two tangents drawn from the apex and base of the flame *oo* (fig. 4), meet a few inches behind it in a point, beyond which there is no shadow; and even within the space of the shadow the ground-glass shade which rests upon the oil-vessel, breaks

up the shadow by its diffusion of the light: *f* represents the inner cylinder, with the spiral groove for raising the wick. Lamp.

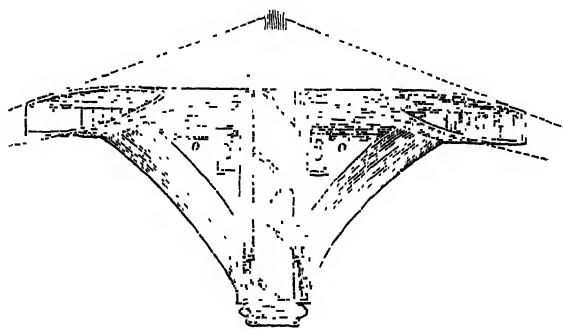


Fig. 4.

In order to get rid of the shadow, lamps have been constructed in which the oil-vessel is placed in the foot or pedestal, and the oil is raised to the wick by various ingenious contrivances. In *Girard's* lamp the oil is raised by

the compression of air somewhat after the manner of water in a fire-engine, or as in Hero's fountain, where the pressure exerted in one vessel is transferred to another distant vessel by means of the compressed air. In *Keir's Hydrostatic* lamp, the oil is raised and supported by a column of salt and water, sufficiently dense to support a column of oil $\frac{4}{5}$ ds of its own height. Instead of the solution of salt, other heavy liquids, such as syrup, honey, mercury, or a solution of sulphate of zinc may be used. The zinc solution is 1.57 times denser than oil, hence a column 10 inches high, will support a column of oil 15.7 inches high. The zinc column is fed from a reservoir, so as to maintain the oil at the proper level. Such lamps are subject to the great inconvenience of not being portable; indeed a very slight motion causes the fluids to oscillate and extinguish the flame. The principle of such lamps will be better understood by the following description of Mr Barton's lamp, in which T (fig. 5) is the oil-reservoir, from which the oil passes upwards to the wicks *a, a, a*. The oil-reservoir is open at bottom, at *h*. This is preferable to the mode of making the reservoir with a perforated bottom that screws off for the purpose of cleaning it. The fluid B, in which the oil-reservoir is immersed, is a solution of salt in water. This liquid is contained in a vessel RMO, which can be unscrewed at O, for the purpose of taking out the oil-vessel. N and Y are two floats fixed to the oil-reservoir and its tube. The column of the solution of salt, *ch*, presses against the oil at the open bottom of the reservoir, and maintains a column of oil in the tube to the height *e*; to this point *e* the wick descends, and raises the oil to the flame by the capillary attraction of its fibres. The specific gravities of the oil and the solution of salt

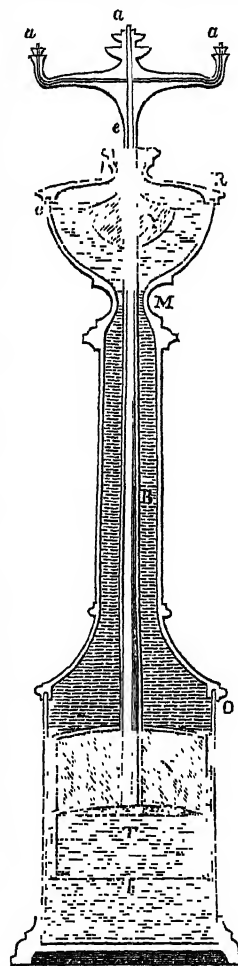


Fig. 5.

Lamp.

must be inversely as the heights ch and he ; that is, the specific gravity of the solution of salt must be made to bear to the specific gravity of the oil the same proportion that the perpendicular height eh , bears to the perpendicular height ch . As the oil is consumed, the salt water enters the hole at the bottom of the oil-vessel; the surface of the water at c sinks, and the oil-reservoir, with the tube and wicks attached to it, sink also. The upper part of the vessel R should be of a capacity a little less than the capacity of the oil-reservoir, so that, when the water has displaced the oil, and filled the oil-reservoir, the float Y may be at the bottom of the enlarged part of the water-vessel R . To prepare the lamp, the exterior vessel is filled with the solution of salt by the opening at l ; the solution passes into the oil-vessel by the open bottom h , and the oil-vessel rests on the bottom of the exterior vessel. The oil is then poured in through the tube e . The oil passes into the oil-reservoir, expels the water, and floats the oil-reservoir, raising the surface of the water in R .

Attempts have been made to get rid of the leading objection to hydrostatic lamps by placing a pumping apparatus in the oil reservoir in the pedestal, but as the pump has to be worked occasionally by hand, this is an objection. In *Carcel's Clock-work or Mechanical Lamp*, the oil is raised by clock-work in such quantity as to exceed that consumed during the time of burning, the excess constantly flowing back into the reservoir over the outside of the burner, thereby keeping the metal work cool, and thus preventing the formation of carbon on the outside of the burner: the wick must be raised higher than in ordinary lamps. Modifications of this lamp have been introduced, in which the clockwork is replaced by a descending weight, such as a piston in a cylinder, or by causing a spring to act upon a piston. In such examples it has been found difficult to regulate the supply of oil to the wick. In *Meyer's Elliptic Lamp*, a leathern piston or valve is worked by a rack and pinion, the oil being contained in a cylindrical vessel in the foot. So long as the piston is above the bottom of the oil-vessel, it is pressed by a spiral spring, attached to the top of the lamp; between the coils of this spring, and passing air-tight through the piston, is a tube, terminating in a funnel-shaped mouth in the oil-vessel, and covered with a perforated dish for straining the oil. The oil is pressed up this tube to the burner, near which is a fine silver tube, surrounded by a cup of wire gauze, of tinned copper, for straining the oil from solid particles. This tube, which is only $\frac{3}{8}$ th inch in internal diameter, regulates the flow of the oil, and its length and bore are so proportioned to the force of the spring, as to bring up enough oil to feed the flame, together with a surplus quantity which overflows, and keeps the metal parts of the wick cool. The lamp is supplied with oil at a point above the spiral spring, and flowing down, it occupies a position above the piston. By winding up the rack-work with a key, the piston is lifted to the top of the oil-vessel; the ascension tube, with the burner attached, is next pushed down through the piston, whereby the oil occupies a position below the piston, which is forced down by the spring, and thus raises the oil. Such a lamp will yield a good light for eight or ten hours, and will allow of the combustion of crude vegetable oils.

In *Parker's Economic or Hot-oil Lamp*, the oil-vessel is situated above the flame, for the double purpose of throwing the shadow in an unobjectionable direction, and also for overcoming the consistency of crude whale oil, which requires to be made fluid by heat before it can be burned in common lamps. Fig 6 illustrates the construction of this lamp. R is the oil-vessel, consisting of a double cylinder of metal, surrounding the upper part of the chimney M , from which the oil descends by the arm A , to the burner. This arm has at its lower part a slide-valve D , worked by a trigger TC , on raising which the supply of oil can be cut off, and

the oil-vessel removed for filling. The valve allows the oil to be introduced, care being taken to fill the reservoir completely, since any air left in it would expand by heat, and cause the oil to overflow. The glass chimney G rests on three points, which can be raised or lowered by a rack and pinion, by which means the flame is regulated, not by the motion of the wick, as in ordinary lamps.

The facility with which volatile oils are decomposed and give off their carbon, renders them in general unfit for burning in lamps, but where such oils are plentiful, they may be brought into use by being mixed with other substances, which diminish the percentage of carbon. Thus, in some parts of Germany, oil of turpentine is mixed with strong spirit of wine; such a mixture is burnt in a lamp of peculiar construction, consisting of a large oval reservoir, into which the burner fits tightly, and descends nearly to the bottom. The burner consists of a wide metal tube passing down another tube, which surrounds a loose cotton wick. At the top of the burner tube is a narrower tube, terminating in a knob, and just below the knob is a ring of small holes. A small cup surrounds the burner-tube, in which a small quantity of spirit of wine is burnt preparatory to using the lamp, and the heat thus excited causes a portion of the spirit mixture to issue from the ring of holes, in the form of an inflammable vapour, which being ignited, a crown of flames is formed, surrounding the metal knob, the heat of which continues the vaporization, and the lamp burns in this way without requiring further attention. The light thus produced is brilliant, but expensive. Lamps have been prepared in Great Britain for burning various preparations of hydro-carbon, alcohol, pyroxylic spirit, &c. Lamps without wicks have been formed for the combustion of naphtha, resembling in principle the German lamp above described. Camphine has also been much in request. This substance is prepared by distilling oil of turpentine over chloride of calcium, so as to get rid of water; it then contains 88.46 per cent. of carbon, the remainder being hydrogen, so that it is a powerful illuminating body. From the readiness, however, with which it is decomposed, considerable care is required in adjusting the supply of air; if there be not sufficient oxygen, large flakes of unconsumed soot escape into the room, and unless the camphine be carefully prepared, it is apt to give off an odour which produces headache. Under proper management, the camphine lamp yields a white and brilliant light.

During the late war, the managing directors of Price's Patent Candle Company contrived a kind of lamp stove, which they call the *Crimean Army Stove or Camp Lantern*, and which was adapted for baking, for boiling, and for warming a tent. Its dimensions are 17 inches in height, 19 inches across the handles, and 15 inches from back to front, the weight being about 30 lb. It consists of a square sheet-iron box, with a door and latch, a cover for the same, a baking pan, with a cover, two lamps, each with six wicks, trimmed with cocoa-nut oil, and there is also a loose grating. The directions are as follows:—*For baking*: Let the baking pan, with cover, rest upon the top ledges, put the cover on the stove, then place the two lamps upon the bottom grating, light the 12 wicks, and shut the door; in less than half an hour the stove will be at a proper baking heat. *N.B.*—By covering the top of the stove with a coat, blanket, or sack, you will get up the

Lamp.

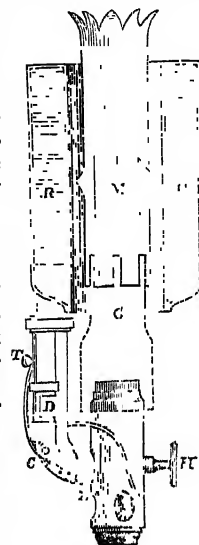


Fig. 6.

Lamp
Black
||
Lampe-
dusa.

heat sooner, and bake more rapidly; be careful that the baking pan has on its own cover, as well as that belonging to the stove. *For boiling*: Remove the baking pan, and let the loose grating to carry the sauce-pan rest upon the middle shelf; on the bottom grating place one or both of the lamps, according to the rapidity with which you want to boil. *For warming a tent*: Remove the baking pan,

and upon the bottom grating place one of the lamps, then put the cover on the stove.

Lamps for special purposes are described in other parts of this work, such as the *Miner's Safety Lamp*, under COAL; the *Lighthouse Lamp*, under LIGHTHOUSE; the *Furnace Lamp*, as used by the scientific chemist; the *Spirit Lamp*; the *Locatelli Lamp*, and some others. (C. T.)

Lampeter
||
Lanark.

LAMP-BLACK, a variety of carbon or charcoal in a state of minute division, prepared chiefly from the impure resin and other refuse left after the distillation of turpentine. These secondary products are burnt in iron pots, or in a furnace, with a supply of air inadequate to their complete combustion, and the dense smoke thus produced is passed into chambers lined with sheep skin, or with sacking, upon which the soot or lamp-black forms a deposit. It is swept off from time to time, and sold without any further preparation. In this state, however, it contains salts of ammonia, and certain resinous and bituminous matters, all of which may be driven off by heating the crude lamp-black to redness in a close vessel. Thus purified, the lamp-black is almost entirely pure carbon, and when heated in the air it will burn away with scarcely any residue. Lamp-black was formerly prepared by burning lamps fed with crude refuse oils, in a close chamber, and collecting the soot from the smoky flames in the manner above mentioned, whence the origin of the name lamp-black. The theory of its formation is simple: if a compound of hydrogen and carbon be raised to a temperature sufficient to convert it into an inflammable vapour, and enough oxygen be introduced to combine with the hydrogen only, water will be formed, and the carbon be deposited.

The chief demand for lamp-black is in the manufacture of black paint and printer's ink, for which it is often prepared by burning coal-tar. A coarse lamp-black, used in paying ships, &c., is also prepared from some kinds of coal. (C. T.)

LAMPADEPHORIA, *i.e.*, the *torch-bearing*, or the *torch-race*, an Athenian ceremony at the festivals of the fire-gods Prometheus, Vulcan, and Minerva, in which the runners carried lighted torches, sheltered by shields, from the joint altar of these gods in the outer Ceramicus to the Acropolis. After the battle of Marathon, it was introduced into the festivals of Pan; and in the time of Socrates, into those of Artemis, on which occasion horses were first used. The art seems to have consisted in carrying a lighted torch from the starting-place to the goal without letting it go out. Several chains of runners were stationed along the race-course, which was about half a mile in length. The first runner in each chain passed the lamp to the second, he in his turn to the third, and so on. That chain which was the first to pass the still burning torch to its destination was declared victorious. The ceremony was most probably intended to symbolize the theft of the fire from the chariot of the sun by Prometheus, and to commemorate the benefits which have accrued to mankind from his crime.

LAMPEDUSA (the ancient *Pelagia* or *Lopadusa*), an island in the Mediterranean, belonging to the kingdom of the Two Sicilies, and lying midway between Malta and the Tunis coast, in N. Lat. 35. 29. 12., E. Long. 12. 35. 12. It is 7 miles in length from E. to W., by scarcely 1 in breadth. The interior is level, and abounds in dwarf olives and other similar shrubs, which are cut down and exported to Malta and Tripoli for firewood. But the shore is high and precipitous, except on the S.E. side, where it is low, and indented by a number of small bays. Wild goats are found in great flocks; and caves are numerous both on the sea-shore and in the interior. This island was made a state prison by the king of Naples in 1843. As dependencies, it has the islands Lampione and Linosa.

LAMPETER, a market-town and parliamentary borough of Wales, in Cardiganshire, near the Teify, 29 miles E. by N. from Cardigan. The college of St David's, a handsome quadrangular building, founded in 1822 by Bishop Burgess, is intended for theological students who could not bear the expense of attending Oxford or Cambridge. It accommodates about seventy students, and has an annual income of L.3000. Pop. (1851) 907.

LAMPRIIDIUS, *ÆLIUS*, one of the writers of the *Augustan History*, who lived at the beginning of the fourth century, during the reigns of Diocletian and Constantius, to whom he dedicates his work. The *Augustan History* is composed by six different authors, and contains a series of biographical sketches of the Roman emperors, from Hadrian to Carus and his sons (117–285, A.D.) These authors were *Ælius* Spartianus, *Vulcatius* Gallicanus, *Trebellius* Pollio, *Flavius* Vopiscus, *Ælius* Lampridius, and *Julius* Capitolinus. Lampridius wrote the four lives of Commodus, Diadumenus, Heliogabalus, and Alexander Severus. He seems to have been more attentive to the accuracy of his facts than to the beauty of his style. It is supposed by Vossius (*De Hist. Lat.* ii. 7), and by Fabricius (*Biblioth. Lat.* iii. 6), that Lampridius and Spartianus are the same writer; but this opinion has been ably refuted by Demoulines. (See Moller, *Diss. de Æl. Lampridio*, Altorf, 1688; Casaubon, *ad Spart. Adrian.*)

LAMPSACUS, or LAMPSACUM, a celebrated Greek colony of Asia Minor, on the shore of the Hellespont, not far from the spot where the strait begins to widen out into the Propontis. It was colonized by settlers from the Ionian cities of Phocæa and Miletus, but it had already been long in existence under the name of Pityusa. It had an excellent harbour, and soon became a great commercial mart. During the Ionian revolt, it passed into the hands of the Persians, but even during the period of their supremacy it continued to be governed by a native tyrannus. In 479, after the battle of Mycale, it allied itself with Athens, and continued faithful till near the close of that century, when, on the occasion of the Athenian disasters in Sicily, it revolted. The Athenians, however, reduced it again with ease. Like most of the other Greek cities in Asia, it submitted to Alexander the Great. At a later period it opened its gates to the Romans, when they reached it on their way to the conquest of Syria. Under the Romans it long continued to thrive. Lampsacus was the chief seat of the worship of Priapus, who is said to have been born there of Aphrodite. It gave birth to several distinguished men, among whom may be mentioned Anaximenes the orator, Metrodorus the Epicurean philosopher, and Charon the historian. A small village called Lamsaki stands near the site of the ancient town, of which not a trace is now to be seen.

LANARK, a royal and parliamentary burgh of Scotland, capital of Lanarkshire, is situated on an eminence near the N. bank of the Clyde, 25 miles S.E. from Glasgow. The town, declining and deserted at the beginning of this century, has been revived since the introduction of hand-loom weaving among the inhabitants, the majority of whom are employed by the Glasgow cotton manufacturers. Lanark joins with Airdrie, Linlithgow, Hamilton, and Falkirk, in returning a member to Parliament. From a very early

Lanark,
New
||
Lanark-
shire.

date it was a place of importance. Here Kenneth held a council in 978; Wallace killed Heselrig in 1297; and the Covenanters issued their proclamation in 1682. The remains of two Roman camps are distinctly traced in the neighbourhood. Pop. 5008.

LANARK, *New*, a manufacturing village, is situated on the N. bank of the Clyde, about a mile from the town of Lanark. It was founded by David Dale in 1783, and was afterwards improved by his son-in-law, Robert Owen the socialist, who tried to introduce his scheme of communist life into the manufactory. The inhabitants are exclusively engaged in cotton-spinning. Pop. about 1600.

LANARKSHIRE, or CLYDESDALE, is one of the largest, most populous, and most important of the counties of Scotland. It is situated between N. Lat. 55. 18. and 55. 56., and W. Long. 3. 24. and 4. 23. It is bounded N. by the counties of Dumbarton and Stirling, S. by Dumfriesshire, E. by the counties of Edinburgh, Linlithgow, and Peebles, and W. by those of Ayr and Renfrew. Its extreme length from S.E. to N.W. is about 54 miles, its greatest breadth from E. to W. being 33. It contains an area of about 986 square miles, or about 631,719 imperial acres. In early times Lanarkshire formed a portion of the Roman province of Valentia, and afterwards of the British kingdom of Strathclyde. A part of the neighbouring county of Renfrew was formerly included in this district, but during the reign of Robert III. it was disjoined, and formed into a separate jurisdiction in favour of his eldest son James. At that time Lanark was divided into two wards, the *over* and *nether*; the burgh of Lanark being the chief town and seat of justice of the former, and the burgh of Rutherglen of the latter. These divisions continued till the last century, when they were formed into three wards, and this division exists even to the present day. The *upper*, of which Lanark is the chief town, and which contains about two-thirds of the whole area of the county, is, on the E., S., and S.W., chiefly mountainous; the *middle*, which has the town of Hamilton in the centre, stretches along the W., and N.; and the *lower* contains the city of Glasgow, and a small tract around it.

This extensive district presents great variety of surface. In its upper, or southern portion, it is hilly and mountainous, the principal mountains being the lofty Lowthers, which, on an average, rise to 2450 feet above the level of the sea, the highest peak being 3100 feet. The heights of the other mountains are—Culterfell, 2454; Tintock, 2317; and Cairntable, 1944. Leadhills, a village on the southern extremity of the county, is, at its S.W. end, 1323 feet above the level of the sea, being the highest inhabited ground in Scotland. In proceeding along the banks of the Clyde, N. from Tintock, the face of the country softens down to gentle elevations and depressions, and for 12 miles the river winds slowly through fertile *haughs*. The middle ward is much less elevated, few of the heights being much more than 700 feet above sea-level, the town of Hamilton being only about 80; yet there are no plains of any extent, except along the banks of the Clyde, and a considerable part of the surface is covered with moss, in many places to a great depth. Of the lower ward, the greater portion is a well inhabited district, particularly the banks of the Clyde, which are thickly planted with villas and villages, dependent on, or connected with, the city of Glasgow.

The principal river, being the third in size, but, in a commercial point of view, the greatest in Scotland, is the Clyde, from which the county is frequently called Clydesdale. It has its rise among the wastes of the mountains which separate Lanarkshire from Dumfriesshire, about 1400 feet above the level of the sea, and near to the sources of the Tweed and Annan. Issuing from its almost imperceptible source, about the head of the Dear Water, it flows

onward in a N.W. direction, and after receiving several streamlets, assumes the name of the Clyde. Passing through a lonely and pastoral country, and thereafter skirting the ruined castle and little village of Crawford, it gradually increases in size until it reaches Bonniton, the first of the famous Falls of the Clyde. Here the banks slope gently downwards, and are ornamented with lofty trees and leafy brushwood. Before reaching the fall the channel has become broad, and the course of the river uninterrupted and tranquil, but here the stream tumbles over a height of 27 feet, and descends into a glen in a broad and unbroken sheet. From this point the banks become precipitous, and are beautified with wood. The bed of the river becomes rugged, and its waters roll turbulently along, until they reach the magnificent fall of Corra, where they at once dash over a precipice of 85 feet in height, falling into the deep abyss of the *linn*. The scenery in the neighbourhood of this cataract is of the boldest and most romantic description. Hurrying on through a deep ravine, the river reaches a third but smaller fall, called Dundaff Linn, and passing a singular piece of rock called Wallace's Chair, where it is said the Scottish patriot once found a temporary concealment, and skirting New Lanark, with its extensive cotton-mills, and passing the county town of Lanark, it at length receives the waters of the Mouse, which, dashing and foaming from the split rocks of Cartland Crag, adds to the volume of the stream, and contributes, at the precipice of Stonebyres, to form the fourth, and perhaps the most striking fall of the Clyde. Near to the junction of the Nethan with the Clyde are the ruins of Draffin or Craignethan Castle, generally considered as the Tillietudlem of Sir Walter Scott. In this castle the beautiful and unfortunate Mary Queen of Scots, found a temporary asylum, after her escape from Lochleven Castle. The Clyde, having again received the Avon, and having passed the ruins of Cadzow, sweeps through the richly-wooded *haughs* of Hamilton, extending to upwards of 1410 acres, in the centre of which stands the ducal palace of that name, one of the most magnificent and classical edifices in Scotland. Lower down, the Clyde is spanned by the Bridge of Bothwell, celebrated for the deadly conflict which took place in 1679 between the king's troops and the Covenanters, and passes the ruins of Blantyre priory, founded in the thirteenth century, and of Bothwell Castle. At Glasgow its commercial importance commences. There the Clyde becomes navigable for vessels of more than 1000 tons burden, and drawing fully 19 feet water. See GLASGOW.

The soil of Lanarkshire is of great variety, but the moorish and mountainous predominate. The upper ward consists, to a great extent, of moorland and pasture. In the lower valleys of this ward, however, wheat is sometimes grown, but the cereals best adapted for this lofty district are oats and barley. Potatoes are widely cultivated, while of late years turnip husbandry has been much increased. In the middle ward the land under tillage is chiefly from 250 to 300 feet above the level of the sea. It is generally clay, but along the banks of the Clyde and its tributaries there are considerable tracts of an alluvial description. It is in this ward where the orchards of Lanarkshire are placed, which seem to have been a characteristic of this portion of Scotland since the days of the venerable Bede. During the French war, when excluded from the continental supply, the yearly average derived from their fruit was little short of L.8000; but since the increased facilities for continental communication, many of the Lanarkshire orchards have been now as much devoted to the rearing of gooseberry and currant bushes for the Glasgow market as to the cultivation of apples, pears, or plums, which are subjected to foreign competition. The lower ward, particularly along the banks of the Clyde, is a fertile and highly cultivated district. From the vicinity of Glasgow, the farmers are

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here stimulated to the highest efforts of agricultural improvement. Of late years much land has been reclaimed, and draining has been everywhere prosecuted with great vigour, while the plantation of trees in exposed situations has also contributed to ameliorate the climate. As the greatest portion of the county slopes towards the W., the breezes of the Atlantic exert a powerful influence on the climate. For about two-thirds of the year the wind blows from the S.W. and W. Frosts are never of long duration, and long-lying snow is rare. In general the atmosphere is humid, and the harvest, at least in the uplands, is generally late. The range of the thermometer is from 11° to 85° . The mean maximum and minimum at Glasgow for 1851 to 1854 was 47.1 , while the mean quantity of rain that fell each year was 37.22 inches.

From the peculiarity of the soil, and the humidity of the climate, great attention is paid to the rearing of stock, and to the produce of the dairy. The fact is, milk cows and dairy produce are two of the chief objects of attention in the upper ward, and particularly in the parishes of Carnwath and Lesmahagow, where the best cheeses are made, being equal to the first quality of Dunlop. The Ayrshire breed of cattle has hitherto been most prized, but the Lanarkshire newly improved breed, crossed by the Ayrshire cow and short-horned bull, or *vice versa*, has been found superior. The draught horses of this county are justly celebrated. They are generally bred in the upper ward, and are supposed to have originated from some Flanders or Holstein horses brought over in the seventeenth century by one of the dukes of Hamilton.

The following are the agricultural statistics of the county in 1856, omitting fractions:—

Number of occupants	2,978		
Total acreage under a rotation crop	209,541		
Wheat	8,973	Acres.	
Barley	1,787		Acres.
Oats	54,803		
Rye	56		
Bere	299		
Beans	4,010		
Pease	317		
Vetches or Tares	1,688		
Turnips	11,443		
Potatoes	8,733		
Mangold	114		
Horses for agricultural purposes above 3 years old	5,765		
Do. do. under 3 years	1,506		
All other horses	1,399		
			8,670
Milk cows	31,309		
Other cattle	20,740		
Calves	9,373		
			61,422
Sheep of all ages, for breeding	89,859		
Do. do. for feeding	20,313		
Lambs	66,817		
			176,989
Swine			6,998
Total stock	254,079		

Irrespective of the city of Glasgow and the burgh of Lanark, there are the burghs of Hamilton, Airdrie, and Rutherglen, with which may be classed the populous villages of Strathaven, Biggar, Blantyre, Bothwell, Wishaw, Coatbridge, Carnwath, Carluke, Douglas, Lesmahagow, Leadhills, New Lanark, Cambuslang, and Stonehouse. The cotton manufactures, the iron-works, and mining give employment to the generality of their inhabitants.

The lakes or lochs within the bounds of Lanarkshire are few and small. Of these are the Bishop's Loch between the parishes of Cadder and Old Monkland, the Black Loch in New Monkland, Johnston Loch in Cadder, Long Loch near Lanark, Cran Loch in the parish of Dunsyre, and

Hogganfield and Frankfield Lochs in the Barony parish of Glasgow. The most extensive sheet of water in the county is the Hill Reservoir, for supplying the Forth and Clyde and Monkland Canals, and which covers an extent of 307 acres.

The geological structure of Lanarkshire is very varied. The central and western districts are occupied by an extensive and rich coalfield, a part of the great carboniferous band traversing Scotland from sea to sea, in a direction from S.W. to N.E. The middle portion of this formation in the Monklands and adjoining parishes is of fresh water origin, and without limestone, but contains the best coal seams, with blackband and other ironstones. Towards the borders on all sides a lower marine series, with encrinal and coralline limestones, crops out. It also contains many valuable coal seams and ironstone, and a few interpolated beds of estuary or fresh water origin. The line of junction between this lower series and the old red sandstone passes across the upper ward, in the vicinity of the Falls of the Clyde, Lanark, and Carstairs. The old red also bounds the fields on the N. and W. in the counties of Dumbarton and Renfrew. The boundaries on the E. and W. are chiefly formed of nearly continuous ranges of trap hills, separating the Lanark fields on the one hand from those of Linlithgow, and on the other hand from those of Ayr. Trap rocks also rise through, and disturb the strata of the interior in many places, and numerous whin dykes intersect the area, affecting generally a N. and S. direction. These, like the other erupted masses, usually alter the strata passed through, converting coal into coke, clay into jasper, and highly indurating the shales and sandstones. In the highest and most southern portion of the county, viz., at Leadhills, there are veins of lead from a few inches to fifteen, and from this silver, to the extent of six to twelve oz. in the ton, has been extracted. Gold also is found among the mountains, imbedded in quartz, or washed down into the sides of rivulets. Gold was first discovered here in the reign of James III., from which a number of coins, known by the name of unicorns, was coined. In the reign of James V. 300 persons were employed searching for this metal, and it is said that gold to the extent of L.100,000 was collected. In 1854, the lead obtained at Leadhills amounted to 216 tons, from which 170 tons of pure lead was obtained. In the valuable paper by Mr Hunt, "On the Mining Industries of the United Kingdom," he states that L.20,000 were expended at Leadhills to obtain less than L.5000 of gold.

It is on the mineral wealth of the county that its prosperity chiefly depends. In 1854 there were 153 collieries, employing 15,580 persons, and 13 ironworks, having 72 furnaces in blast, and 16 out of blast, and employing 3649 iron-miners, and about 1000 men in the management and working of the furnaces. In the manufacture of malleable iron, it may be stated that, up to 1842, the production did not exceed 35,000 tons, whereas in 1854 it reached 122,400, the number of men employed in this branch being about 4000. The amount of yearly wages paid to the persons employed in the iron and coal works throughout Lanarkshire amounted, in 1854, to about L.1,352,400.

While these departments of industry give so much employment to the population of Lanarkshire, the various cotton, flax, silk, and woollen factories within its bounds tend still more to give work and wages to the people. In 1850 there were 85 cotton-spinning factories, having 864,088 spindles, and 18,811 power looms, employing 5013 males and 17,450 females; 8 woollen factories, having 8765 spindles, and employing 115 males and 372 females; one worsted factory, having 96 spindles, and employing 225 males and 78 females; four flax factories, having 21,044 spindles, and employing 321 males and 808 females; and four silk factories, having 24,402 spindles, and employing 85 males and 418 females. The

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grand total being 102 factories, 918,395 spindles, 18,811 power looms, and 24,885 persons employed. These last figures show that those working in factories are 4·7 per cent. of the population of Lanarkshire in 1851. Since 1850 there has been a considerable increase of cotton manufactories within the county, some very extensive new factories having been lately erected, although a few also have unfortunately been consumed by fire. The progress of cotton-spinning may be exemplified from the fact that there were only 44 cotton mills in 1831, having 640,188 spindles.

Lanarkshire is well supplied with roads, canals, and railways. The great road from Glasgow to Carlisle and London intersects the whole county, and in every direction it is traversed by roads in the best state of repair. In addition to the great and increasing navigation of the Clyde, the Forth and Clyde Canal connects it with both friths. The

Monkland Canal brings down the mineral riches of that Lancashire district to Glasgow, and the Ardrossan Canal connects Glasgow with Paisley and Johnston. Nowhere in Scotland are more railways to be found. The Caledonian links it with England and the north; the South-Western with Ayrshire and Dumfries; the Hamilton with Glasgow and that burgh; the Dumbartonshire with the Vale of Leven, Helensburgh, and the Highlands; and the Wishaw and Coltness with the coal and iron fields of Wilsontown and Shotts.

In population, no county in Scotland has increased so rapidly as Lanarkshire. In 1801 it amounted to 146,699; in 1811, to 191,752; in 1821, to 244,387; in 1831, to 316,819; in 1851, to 532,114. The following table gives a *vidimus* of the population at the last and previous census in the three different wards of the county.

Years.	Upper Ward.		Middle Ward.		Lower Ward.				Total.
	Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.	
1851	19,570	20,702	61,411	57,620	176,713	196,098	257,694	274,420	532,114
1841	17,756	19,078	50,451	46,321	143,290	157,203	211,497	222,602	434,099
Increase.....	1814	1624	10,960	11,299	33,423	38,895	46,197	51,818	98,015

From the above table it will be observed that the total increase upon the whole county, including the city of Glasgow, from 1841 to 1851, was no less than 98,015, the increase being particularly observable in the manufacturing and mining districts, the rate of increase over the whole county being nearly 2·25 per cent. on the entire population of the county, and the rate on the city of Glasgow being 23·62 per cent. In the upper ward, the excess of females in 1851 was 1132; in the middle ward, the excess of males over females was 3791; and in the lower ward, the excess of females over males was 19,835; while the excess of females, which chiefly obtains in Glasgow, was, over the whole county, 16,726. From the great increase of mining operations in the middle ward, and of shipbuilding, engineering, and iron-works around Glasgow, attracting thither hosts of workmen, since the last census was taken, the present population (1856) cannot be less than 600,000. As the last Government census only gives the number of houses, and not, as formerly, of distinct dwelling-houses, it is impossible to state the precise number of inhabited houses, as these are understood in Scotland, that is to say, the houses, whether in flats or otherwise occupied, each by a distinct family. As the number of separate occupiers or families was found in 1851 to be 103,106, this figure may be taken as a near approximation to the number of distinct occupied houses within the whole county. In 1841, these amounted to only 81,576.

The county of Lanark returns one M.P., the constituency being in 1856 only 3126. Were the Registration of Voters Act in burghs extended to counties, the constituency would probably be trebled. The city of Glasgow sends two members, with a constituency of (in 1856) 18,168; and the royal burghs of Lanark and Rutherglen, and the towns of Hamilton and Airdrie, have a share in the election of two other members; Lanark, Hamilton, and Airdrie being joined with Linlithgow and Falkirk; while Rutherglen is linked with Kilmarnock, Rensfrew, Dumbarton, and Port-Glasgow. Lanarkshire contains 55 parishes, of which 11 belong to the Presbytery of Lanark, 14 to that of Hamilton, and 21 to that of Glasgow, all in the Synod of Glasgow and Ayr, and 9 to the Presbytery of Biggar, in the Synod of Lothian and Tweeddale. Of clergymen, there are 95 belonging to the Establishment, 60 to the Free Church, 59 to the United Presbyterians, with a fair proportion of Episcopalians, Baptists, Independents,

Roman Catholics, &c. For its judicial management the county has one principal sheriff and six substitutes, the principal and three substitutes being resident in Glasgow, the other three being resident in Lanark, Hamilton, and Airdrie. There are four prisons within the county, viz., at Glasgow, Hamilton, Lanark, and Airdrie. The following is the daily average number of criminal prisoners confined in each of these during the last four years:—

Year.	Lanark.	Hamilton.	Airdrie.	Glasgow.	Total.
1852-53	22	37	19	580	658
1853-54	13	34	30	574	651
1854-55	13	34	34	547	628
1855-56	23	34	33	461	551
	71	139	116	2162	2488

It will be observed from the above table that, in spite of an ever increasing population, there has been for four years past an annual diminution of criminal prisoners within the jails of Lanarkshire.

The valued rent of Lanarkshire in 1674 was L.162,131 Scots, the valued rent in 1855-56, was as follows:—

City of Glasgow, including Railways and Canals,	£1,336,475
County landward portion, do. do.	917,970
Hamilton, Burgh of do. do.	19,682
Airdrie do. do. do.	23,848
Rutherglen do. do. do.	11,581
Lanark do. do. do.	8,043
	£2,317,599
	(J. S.—G.)

LANCASHIRE, a county of England, embracing the larger part of the largest coal-field in Europe, and containing upon its surface the larger share of the most numerous manufacturing population in the world.

It is alike distinguished in a commercial and in a historical sense. As a palatinate it gave sovereigns to the throne, and as the seat of manufactures it is the recipient of a moiety of the commerce of the kingdom. For purposes of trade it is admirably situated, being for nearly 70 miles washed on the W. by the Irish Sea, and having at the extreme S. the port of the Mersey, which gives admittance to the largest vessels. The figure of the county is extremely irregular. Including the large indentations of the estuaries of the Mersey

Lancashire. and the Ribble, and the Bay of Morecambe, in the county, the western part presents a tolerably straight line, and the outline of the whole county is estimated at 342 miles, the area being 1765 square miles, or 1,129,600 acres, hardly more than 900,000 of which are available for purposes of agriculture.

Rivers. The county is well watered, although the only port of magnitude is that on the Mersey. Those of Preston, Fleetwood, and Lancaster are neither large nor much frequented. The principal rivers are, the Mersey, the Ribble, the Irwell, the Douglas, the Wyer, the Ken, the Leven, the Duddon, and the Lune. The smaller streams are numerous, but more remarkable for rendering the scenery picturesque than for any commercial or manufacturing purpose. The Mersey rises in the hills of Yorkshire, passes by the town of Stockport, enters the Irish Sea at Liverpool, and separates Cheshire from Lancashire. It is navigable up to Warrington, but is merely so far an inlet of the sea. At Flixton it receives the Irwell, which originates in the moors of Yorkshire, and passes by Bolton and Manchester. The Ribble intersects the whole county, and is received into a large arm of the sea a little below Preston. It is navigable to very near that town. The Douglas has its source in the hills around the Rivington Pike, passes by Wigan, and, after receiving some smaller brooks, empties itself into the estuary of the Ribble. The largest river in the N. of the county is the Lune, which, flowing from the hills of Westmorland, enters Kirby Lonsdale, is augmented by the Greta and the Wenning, and after pursuing a south-westerly course, becomes navigable 2 miles below Lancaster. The Wyer rises in the moors between Lancashire and Yorkshire, and flows into the Wyer Water near Poulton.

Mountains. The only piece of water approaching the dimensions of a lake is at Conistone, situated near Furness, parallel to Windermere Lake, a large portion of which is also in Lancashire. The principal hills in this county are the "Fells." The highest is Conistone Fell, in Furness, a part of which is called "Grey Friar," or "Old Man," and is stated to be 2577 feet above the level of the sea. Pendle Hill, above Clitheroe, is 1803 feet; Bleasdale Forest, 1709 feet; and Rivington Pike, 1545 feet high. The other hills are Caton Moor, Woolfell Crag, Padiham Heights, Longridge Fell, Go Hill, Bollinga Hill, Whittle Hills, Cubbear Hill, Hamilton Hill, Cartmell Fells, Wharton Crag, Gargrath Fell, and Blackstone Edge, which separates Yorkshire from Lancashire. The greater portion of these hills are comparatively barren.

Mosses. As the greater portion of Southern Lancashire lies low, the progress of cultivation was in several places interrupted by mosses, bearing a close resemblance to the bogs of Ireland. Many of these have been drained, and the process is still going on. The largest mosses were Chat, Pilling, Trafford, Risley, Ashton, Road, Bickerstaff, Rainford, Marton, St Michael's, Catforth, and Hough. Many of these have almost ceased to exist, and even Chat Moss, the largest, is now being rapidly encroached upon by agricultural enterprise. Some of these mosses, from time to time, have exhibited the phenomenon known in Ireland by the term "moving bog." In 1633, Hough Moss moved from its ancient site, and did considerable damage. In the same century, Chat Moss presented a similar eruption. In 1744 Pilling Moss rose to a surprising height, passed to the adjoining ground, covering nearly 100 acres of land, just as in 1771, Solway Moss, in Scotland, floated away upon the lower lands. Pilling Moss has since been reclaimed.

Forests. Anciently there were several forests, principally at Myerscough, Fullwood, Bleasdale, Wyersdale, and Quernmoor, situate in the northern part of the county, and these belonged to the duchy of Lancaster. The forests have now all disappeared, but the land appertains to the crown, and contributes to the income of the duchy.

The soil is very unequal, and the progress of agriculture, until very recently, was remarkably slow. An agricultural society has existed for about two-thirds of a century, but it is only now that landowners are encouraging their tenants to drain and adopt a scientific system of a rotation of crops. In general the farms are small, and the overflow of opulent people on the environs of towns renders husbandry more fanciful than profitable. The demands for villa property drive back the farmers, and leave only a moderate quantity available for market-gardening. The climate, too, is humid in consequence of the proximity of the sea and the obstructive high lands which rise in the N. of the county. The rain fall is heavy; in mountain districts, according to Mr Miller, the fall of rain increases in quantity from the valley upwards; but the greatest rain fall is found at an elevation of 1000 feet. In the district of Rivington Pike, Mr Hawksly has found, at elevations varying from 430 feet to 1800 feet, the fall of rain to be 56½ inches, and the quantity flowing off the ground 44 inches, leaving 12½ inches for evaporation and absorption. On the lower ground the fall varies from 30 to 40 inches.

Archæology has recently dug evidence out of tumuli a tolerable British civilization prior to the arrival of the Romans. According to such dubious proofs as the records afford, the S. of Lancashire was inhabited by a people who bore the name of *Setantii* or *Segantii*, interpreted to mean "dwellers in the country of water," and their capital, it is alleged, stood on the Ribble. The northern part of the county, in common with Yorkshire and Cumberland, was peopled by the Brigantes, and their name occurs most frequently in the Roman annals, because with them most of their wars were waged. Recent writers contend that the Gauls and the Saxons were for centuries confined to the E. of England, and that the people of the N. were derived from Scandinavia. The dialect, not yet extinct, of certain parts of the county, would seem to give some slight support to this opinion: thus a scythe is called a *liar*, the pure Icelandic word for that instrument.

The Romans established stations at Manchester (*Man-cunium*), Warrington (*Veratinum*), Ribchester (*Rerigonium*), Colne (*Culunium*), Blackrode (*Coccium*), Lancaster (*Ad Alaanam*), and Overborough (*Bremetoniacum*). These they connected by a network of roads, some five feet wide, and others much wider. They diverged from Blackroad, and embraced all the southern stations then running directly to Chester and York. Four of these roads still remain—two from N. to S., and two from E. to W. During their dominion in Britain, Lancashire and Yorkshire were called *Maxima Cæsariensis*, or *Britannia Superior*. Under the domination of the heptarchy Lancashire formed part of the kingdom of Northumberland. This arrangement existed from 547 to 926. After the introduction of Christianity, the churches became numerous in Lancashire, as in the other Saxon provinces; and near to each church was erected a castle. Twelve of these castles,—Walley, Walton, Childwall and Winwick, Blackstone, Tephon, Standish and Penwortham, Wigan, Rochdale, Middleton and Bury, were erected at the S. of the Ribble. In the N., as the religious houses were larger, we may infer more local opulence.

The political divisions of the county resembled those of the Teutonic people everywhere, and probably were like those which prevailed previous to the arrival of the Romans, for that people seldom interfered with the local arrangements of the countries they conquered. Lancashire was divided into six hundreds; the four northern, Lonsdale, Amounderness, Blackburn, and Leyland, constitute the northern division; while the south division consisted of Salford and West Derby.

Previous to the Norman conquest this county was distinguished as an "honour," on which lordships and manors depended. The lands of such honours were granted by

Lancashire. the kings in fee to noblemen, who were bound to keep honour courts; inferior to these courts were manor courts and wapentakes.

The Norman conquest produced a great change. In the Domesday Book, or Census Book, of William the Conqueror, the name of Lancashire does not appear; and the lands between the Mersey and the Ribble were then of so little value, that they are set down at L.120.

The barons of the honour of Lancashire were changed, and Roger de Poitou placed his barons in Liverpool, Widness, Warrington, Newton, Stockport, and in different passages from Rochdale, along the hills of Clitheroe, at Hornby, on the River Wyer, Furness, Penworthan, on the Ribble, and at the various points throughout the county, holding himself the Castle of Lancaster. The land between the Ribble and the Mersey subsequently came into possession of William Earl of Ferrars, who took the title of Earl of Derby, and was made chief lord of the whole county. His successors held the office until 1265, when the then Earl of Derby forfeited his title and his lands, by having taken part with Simon de Montford. Henry III. gave these possessions, with the honour of Lancaster, to his youngest son, Edmund Crouchback, who was created the first Earl of Lancaster. In 1253 this earl was invested with the dominion of Sicily and Apulia, and had the title of King of Sicily. From this incident date some of the most remarkable events in English history. Edmund was enriched by grants and possessions, and in that way was laid the foundation of the greatness which identified, for so many years, the house of Lancaster with the throne. The earls of Lancaster henceforth lived in royal state. Edward III. created Henry Plantagenet the first Duke of Lancaster, and the daughter of the first duke married John of Gaunt, the fourth son of Edward III., who, on the death of his father, was created Duke of Lancaster. His son, Henry IV., decreed by act of parliament, that the revenues and titles should remain to him and his heirs for ever a distinct and separate inheritance of the crown. John of Gaunt, by his great influence and great deeds, succeeded in advancing the county to the dignity of a palatinate. In addition to Chester and Lancaster, Pembroke and Durham were palatinates, but the jurisdiction was taken away by Henry VIII. from Pembroke, and in the reign of George IV. from Cheshire. The Duke of Lancaster had *jura regalia* within the county, subject only to the king's general superiority. He had a court of chancery and a court of common pleas; appointed judges, magistrates, and law officers; pardoned treasons, murders, and felonies; and all writs and judicial proceedings were issued in his name, the king's writs being of no force within the county. Henry VIII., however, greatly diminished these privileges. He took away the power of appointing judges and magistrates, and denied to the duke the privilege of pardoning felons, ordering that all writs should run in the king's name, but to be witnessed in the name of the duke. When the crown obtained possession of the palatinate, a duchy court was established, in which all questions of revenue and counsel affecting the duchy's possessions were to be heard and decided. The court was originally held in the duchy office in Westminster, but it is now permanently fixed at Lancaster-place, Waterloo Bridge, London. The court, as a court of equity for cases arising within the county, sat at Preston, but its operations were, for a long time, merely nominal. This arose from the fact of the six cursitors in the court at Preston retaining all the costs and fees. Attorneys, therefore, declined to frequent the court, preferring the higher court, where the law was considered to be much better administered. Within the last few years, however, the powers of the court have been considerably enlarged, and a registrar, holding offices in Liverpool and Manchester, enables local solicitors to transact much of their business

within the county. The principal court is still at Preston, Lancashire. but the vice-chancellor attends at every assize in Liverpool to transact the business of his office, which of late has considerably increased. At Lancaster a receiver attends annually to transact the pecuniary business of the duchy. The chancellorship of the duchy is a ministerial office, without ostensible duties attached.

The forest laws existed in the Saxon time, and the chief men of the forests were endowed with extraordinary powers. They continued to be exercised until a comparatively recent period. They fell, however, into disuse, and were ultimately abolished by the wars of the houses of York and Lancaster, but the records of its proceedings are extremely meagre. In 1588 the chancellor's fee was L.288, 16s. 4d., and the sum paid to all the officers in salaries was L.641, 3s. 4d. Some years ago the revenue of the duchy was estimated at L.14,000; the disbursements, L.11,741; remaining in custody of the receiver, L.2258. In 1830 Sir Henry Parnell obtained a select committee to inquire into the civil list. The object was to separate the proper expenses of the crown from other charges mixed up with them; but the result was unproductive of anything more than a nominal alteration. William IV. retained the revenues of the duchies of Lancaster and Cornwall. That of Lancaster is permanently annexed to the crown, but that of Cornwall belongs to the crown only when there is no Prince of Wales. Until recently, no return was ever laid before parliament. The gross income of the duchy of Lancaster enjoyed by the crown in 1843 was L.33,037; but the sum paid to the keeper of Her Majesty's privy purse was only L.13,000; the difference is exhausted in the payment of officers, and in charges paid by the woods and forests. The duchy has considerable possessions out of Lancashire. From the creation of Lancashire into a palatinate the history of the county merges into that of the kingdom; for the wars of the Roses, and the Rebellion of 1745, are of general, rather than of local interest.

From a very early period Lancashire was remarkable Manufacture for the production of cloth. Manchester, in the sixteenth century, was a market for woollen fabrics; around it were settled numerous weavers, and these were supplied with yarn from the midland counties, from Scotland, but particularly from Ireland. In 1650 they were distinguished for their manufacturing industry, and in 1720 Manchester had a reputation for enterprise and wealth. The great impediment, however, was the scarcity of cotton yarn. In 1769, however, Arkwright made known his first discovery; discoveries and improvements followed, and Lancashire may now be said to monopolize the most of the cotton manufacture of the kingdom. Silk manufactures were not introduced before 1819, but is now an extensive trade.

Since 1851 the population has greatly increased, and so has the cotton trade. In the article COTTON all the facts will be found; but the following return of the export of cotton manufactures for the first six months of 1854, 1855, and 1856, will show that the increase continues:—

1854.	Quantity.	Value.
Cotton manufactures.....	862,242,082 yards ...	£12,395,170
Ditto yarns.....	70,908,290 lb. ...	£3,255,036
1855.	Quantity.	Value.
Cotton manufactures.....	964,868,662 yards ...	£12,840,203
Ditto yarns.....	77,653,787 lb. ...	£3,295,770
1856.	Quantity.	Value.
Cotton manufactures.....	1,002,400,985 yards ...	£14,032,602
Ditto yarns.....	84,467,782 lb. ...	£3,643,575

Mr James Heywood in 1838 published a map of the Coal-field. Lancashire coal-field. It commences within 5 miles of Liverpool at Tarbock, and runs to Colne, 45 miles; its greatest width is 30 miles, and the bed forms a figure like the beak of an eagle, the bill towards Liverpool. In the S. it is surrounded by red sandstone, and in the N. by grit-

Lancashire. stone. It keeps at a distance of about 5 miles from the River Mersey, and touches it only at Stockport. The coal-field extends into Cheshire and N. Wales, and is separated only by a brief interval from the coal-field of Yorkshire. Mr Dickinson, inspector of coal mines, enumerates the number of collieries in Lancashire, Cheshire, and North Wales as follows :—

334	are in Lancashire,
28	... Cheshire,
5	... Anglesea,
30	... Flintshire, and
26	... Denbighshire.

Total.....423

“The number,” he says, “of working pits or shafts, exclusive of those used solely for air, is 879, besides 60 additional winnings by levels and inclined planes called ‘day-eyes,’ making a total of 939 separate winnings, whereby coal is now being worked. The pits are of various depths up to 520 yards. Shafts of greater depth are proposed; but at present 520 yards is the greatest depth of any working pit. Deeper coals have been worked by inclined planes from the bottom of shafts, and workings are now going on in this way at about 600 yards below the surface. 679 of the pits are in Lancashire; 50 in Cheshire; and 150 in North Wales. Their average depth is 115 yards; those of Lancashire being 118 yards; Cheshire 123 yards; and North Wales 97 yards. The united depth of the working pits being upwards of 57 miles.

“The number of persons employed in and about the collieries in 1852 amounted to 38,800; of whom 31,950 were employed underground, and 6850 on the surface; viz. :—

	Above ground.	Below ground.	Total employed.
In Lancashire.....	5370	25,530	30,900
... Cheshire.....	560	2,140	2,700
... North Wales.....	920	4,280	5,200
Total.....	6850	31,950	38,800

	Tons.
Quantity raised in Lancashire in 1852.....	8,255,000
... Cheshire	715,000
... North Wales	953,000
Total produce of the district	9,923,000

The consumption of Manchester is estimated at two million tons a year, but it is understood that the cost of carriage forbids coal being brought into that city from a greater distance than 12 miles.

The export of coal from Great Britain in 1855 was 4,568,235 tons, and of this quantity only 331,623 tons were from Lancashire.

Minerals.

A not very old author, West, describes the iron mines at Whitrigs, near Ulverstone, as the greatest in the kingdom, but, with the cessation of wood-fuel, iron ceased to be worked in the county. “In Lancashire,” says Mr Binney, F.G.S., in the *Memoirs of the Literary and Philosophical Society of Manchester*, “many beds of cannel run into blackband, in a similar manner to what often takes place in Scotland. However, it is in the upper coal-field that the most valuable ores occur. Above the four-feet mine at Patricroft, and extending under Chat Moss, is a bed of the carbonate of protoxide of iron, about 2 feet 6 inches in thickness. This was found in sinking the shafts of Messrs Lancaster and Co.’s at Patricroft, not far from the Liverpool and Manchester Railway. On analysis, the ore yielded about 72 per cent. of carbonate of iron, and the gentleman, a medical man, who analysed it, told me that it was pure enough to be used for medicinal purposes. Above the three-quarters mine at Bradford, and over the main limestone at Ardwick, are beds of blackband of 12 and 6 inches, respectively, in thickness, the representatives, beyond all doubt, of the red stone

of the pottery coal-field, as their geological position, and Lancashire. the fossils they contain, are exactly the same. Some of the above beds of ironstone only want thoroughly investigating to make them worthy of attention.

“In the middle coal-field are many argillaceous and blackband ores fully as rich as those wrought in other places, and so situated that they could be calcined together with great advantage. Amongst the former are those of Clifton and St Helens, and doubtless many other places in the same position; and amongst the latter the black stone above the cannel mine at Wigan, and several impure cannels and blackbands in that neighbourhood and about Dixon Fold. Below the four-feet coal at Rendleton a carbonaceous blackband was found in sinking Mr Fitzgerald’s pit, about four feet in thickness.

“The vast deposits of hæmatite found in the N. of Lancashire, in the hundred of Furness, occur in great clefts of the carboniferous limestone. These, no doubt, from their great purity, being but little mixed with foreign matters, had their origin from volcanic sources, on or near the spot where they are now found. Some of them, probably, may have come up through the bottom of the clefts in which they occur; and others, from a short distance, have flowed with water into their present positions.”

The population of the county was, in

1801.....	671,486	1841.....	1,667,054
1821.....	1,052,948	1851.....	2,031,236

Popula-
tion.

In fifty years the increase is 201 per cent. Of the 2,031,236 persons, 1,852,103 reside in towns, thus reducing the rural population to 179,133 persons. Of the entire population, 290,948 were engaged in the manufacture of cotton, 85,732 were domestic servants, 38,798 were occupied in farm labour, and 29,793 were employed in the manufacture of silk.

The population about Manchester is most dense, for within ten miles of the city are the great manufacturing towns of Bolton, Bury, Rochdale, Oldham, Ashton, and Stockport, with a multitude of minor places, all more or less engaged in manufactures.

In 1800 the common roads were much complained of; but nearly fifty years before the people of Liverpool projected the Sankey canal, for the purpose of bringing coal from near St Helens to Liverpool. It was not quite 10 miles long. The Duke of Bridgewater soon after projected his first canal; it was subsequently united to the Staffordshire Canal, or Grand Trunk Navigation, and joined Liverpool to Bristol and Hull. The Leeds and Liverpool Canal was commenced in 1770, and ultimately, by a circuitous route of 130 miles, joins Liverpool and Leeds. In addition to these canals there are the Lancaster Canal, the Manchester Canal, the Manchester and Oldham Canal, the Rochdale Canal, and the Ulverstone Canal.

By railways nearly all canals have been converted into merely auxiliary means of transit. The first railroad on which locomotives were used was opened in 1830, between Liverpool and Manchester. Lancashire is now traversed by a multitude of iron roads; one from S. to N. bisects the county, three cross it, at intervals from each other, and these are connected with each other by twelve union lines.

In a manufacturing and trading population like that of Lancashire pauperism is always considerable, sometimes state-large. Employment is not always constant, and “strikes,” or “turn-outs,” frequently interfere with the resources of the working classes. Comparatively, however, the poor rates press less heavily in this than in the majority of other counties. The cost per head on population in 1801 was 4s. 4d. in Lancashire; in the other counties it ranged from 4s. 8d. to 16s. In 1821 it was 4s. 8d. in Lancashire, and in other counties it was as high as 17s. 6d. In 1841 it was 3s. 6d. in Lancashire, as high as 10s. in Bucks, and the lowest was

Lancaster. 3s. 9d. in Monmouthshire. The cost per head in the principal poor-law unions in England and Wales was 4s. 3½d. in 1854, and 4s. 11½d. in 1855.

Religion and education. Religious zeal exhibited itself ardently after the introduction of Christianity, and wherever there was a castle in Lancashire there was a church. The religious houses, however, were not very numerous, but we find three very distinguished ones: one in Furness, one in Cockersand, and one in Wahaley. Originally the N. of Lancashire appertained to the see of York, but before the Norman invasion it had been annexed to the province of Canterbury and the diocese of Lichfield, and continued so until the sixteenth century. An alteration then took place, and a large portion of South Lancashire was included in the diocese of Chester. In 1835, however, ecclesiastical commissioners were appointed to consider the state of the Established Church, with reference to ecclesiastical duties and revenues. These commissioners recommended the formation of two new sees in the province of York; *videlicet*, one at Manchester, and the other at Ripon. Subsequently they recommended that the deanery of Furness and Cartmel should be added to the diocese of Carlisle, but that the deaneries of Amounderness, Blackburn, Leyland, Manchester, and Warrington, then forming part of the diocese of Chester, should be included in the diocese of Manchester. In 1836, with some slight alteration, this proposition received the sanction of the law. The income of the Bishop of Manchester is not to be less than L.4000, nor more than L.5000 per year.

The Reformation seems to have encountered more opposition in Lancashire than in any other county. The principal Catholic families adhered to their own church, and of course sustained the Catholic population dependent upon them. In the reigns of Elizabeth and Mary, penal laws were intended to apply particularly to this county, and the sufferings they entailed are told with great minuteness by the Catholic historians. In the reign of Charles I., the Lancashire Catholics were ardent loyalists, and they were not less attached to the cause of his sons. The gunpowder plot, however, brought down upon them the vengeance of the law, and their sufferings at that time were most severe. Persecution, however, seldom makes converts, and the largest Catholic population in England is still found in Lancashire, augmented constantly by immigration from Ireland.

The creeds of the people of Lancashire seem to have been affected by other circumstances, for it has been found that dissent is most extensive where manufactures prevail. Thus, at the census in 1851, there belonged to the Established Church in Lancashire 529 places of worship, containing 389,546 sittings; of all other denominations, 1098 places of worship, containing 423,789 sittings. The number present in the Established Church on the Sunday on which the census were taken was 222,810; of Protestant dissenters, 227,634; Roman Catholics, 104,302. The total attendance was 554,746, a little more than one-fourth of the population.

The Scottish Presbyterians had 22 places of worship; Independents, 170; Baptists, 100; Wesleyan Methodists, 521; Calvinistic Methodists, 19. This will indicate, to some extent, the comparative proportion of dissenters.

In 1851 there were 3014 day schools in Lancashire, having 215,847 scholars. The number of Sunday schools was 1524, and the number of scholars, 323,173. (v. J. W.)

LANCASTER, a municipal and parliamentary borough and seaport-town of England, capital of Lancashire, on the left bank of the Lune, about 7 miles from its mouth in Lancaster Bay. The town stands on the slope of a hill, on the summit of which is a fine old castle originally built in the eleventh century, but rebuilt in the reign of Edward III., by John of Gaunt, and now used as the county gaol. The

county courts attached to this building are chiefly of a modern date, and are very commodious. On the north side of the castle stands St Mary's Church, an edifice in the later English style, containing carved stalls, screen, and monuments. Though the town is finely situated, the streets are generally narrow, ill-paved, and inconvenient. The houses are generally well built, the material being obtained from the freestone quarries in the vicinity. Among the public buildings are a town-hall, lunatic asylum, theatre, assembly-rooms, public baths, custom-house, several alms-houses, and a free grammar school. The Lune is here crossed by a handsome stone bridge of five arches. The river is navigable for vessels of 300 tons up to the town. About half a mile N.E. of the town the Lancaster Canal is conducted over the Lune by means of a noble aqueduct erected by Rennie at a cost of L.48,000. The Lancaster and Preston Junction Railway, forming a portion of the great north-western line stretching from London to Carlisle, Glasgow, and Edinburgh, passes through the town. Manufactures of cotton, silk, linen, and sailcloth; cabinet-making and upholstery and ship-building; marble-polishing works and iron foundries are carried on. On 31st December 1855, 88 sailing vessels of 8996 tons, and 9 steamers of 1148 tons, were registered as belonging to the port. During that year 1719 vessels of 127,443 tons entered, and 780 vessels of 78,475 tons left the port in the coasting trade; while 13 vessels of 3709 tons entered, and 8 vessels of 2751 tons left in the colonial and foreign trade. Lancaster is governed by a mayor, 6 aldermen, and 18 councillors; and returns two members to parliament. Pop. of parliamentary borough (1851), 16,168; municipal borough, 14,604.

LANCASTER, a town of the United States of North America, capital of Lancaster county, Pennsylvania, is situated near the right bank of Conestoga Creek, an affluent of the Susquehanna, 70 miles W. of Philadelphia by railway. It is one of the oldest towns of the state, and was capital of Pennsylvania from 1799 to 1812, when the government was transferred to Harrisburg, the present capital. Its streets are regularly laid out, and the houses are substantial and commodious edifices, mostly of brick. The chief public buildings are—the county prison, the new court-house, an elegant edifice in the Grecian style, and Fulton Hall, for public meetings and assemblies. Franklin College, which was founded here in 1787, but afterwards declined, has been recently united with Marshall College of Mercersburg, and a building called Franklin and Marshall College has been erected.

The cotton manufacture is carried on with much success here, as well as that of rifles, carriages, and threshing machines. The population is, for the most part, of German origin. Lancaster is well supplied with churches and schools, and public libraries. It has 16 churches, 5 being Lutheran and German Reformed, 2 Roman Catholic, 2 Presbyterian, 2 Methodist, and the rest belonging to smaller sects. Lancaster was founded in 1730, and incorporated as a city in 1818. Pop. (1840) 8417; (1850) 12,369; (1854) about 14,000.

LANCASTER, a town of the United States of North America, capital of Fairfield county, Ohio, is situated on both sides of the Hocking River, an affluent of the Ohio, 30 miles S.E. of Columbus. It stands in a beautiful and fertile valley, through which the Hocking and Ohio Canal passes. The town is well built, and contains several churches, while it is connected by railway and canal with the principal towns of the district. In the neighbourhood is a natural pyramid of sandstone. Lancaster was founded in 1800. Pop. (1850) 3480; (1854) about 5000.

LANCASTER, Sir JAMES, an English seaman of the Elizabethan era, noted as the commander of the first expedition sent out by the East India Company in 1600–1603; besides accomplishing all that he was sent out to do, he opened

Lancaster
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Lancaster,
Sir James.

Lancaster,
Joseph
||
Landen.

commercial negotiations between his employers and some of the petty princes of Java and Sumatra. During his voyage he learned enough about the north-west passage to feel assured of its practicability. When he reached home he urged the matter so strongly that expeditions were sent out under Weymouth, Hudson, and other experienced navigators. The secret was not destined to be unriddled for two centuries and a half later; but Baffin, one of those who advanced farthest N., gave the name of Lancaster Sound to a strait which has now been found to communicate with the Arctic Ocean. Had the explorers pushed their way through this sound they would have solved the mystery of the north-west passage. Lancaster's services were acknowledged with the title of knighthood. He died in 1620. The history of his discoveries is given in vol. iii. of Hakluyt's *Voyages*, and vol. i. of Purchas' *Pilgrims*.

LANCASTER, *Joseph*, an educational reformer of much note, was the son of a retired private in the Foot Guards, and was born at London in 1778. When a mere lad he opened a school, on the principle of mutual instruction, for poor children, in the wretched purlieus of Southwark. Before he was twenty-three he had more than 300 pupils, who, according to his system, were taught for almost nothing. His pamphlet on the *Amelioration of Education* had an immense success, and brought him under the notice of the Duke of Bedford, and finally of George III., whose encouragement gave a great impulse to the establishment of Lancasterian schools throughout the country. Extending his views, Lancaster set out in 1807 on a tour through the chief towns of England and Scotland. He was a devoted member of the Society of Friends; and the Anglican clergy, finding that he admitted children of every sect into his schools, began to cry out that the church was in danger, and opposed him with all their might. Lancaster was imprudent; his imprudence resulted in his ruin in Great Britain, and in 1818 he set off to try his fortunes in the new world. He was at first well received, but his zeal again outran his judgment, and in 1829 he emigrated to Canada. The Canadian parliament awarded him some small grants, with a view to giving his experiments fair play. Ill luck again attended him, and he was only saved from great distress by some kind friends, who purchased a small annuity for him. Retiring to New York, he died there in very reduced circumstances, October 24, 1838. Lancaster was the author of several small elementary text-books and pamphlets, in which he advocated his views of education. Whatever be the value of Lancaster's system of instruction, it must cheerfully be confessed that his labours gave a powerful stimulus to the education of the lower classes in England, where numerous schools on his plan still exist.

LANCASTER SOUND. See POLAR SEAS.

LANCIANO (the ancient *Aranum*), a town of Naples, province of Abruzzo-Citra, 6 miles from the Adriatic, and 13 miles S.E. from Chieti. Its commerce, though once extensive, is now comparatively small. The chief buildings are, the archbishop's palace, cathedral, and several of the parish churches and convents. It has an ecclesiastical seminary, and some other schools. Pop. 14,250.

LANDAU, a fortified town of Germany, in Rhenish Bavaria, is situated on the Queich, distant 18 miles N.W. from Carlsruhe. Its chief manufactures are, linens, woollens, tobacco, oil, and fire-arms. The houses are well built and commodious, and arranged in regular streets; while the buildings specially noticeable are, an arsenal, some military establishments, a Roman Catholic church, two Protestant churches, and Latin, agricultural, and industrial schools. From the fifteenth century it has been an object of contest in every great European war; and from 1680 to 1815 it was generally held by the French.

LANDEN, JOHN, a distinguished mathematician of the eighteenth century, the English D'Alembert, as he is called

by the French, was born at Peakirk in Northamptonshire in 1719, and died in 1790. The most of his time was spent in the pursuits of active life, but he early showed strong talent for mathematical study, which he eagerly cultivated at his leisure hours. In 1762 he was appointed agent to Earl Fitzwilliam, and held that office till within two years of his death. Beyond these facts nothing is known of his private history, which seems to have been more than usually uneventful. He lived a very retired life, and saw little or nothing of society. When he did mingle in it, his dogmatism and pugnacity caused him to be generally shunned. He first made himself known as a mathematician in 1744, by his essays in the *Ladies' Diary* for that year. Besides his separate works, he communicated to the Royal Society at different times valuable papers on the most difficult parts of mathematical and physical science, all of them distinguished by depth and powerful ingenuity. One of the most memorable of his achievements was a new form of the fluxionary calculus, which he published in 1758, under the title of *Residual Analysis*. The plan proposed, though inelegant and needlessly complex, may be deemed on the whole an improvement on the method of ultimate ratios. To confer more consequence on his innovation, he contrived likewise a set of symbols and applied his algorithm to the solution of different problems; but it never attained any currency, and soon fell into oblivion.

Landen's works, not included in the *Transactions* of the Royal Society, are, a volume of *Mathematical Lucubrations*, 1755; the *Residual Analysis*, 1764; two volumes of *Memoirs*; and some tracts on *Converging Series*.

LANDER, RICHARD, a distinguished African traveller, was born in Cornwall in 1804. He was brought up as a printer, but abandoned that trade to enter the service of Captain Clapperton, whom he accompanied on his second journey to Africa in 1822. This expedition was attended with important results. (See CLAPPERTON.) Returning to England in 1829, Lander submitted to government a plan for exploring the course of the Niger, which was accepted. He solved the great problem of the course of that river, by tracing it down from Yaouri, above Boussa, to its mouth in the Bight of Benin, and returned to England in 1831, after an absence of a year and a half. In the following year he again set out with his brother, with the view of tracing it up to Timbuctoo. The expedition proved a total failure. Richard Lander was killed in an encounter with the natives, and his brother perished from the effects of the climate. (See AFRICA.)

LANDERNEAU, a seaport-town of France, department of Finistère, in the valley of the Landerneau or Elorn, 13 miles N.E. from Brest. The chief articles of its commerce are, linen goods and thread, glazed hats, leather, military equipments, honey, Dutch cheese, wax, corn, and horses. Vessels of 400 tons burthen can enter its harbour, and about 700 are said to visit it yearly. Pop. 5113.

LANDES, *LES (The Heaths)*, a maritime department in the S.W. of France, part of the old province of Gascogne, is bounded on the N. by the department of Gironde, E. by Lot-et-Garonne and Gers, S. by Basses-Pyrénées, and W. by the Bay of Biscay. It extends from N. Lat. 43. 28. to 44. 38., and from E. Long. 0. 7. to 1. 33. W. The Adour, flowing westward, divides it into two unequal portions. The northern abounds in pine-woods, furze, and brushwood. Numerous lagoons lie along the coast, and shifting sands are everywhere in the interior. Of the entire area, consisting of 2,303,400 acres, a sixth is arable, a third under wood, and a half sterile. Buffaloes and wild horses are found in the *Landes*, and ill-favoured sheep are tended by shepherds, who stalk over the sand and prickly shrubs on stilts. The soil is a dull gray sand, and its only crops are a few scattered patches of maize and barley. The southern portion, called Chalosse, is traversed by offsets of the Pyrenees, watered by the af-

Lander
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Landes.

Landgrave fluents of the Adour, and is of considerable fertility, producing corn, wine, and fruit in abundance. The climate of **Landes** is mild, but unhealthy, especially along the coast. Its natural products are, timber, coal, iron-ore, stone, and marble. Rosin, pitch, and tar, glass, porcelain, earthenware, paper, and leather are manufactured. Its principal rivers are the Leyre, Adour, and Gave-de-Pau. It is divided into three arrondissements, Dax, Mont de Marsan, and St Sever; into 28 cantons, and 333 communes. Pop. (1851) 302,196. Mont de Marsan is the chief town.

LANDGRAVE (*land*, earth; and *graff*, a count), a name given to those counts of Germany who claimed to take their rank from a large province or territory. The title was originally given to the four princes of Thuringia, Hesse, Alsace, and Leuchtenberg; but there are other landgraves, who are not princes, but counts of the empire.

LANDON, LÆTITIA ELIZABETH (*Mrs Maclean*), well known for the pleasing, and at one time highly popular poetry, which she wrote under her initials, L. E. L., was born in 1802, at Chelsea, near London. Till her fourteenth year her time was spent almost equally between town and country, but in 1815 she settled, with her father's family, at Brompton. A near neighbour in that suburb was Mr Jerdan, the editor of the *Literary Gazette*. Some small pieces which she submitted to him were inserted in that journal. These were followed by others of a higher strain, and in a short time it became the fashion to admire the verses of L. E. L. Just as she was emerging into popularity, her father died, in very straitened circumstances. The duty of supporting his family fell upon her, and literature, with which she had at first only coquetted, now became the business of her life. Besides occasional pieces in verse, she contributed largely and regularly in prose to the *Literary Gazette*, chiefly critical notices of novels, and books of poetry and travels. Her intimate connection with that journal and its editor seemed to countenance a false and cruel scandal, which gave the most exquisite pain to its victim. In 1821 Miss Landon published her first considerable work, under the title of *The Fate of Adelaide, a Swiss Romantic Tale, and other Poems*. She speedily followed it up with the *Improvisatrice*, the *Troubadour*, the *Golden Violet*, the *Venetian Bracelet*, and a good many other efforts equally long. At the same time, there was hardly a journal of any note in which she did not scatter some of the waifs and strays of her fancy. In 1831, and the six following years, she edited *Fisher's Scrap-Book*, an annual which, under her care, reached a rare standard of excellence as well as popularity. She also found time to write three novels, *Ethel Churchill*, *Francesca Carrara*, and *Romance and Reality*. In 1838 Miss Landon was married to Mr Maclean, governor of Cape Coast Castle. Except in so far as her health was delicate, her married life was a happy and peaceful one. She had long suffered severely from a complication of nervous diseases, and was in the habit of relieving her pain with small doses of prussic acid. One day, October 15, 1839, she was found dead in her room, holding in her hand a phial of her usual medicine. She had accidentally taken an overdose, and death had been instantaneous. The circumstances of the case gave rise to vague and cruel suspicions, now known to have been utterly groundless.

L. E. L.'s poetical works show her to have possessed a rich fancy, a fine vein of sentimental melancholy, and excellent power of expressing romantic emotion. She delighted to choose her subjects from the old romance, and to treat them romantically. This, in probably a greater degree than their poetical quality, was the secret of their success. Had she been in circumstances to concentrate her powers, she might have earned for herself a niche in the English temple of fame; but, like Mrs Hemans, she wasted her strength in a rapid succession of small efforts,

which served their time, and then were forgotten. Had Landsberg she lived she might perhaps have fulfilled the promise of high genius held out by her youthful effusions.

In 1841 Mr Laman Blanchard published the *Life and Literary Remains of L. E. L.* From this work it is evident that her life was in the main a painful one; yet it is also asserted that the melancholy of her verses is in complete contrast to the vivacity and playfulness of her manners in private life.

LANDSBERG, a town of Prussia, province of Brandenburg, and capital of a cognominal circle, situate on the Wartha, 37 miles N.E. from Frankfort. It has a small shipping trade; and its manufactures comprise chiefly woollen and linen cloths, hosiery, leather, and paper. It is fortified, and contains several handsome buildings. Pop. (1849) 12,630.

LANDSEER, JOHN, Associate Engraver of the Royal Academy, was born at Lincoln in 1769. His engravings for Bowyer's *History of England* and other works first brought him into notice, and he gained a considerable reputation from a course of lectures on engraving, delivered before the Royal Institution in 1806. These were afterwards published. After having accepted the appointment of Associate Engraver of the Academy in the hope of being elevated to the full privileges of membership, he found that his hopes were vain, and devoted himself more steadily to literary aims in connection with his profession. Two art periodicals, started under his management, ultimately proved failures, the second being swamped by the *Art-Union Journal*. His *Sabæan Researches* (1823) were published in continuation of lectures on engraved hieroglyphics, delivered at the Royal Institution. In 1834 he published his *Descriptive, Explanatory, and Critical Catalogue of the Earliest Pictures in the National Gallery*, a work full of amusing gossip, although not free from blunders, and certainly destitute of any claim to be regarded as an authority in matters of art criticism. He is perhaps best known as the engraver of *Dogs of Mount St Bernard*, painted by his son, Sir Edwin Landseer. He died in 1852, leaving two sons, Thomas and Charles, besides the painter already mentioned.

LAND'S END (the ancient *Bolerium*), a granite crag, the most westerly point in Cornwall, England; N. Lat. 50. 4., W. Long. 5. 44.; 266 miles S.W. from London. About a mile W. is the lighthouse of Longships, having a fixed light 88 feet above high water.

LANDSHUT, a town of Lower Bavaria, on the Isar, 39 miles N.E. from Munich. The staple of its commerce is corn, cattle, and wool. Besides numerous mills, distilleries, and breweries, it has manufactures of woollen cloth, leather, starch, tobacco, paper, hosiery, cards, copper-ware, and surgical instruments. Though now on the decline, Landshut was once of great importance. The Castle of Trausnitz, on a hill overlooking the town, was for three years the prison of Frederick of Austria, and during the thirteenth century the residence of the dukes of Bavaria. The removal of the University of Ingolstadt thither, in 1800, gave the town a fresh importance; but its withdrawal to Munich, in 1826, hastened its decline. Pop. 9800.

LANFRANC, Archbishop of Canterbury, and one of the most learned men of the eleventh century, was born at Pavia in 1005. His father was one of the chief magistrates of that city, then the capital of Lombardy. After going through the usual course of study at Bologna, Lanfranc returned to his native town, practised there for a time as an advocate, and opened a school of law. He taught with great success, but the field was too narrow for his ambitious views, and he accordingly removed to Avranches, in Normandy, where his class-rooms were soon filled to overflowing. An accident changed the plan of his life, and induced him to enter the church. Entering the Abbey of

Langeland. Bec as a monk, he rose in the course of three years to be prior. He next established a theological school, which, under his management, became one of the most famous of Western Europe. It was the centre of a new scientific life, which, instead of pursuing the beaten track of church tradition and practical theology, started on a course more dialectical and speculative. Still holding, however, the principle of Augustin, that the sole business of reason was to unfold and defend the data of church tradition, this new dialectical tendency could not fall into collision with the faith of the church. It did, however, come into conflict with a freer tendency of inquiry which had set in, and, under Gotteschalk and Berengar, was turning the tide of speculation to doctrinal controversies. His famous controversy with Berengar, the Archdeacon of Angers, on the subject of the Eucharist, belongs to this period of his life. The dispute originated in a letter which Berengar wrote to him on the subject, in somewhat free-spoken terms, expressing his doubts of the common orthodoxy, but claiming only to be a heretic with Augustin, Ambrose, and Jerome. Lanfranc was then absent at Rome, and the letter became public at the Pontifical Court. Accordingly, in a hasty dread of any stain of heresy, he allowed Berengar to be condemned unheard. Berengar was, however, afterwards cited to Rome, and in the fear of death, recanted. Lanfranc, in after-correspondence, sought to overbear him by a sense of shame, accusing him of perjury; but Berengar held his ground, and still continued to preach his own views. In the voluminous correspondence which passed between them, it seems abundantly evident that Berengar was borne down by passion and power, to which considerable scientific acumen and theological learning gave a keener point and force. Lanfranc's name was now well established, and he was admitted to the most secret counsels of William the Bastard of Normandy, who made him abbot of the new monastery of St Stephen, at Caen. When William became King of England, he gave him the see of Canterbury; and whenever affairs called him back to the continent Lanfranc carried on the government in his absence. After the Conqueror's death, his son William Rufus entrusted to his care the political as well as the ecclesiastical interests of the state, and he was practically King of England till his death, which took place in 1089, after he had completed his eighty-third year. His political career forms part of the history of England, and historians are unanimous in praising his wisdom, forethought, and integrity. In his diocese he did much good by establishing schools, rebuilding the cathedral, which had been destroyed by fire, and vindicating for his see the primacy of all England. The most important of his works are his *Letters*, his *Commentarius in Epistolas B. Pauli*, and his *Libellus de corpore et sanguine Domini, contra Berengarium*. These works display the learning with which their author has been always accredited, along with great force and terseness of reasoning, and great clearness and precision of thought. The style is simple and nervous, and interests the reader in the subject-matter. The best editions of Lanfranc are those of Luc, D'Achery, in 1 vol. fol., Paris, 1648; and Dr Giles, in 2 vols. 8vo, Oxford, 1844.

LANGELAND, an island of Denmark, in the Fühnen group and bailiwick of Svendborg, is situated between Laaland on the E., and Fühnen on the W., and stretches from the Great Belt on the N. to the Baltic Sea on the S. Its extreme length is 32 miles, its average breadth 4 miles, and its area nearly 80 geographical square miles. Its highest eminence, though not above 150 feet, exceeds in elevation the surrounding islands. The climate is salubrious; and the soil is rich, and produces flax, timber, corn, potatoes, and apples in abundance for exportation. A considerable number of cattle is reared, and fishing is extensively carried on. Although the water is very deep on both sides of the island, all harbourage of vessels is prevented on the

E. shore by a never-shifting current, that sweeps along an undented coast. But on the W. coast, the quietness of the sea, and the many creeks along the shore, afford an excellent roadstead and numerous havens. The island contains fifteen parishes, and has Rudkiöbing for its capital. Pop. (1851) 17,368.

LANGENSALZA, a town of Prussian Saxony, government of Erfurt, on the Salza, 19 miles N.W. from Erfurt. Its industrial population are employed in the production of silk, cotton, and woollen fabrics, gunpowder, saltpetre, starch, and other articles. A four-gated wall surrounds the town. Pop. (1849) 8279.

LANGENSCHWALBACH, a watering-place of Nassau, 8 miles N.W. from Wiesbaden, and 15 miles S.S.E. from Nassau. Its celebrity as a resort for English invalids dates from the publication of Head's *Bubbles*. Nearly 200,000 bottles of its mineral waters are exported every year. Pop. 2010.

LANGHOLM, a parish, burgh of barony, and market-town of Scotland, in the county of Dumfries, is situated on the River Esk, 25 miles E.N.E. from Dumfries. Manufactures cotton, woollen plaid, and other fabrics. In the market-place is a monument to Sir Pulteney Malcolm, and another on Langholm Hill to his brother, Sir John. Here were born Telford the engineer, and Meikle the translator of the *Lusiad*. Pop. of burgh (1851) 1406. Adjacent to Langholm is the village of New Langholm, occupied chiefly by weavers engaged in the woollen and linen manufactures. Pop. 1057.

LANGHORNE, JOHN, the English translator of *Plutarch's Lives*, was born in 1735 at Kirkby-Steven, in Westmoreland. He was educated first at Winton, and afterwards at Appleby; but being too poor to go directly to the university, he devoted himself to private teaching, took orders, and began to dabble in literature. In 1760 he entered Clare Hall, Cambridge, as a ten-year man, but does not seem to have taken his degree. He was at this time acting as private tutor in the family of a Lincolnshire gentleman, with whose daughter he fell in love. His suit was rejected, and he betook himself to London, where he became curate of St John's, Clerkenwell, and wrote largely for the periodical press. One of his best pieces was his poem entitled, *Genius and Valour*, in which he defended the Scottish nation against the fierce invective of Churchill's *Prophecy of Famine*. The University of Edinburgh, by the advice of Robertson the historian, acknowledged his goodwill with the degree of D.D. In the following year, 1767, he married the lady by whom he had been rejected some time before. Her friends were rich, and bought for him the living of Blagden, in Somersetshire; but in less than a year after her marriage his wife died in childbed. He felt her loss very keenly. Retiring to Folkestone, in Kent, he joined his brother, perpetual curate of that place. With his assistance he began the translation of Plutarch, which, when published in 1771, made his name widely known, and still preserves it from oblivion. In 1772 he married again, and four years later had the misfortune to lose his second wife from the same cause as the first. He was a man of strong domestic sympathies, and this double calamity quite unhinged his mind. To escape from his griefs, he plunged headlong into the social excitements, of which he had been always, though moderately fond. He died in 1779, in the forty-fifth year of his age. For the details of his life we are chiefly indebted to a memoir of him by his son, prefixed to a posthumous edition of his poems.

Langhorne was a very voluminous writer. His principal works, besides his *Plutarch*, are his *Letters on Religious Retirement*, dedicated to Warburton, 8vo, 1762; *Poetical Works*, 2 vols., 1776, and two volumes of Sermons. He also wrote largely for the press, especially for the *Monthly Review*, to which he contributed many essays and short

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Langland. tales. His translation of Plutarch is correct and literal, but very far from being what a translation of Plutarch ought to be. His poetical pieces never rise above neatness and good taste, but are easy and melodious, and sometimes strike chords of gentle pathos. His prose runs on smoothly and clearly, with no great originality or depth of thought. The manifest tendency to rhetoric is kept within bounds by the same good taste which marks his poetry.

LANGLAND, or LONGLAND, ROBERT, the reputed author of the *Visions of Piers Plowman*, was a native of Cleobury-Mortimer, in Shropshire. Of his personal history nothing is known beyond this, that he was a fellow of Oriel College, Oxford, that he entered the church and became a secular priest, that he lived in the times of Edward III. and Richard II., and that he was one of the earliest followers of Wycliffe. The dates of his birth and death are both unknown, but internal evidence fixes, approximately at least, the time when the *Visions* were written. One passage contains an allusion to the Treaty of Bretigny, made with France in 1360, and to the disasters which brought it about; another describes the great storm of January 15, 1362, as a recent event. "It is probable," says Mr Wright, in his edition of the *Visions*, "that the poem of Piers Plowman was written in the latter part of this year, when the effects of the great wind were fresh in people's memory, and when the Treaty of Bretigny had become a subject of popular discontent." According to Bale, the poem begun, or in hand this year, was completed in 1369.

The poem purports to be a series of visions seen by the author, when he fell asleep "on a May morwenynge," among the Malvern Hills. It consists of twenty "passus," or sections, each passus forming, or professing to form, a separate dream. The connection of the various dreams with each other is so ill-sustained, that the work may be regarded not so much as a single poem, as a succession of poems. The subject and the treatment are very much the same with the *Pilgrim's Progress* of Bunyan. A parallel has been drawn between the two works, suggested in the first instance by the similarity in the names of the personages, and borne out by a resemblance on many points far more important than that merely accidental one. But the general scope of the two allegories is widely different. The *Visions* are professedly satirical, and the satire being directed chiefly against the ignorance, irreligion, and immorality of the ecclesiastical orders. Interspersed are many passages of extraordinary poetical vigour, bursts of serious feeling, and sketches of external nature. These, however, are mere digressions, and the author always returns with new and sharper zest to his favourite theme. From the idea that the *Visions* were not only a religious, but also a kind of Protestant work, they were reprinted at the Reformation no fewer than three times in one year. The fact is, however, that the anti-clerical spirit in Langland is no more decided than it is in Chaucer. Many of the allegories are whimsically ingenious, and are good types of the kind of inventions in vogue in the poetry of the middle ages. The Lady Anima, who represents the soul of man, is placed by Kind, that is Nature, in a castle called Caro, or the Flesh; and the charge of it is committed to the Constable Sir In-wit, a wise knight, whose chief officers are his five sons, See-well, Say-well, Hear-well, Work-well, and Go-well. One of the other figures is Reason, who preaches in the church to the king and his knights, teaching that all the evils of the realm are because of sin. Among the vices who are converted by the sermon we

see Proud-heart, who vows to wear haircloth; Envy, lean, cowering, biting his lips, and wearing the sleeves of a friar's frock; and Covetousness, a bony, beetle-browed, bleary-eyed, ill-clothed caitiff. The metrical structure of the poem is accentual, and is, in fact, a revival of the old alliterative system of metre. Its success in its own day was so great as to prompt many imitations, all, without exception, quite inferior to the original.

The *Vision* has been often printed. There are two sets of MSS. of the poem, containing readings differing considerably from each other. The received version has been frequently published, but the last edition, that of 1842, by Thomas Wright, is beyond all comparison the best. The edition of 1813, by Dr Whitaker, follows the other texts, and is cumbrous, costly, and incorrect, while the glossary and notes are contemptible.

LANGON (the ancient *Alingo*), a town and river-port of France, in the department of Gironde, on the left bank of the Garonne, 25 miles S.S.E. from Bordeaux; its chief manufactures are casks and leather, and its trade is in ship timber, brandy, and the white wines of the district. Pop. 3950.

LANGRES (*Andomatunum Lingonum*), a fortified town of France, department of Haute-Marne, is situate on a hill, at the foot of which the Marne flows, 18 miles S.S.E. from Chaumont. From its excellent cutlery, it is often called the French Sheffield. It trades in cattle, hemp, wine, flour, corn, flax, whetstones, and other articles, and is important in a military point of view, as commanding the passage from the basin of the Saône into that of the Seine. Its cathedral of St Mammée is said to have been founded in 380. The ancient church of St Didier is now converted into a museum. There are also a town-house, a library of 7000 volumes, some hospitals, a communal college, a mercantile court, and a bishop's palace. Langres was the capital of the ancient Lingones, and contains many Roman remains, the principal of which is an arch erected in honour of the two Gordians, A.D. 240. Pop. (1851) 8646.

LANGSIDE, a small village of Scotland, county of Renfrew, 2 miles S. of Glasgow. Here the Regent Murray defeated Queen Mary in 1568.

LANGTON, STEPHEN, Archbishop of Canterbury, was born about the middle of the twelfth century, and is claimed as a son by the counties of Lincoln and Devon. The exact date and the exact spot of his birth are alike unknown. He studied at Paris, and in course of time became chancellor of the University of that city. Soon after the beginning of the thirteenth century he visited Rome. The reigning Pope (Innocent III.) not only made him cardinal of St Chrysogonus, but appointed him to the see of Canterbury, then vacant. John of England refused to sanction the choice of the pontiff, and his refusal led to that memorable contest, which resulted in his complete humiliation. (See ENGLAND, and *John of England*.) It was by Langton's advice that the English barons insisted upon the charter of Runnymede; but his unyielding assertion of their rights against the king, after John had been formally reconciled to the Papal see, brought him into disgrace with Innocent, who suspended him. Langton, however, retained office, and continued to administer the affairs of the church with his wonted skill and vigour till his death in 1228. In letters, Langton did too little to make himself a lasting name, but some small theological essays of his which have been published justify his character as an elegant and accomplished scholar.

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Langton.

LANGUAGE.

Language. I.—ORIGIN OF LANGUAGE: REMARKS ON THE IDIOM AND GENIUS OF LANGUAGE.

Origin of Language. LANGUAGE, in the proper sense of the term, signifies the expression of our ideas and their various relations by certain articulate sounds, which are used as the signs of those ideas and relations. By articulate sounds are meant those modulations of the voice, or of sound emitted from the thorax, which are formed by means of the mouth and its several organs, the teeth, the tongue, the lips, and the palate. In a more general sense, *language* is sometimes used to denote all sounds by which animals of any kind express their particular feelings and impulses in a manner that is intelligible to their own species.

Nature has endowed every animal with powers sufficient to make known those sensations and desires with which it is necessary, for the preservation of the individual or the continuance of the kind, that others of the same species should be acquainted. For this purpose, the organs of all vocal animals are so formed as, upon any particular impulse, to utter sounds, of which those of the same species instinctively know the meaning. The summons of the hen is instantly obeyed by the whole brood of chickens; and in many others of the irrational tribes a similar mode of communication may be observed between the parents and the offspring, and also between one animal and another. But it is not amongst animals of the same species only that these instinctive sounds are mutually understood. It is as necessary for animals to know the voices of their enemies as those of their friends; and the roaring of the lion is a sound of which, previously to all experience, every beast of the forest is naturally afraid. Between these animal voices and the language of men, however, there is very little analogy. Human language is capable of expressing ideas and notions, which there is every reason to believe that the mind of the brutes cannot conceive. "Speech," says Aristotle, "is made to indicate what is expedient and what inexpedient, and, in consequence of this, what is just and unjust. It is therefore given to men, because it is peculiar to them, that of good and evil, just and unjust, they only, with respect to other animals, possess a sense or feeling." The voices of brutes seem intended by nature to express, not distinct ideas or moral modes, but only such feelings as it is for the good of the species that they should have the power of making known; and in this, as in all other respects, these voices are analogous, not to speaking, but to weeping, laughing, singing, groaning, screaming, and other natural and audible expressions of passion or appetite. Another difference between the language of men and the voices of brute animals consists in articulation, by which the former may be resolved into distinct elementary sounds or syllables; whereas the latter, being for the most part inarticulate, are not capable of such a resolution. Hence Homer and Hesiod characterize man by the epithet *μῆτιρ*, or *voice-dividing*, as denoting a power peculiar to the human species; for, though there are a few birds which utter sounds that may be divided into syllables, yet each of these birds utters but one such sound, which seems to be employed rather as a note of natural music than for the purpose of giving information to others; and hence, when the bird is agitated, it utters cries which are very different, and have no articulation.

A third difference between the language of men and the significant cries of brute animals is, that the former is the product of art, the latter derived from nature. Every human language is learned by imitation, and is intelligible only to those who either inhabit the country where it is vernacular, or have been taught it by a master or by books. But the voices in question are not learned by imitation; and being wholly instinctive, they are intelligible to all the animals of that species by which they are uttered, though brought together from the most distant countries on earth. That a dog, which had never heard another bark, would notwithstanding bark himself, and that the barkings or yelps of a Lapland dog would be instinctively understood by the dogs of Spain, Calabria, or any other country, are facts which do not admit of doubt. But there is no reason to imagine that a man, who had never heard any lan-

guage spoken, would himself speak; and it is well known that the language spoken in one country is unintelligible to the natives of another country where a different language is spoken. Indeed, it seems obvious, that were there any instinctive language, the first words uttered by all children would be the same; and that every child, whether born in the desert or in society, would understand the language of every other child, however educated or however neglected. Nay more, we may venture to affirm that such a language, though its general use might, in society, be superseded by the prevailing dialect of art, could never be wholly lost; and that no man of one country would find it difficult, far less impossible, to communicate the knowledge of his natural and most pressing wants to the men of any other country, whether barbarous or civilized. The exercise of cultivated reason, and the arts of civil life, have indeed eradicated many of our original instincts, but they have not eradicated all. [This is doubtful. It is generally believed that the dog, in its natural state, *howls*; it being only where contact with dogs, the companions of man, has (either directly or indirectly) taken place, that it *barks*. Again, children *do* form their earliest words alike, and that independent of imitation.—R. G. L.]

There are external indications of the internal feelings and desires, which appear in the most polished society, and which are confessedly instinctive. The passions, emotions, sensations, and appetites, are naturally expressed in the countenance by characters which the savage and the courtier can read with equal readiness. The serene look, the smoothed brow, the dimpled smile, and the glistening eye, denote equanimity and good will, in terms which no man can mistake. The contracted brow, the glaring eye, the sullen gloom, and the threatening air, denote rage, indignation, and defiance, as plainly and forcibly as revilings or imprecations. To teach men to disguise these instinctive indications of their temper, and

To carry smiles and sunshine in their face,
When discontent sits heavy at their heart,

constitutes a great part of modern manners. Yet, in spite of every effort of the utmost skill, and of every motive resulting from interest, the most consummate hypocrite, or the most hackneyed politician, is not always able to prevent his real disposition from becoming apparent in his countenance. He may, indeed, by long practice, acquire a great command over his temper, and the instinctive signs of it; but at times nature will predominate over art, and a sudden and violent passion will flash in his face, so as to be visible to the eye of every beholder. If these observations be just, and we flatter ourselves that no man will call them in question, it seems to follow, that if mankind were prompted by instinct to use articulate sounds as indications of their passions, affections, sensations, and ideas, the language of nature could never be wholly forgotten, and that it would sometimes predominate over the language of art. Groans, sighs, and some inarticulate lively sounds, are naturally expressive of pain and pleasure, and equally intelligible to all mankind. The occasional use of these no art can wholly banish; and if there were articulate sounds, naturally expressive of the same feelings, it is not conceivable that art or education could banish the use of them, merely because, by the organs of the mouth, they are broken into parts and resolvable into syllables.

It being thus evident that there is no instinctive articulated language, it has become an inquiry of some importance, how mankind were first induced to fabricate articulate sounds, and to employ them for the purpose of communicating their thoughts. Children learn to speak by insensible imitation; and when advanced some years in life they study foreign languages under proper instructors. But the first men had no speakers to imitate, and no foreign language to study. By what means, then, did they learn to speak? On this question only two opinions can possibly be formed. Either language must have been originally revealed from heaven, or it must be the fruit of human invention.

Language.

The latter opinion is strongly supported by Lord Monboddo in his very learned and able work on the *Origin and Progress of Language*. But he candidly acknowledges, that if language was invented, it was of very difficult invention, and far beyond the reach of the grossest savages. Accordingly he holds, that though men were originally solitary animals, and had no natural propensity to the social life; yet, before language could be invented, they must have been associated for ages, and have carried on in concert some common work. Nay, he is decidedly of opinion, that before the invention of an art so difficult as language, men must not only have herded together, but also formed some kind of civil polity, existed in that political state a very long time, and acquired such powers of abstraction as to be able to form general ideas. But it is obvious, that men could not have instituted civil polity or carried on in concert any common work, without communicating their designs to each other; and there are four ways by which the author thinks that this might have been done before the invention of speech, viz.,—1st, *Inarticulate cries*, expressive of sentiments and passions; 2d, *Gestures*, and *the expression of countenance*; 3d, *Imitative sounds*, expressive of audible things; and, 4th, *Painting*, by which visible objects may be represented.

Of these four ways of communication, it is plain that only two have any connection with language, inarticulate cries and imitative sounds; and of these the author abandons the latter as having contributed nothing to the invention of articulation, though he thinks it may have helped to advance its progress. "I am disposed," says he, "to believe, that the framing of words with an analogy to the sound of the things expressed by them, belongs rather to languages of art, than to the first languages spoken by rude and barbarous nations." It is, therefore, inarticulate cries only that must have given rise to the formation of language. Such cries are used by all animals who have any use of voice, to express their wants; and the fact is, that all barbarous nations have cries expressing different things, such as joy, grief, terror, surprise, and the like. These, together with gestures and expressions of the countenance, were undoubtedly the methods of communication first used by men. We have but to suppose, says our author, a great number of our species carrying on some common business, and conversing together by signs and cries; and we have men just in a state proper for the invention of language. For, if we suppose their numbers to have increased, their wants would also increase; and then these two methods of communication would become too confined for that larger sphere of life which their wants would make necessary. The only thing, then, that remained to be done, was to give a greater variety to the instinctive cries; and as the natural progress is from what is easy to what is more difficult, the first variation would be merely by tones from low to high, and from grave to acute. But this variety could not answer all the purposes of speech in society; and being advanced so far, it was natural that an animal so sagacious as man would go on farther, and come at last to the only other variation remaining, namely, articulation. The first articulation would be very simple, the voice being broken, and distinguished only by a few vowels and consonants. And as all natural cries are from the throat and larynx, with little or no operation of the organs of the mouth, it is natural to suppose, that the first languages were for the greater part spoken from the throat; that what consonants were used to vary the cries were mostly guttural; and that the organs of the mouth would at first be very little employed. From this account of the origin of language it appears, that the first sounds articulated were the natural cries by which men signified their wants and desires to one another, such as calling one another for certain purposes, and other such things as were most necessary for carrying on any joint work; then in process of time other cries would be articulated, to signify that such and such actions had been performed or were performing, or that such and such events had happened relative to the common business. The names of such objects as they were conversant with would be invented; but as we cannot suppose savages to be deep in abstraction, or skilful in the art of arranging things according to their *genera* and *species*, all things, however similar, except, perhaps, the individuals of the lowest species, would be expressed by different words not related to each other either by derivation or composition. Thus would language grow by degrees; and as it grew, it would be

more and more broken and articulated by consonants; but still Language. the words would retain a great deal of their original nature of animal cries. And thus things would go on, words unrelated still multiplying, till at last the language would become too cumbersome for use, and then art would be obliged to interpose, and form a language upon a few radical words, according to the rules and method of etymology.

Those who think that language was originally revealed from heaven, consider this account of its human invention as a series of mere suppositions hanging loosely together, and the whole suspended from no fixed principle. The opinions of Diodorus, Vitruvius, Horace, Lucretius, and Cicero, which are frequently quoted in its support, are in their estimation of no greater authority than the opinions of other men; for as language was formed and brought to a great degree of perfection long before the era of any historian with whom we are acquainted, the antiquity of the Greek and Roman writers, who are comparatively of yesterday, gives them no advantage in this inquiry over the philosophers of France and England. Aristotle has defined man to be a *ζῷον μιμητικόν*, or imitative animal; and the definition is certainly so far just, that man is much more remarkable for imitation than invention; therefore, say the reasoners on this side of the question, had the human race been originally *mutum et turpe pecus*, they would have continued so to the end of time, unless they had been taught to speak by some superior intelligence. That the first men sprung from the earth like vegetables, no modern philosopher has ventured to assert; nor does there anywhere appear sufficient evidence that men were originally in the state of savages. The oldest book extant contains the only rational cosmogony known to the ancient nations; and that book represents the first human inhabitants of this earth, not only as reasoning and speaking animals, but also as in a state of high perfection and happiness, of which they were deprived for disobedience to their Creator. Moses, setting aside his claim to inspiration, deserves, from the consistency of his narrative, at least as much credit as Moschus, or Democritus, or Epicurus; and, from his prior antiquity, if antiquity could on this subject have any weight, he would deserve more, as having lived nearer to the period of which they all write. But the question respecting the origin of language may be decided without resting on authority of any kind, merely by considering the nature of speech, and the mental and corporeal powers of man. Those who maintain it to be of human invention, suppose men at first to have been solitary animals, afterwards to have herded together without government or subordination, then to have formed political societies, and by their own exertions to have advanced from the grossest ignorance to the refinements of science. But, say the reasoners, whose cause we are now pleading, this is a supposition contrary to all history and all experience. There is not upon record a single instance well authenticated of a people emerging by their own efforts from barbarism to civilization. There have indeed been many nations raised from the state of savages; but it is known that they were polished, not by their own repeated exertions, but by the influence of individuals or colonies from nations more enlightened than themselves. The original savages of Greece were tamed by the Pelasgi, a foreign tribe; and were afterwards further polished by Orpheus, Cecrops, Cadmus, and others, who derived their knowledge from Egypt and the East. The ancient Romans, a ferocious and motley crew, received the blessings of law and religion from a succession of foreign kings; and the conquests of Rome, at a later period, contributed to civilize the rest of Europe. In America, the only two nations which, at the invasion of the Spaniards, could be said to have advanced a single step from barbarism, were indebted for their superiority over the other tribes, not to the gradual and unassisted progress of the human mind, but to the wise institutions of foreign legislators.

This is not the proper place for tracing the progress of man from the savage state to that of political society; but experience teaches us, that in every art it is much easier to improve than to invent? The human mind, when put into the proper track, is indeed capable of making great advances in arts and sciences; but, if any credit is due to the records of history, it has not, in a people sunk in ignorance and barbarity, sufficient vigour to discover that track, or to conceive a state different from the present. If the rudest inhabitants of America and

Language. other countries have continued, as there is every reason to believe they have continued, for ages in the same unvaried state of barbarism; how is it imaginable that people so much ruder than they as to be ignorant of all language, should think of inventing an art so difficult as that of speech, or even to frame a conception of the thing. In building, fishing, hunting, navigating, and the like, they might imitate the instinctive arts of other animals, but there is no other animal that expresses its sensations and affections by arbitrary articulate sounds. It is said, that before language could be invented, mankind must have existed for ages in large political societies, and have carried on in concert some common work; but if inarticulate cries, and the natural visible signs of the passions and affections, were modes of communication sufficiently accurate to keep a large society together for ages, and to direct its members in the execution of some common work, what could be their inducement to the invention of an art so useful and difficult as that of language?

Let us however suppose, say the advocates for the cause which we are now supporting, that different nations of savages set about inventing an art of communicating their thoughts, which experience had taught them was not absolutely necessary; how came they all, without exception, to think of the one art of articulating the voice for this purpose? Inarticulate cries, out of which language is fabricated, have indeed an instinctive connection with our passions and affections; but there are gestures and expressions of countenance with which our passions and affections are in the same manner connected. If the natural cries of passion could be so modified and enlarged as to be capable of communicating to the hearer every idea in the mind of the speaker, it is certain that the natural gestures could be so modified as to answer the very same purpose; and it is strange that, among the several nations who invented languages, not one should have stumbled upon fabricating visible signs of their ideas, but that all should have agreed to denote them by articulated sounds. Every nation whose language is narrow and rude, supplies its defects by a violent gesticulation; and therefore, as much less genius is exerted in the improvement of any art than was requisite for its first invention, it is natural to suppose that, had men been left to devise for themselves a method of communicating their thoughts, they would not have attempted any other than that by which they now improve the language transmitted by their fathers. It is vain to urge that articulate sounds are fitter for the purpose of communicating thought than visible gesticulation; for, though this may be true, it is a truth which could hardly occur to savages, who had never experienced the fitness of either; and if, to counterbalance the superior fitness of articulation, its extreme difficulty be taken into view, it must appear little less than miraculous that every savage tribe should think of it rather than the easier method of artificial gesticulation. Savages, it is well known, are remarkable for their indolence, and for always preferring ease to utility; but their modes of life give such pliancy to their bodies, that they could with very little trouble bend their limbs and members into any positions agreed upon as the signs of ideas. This is so far from being the case with respect to the organs of articulation, that it is with extreme difficulty, if at all, that a man advanced in life can be taught to articulate any sound which he has not been accustomed to hear. No foreigner who comes to England after the age of thirty ever pronounces the language tolerably well; an Englishman of that age can hardly be taught to utter the guttural sound which a Scotsman gives to the Greek χ , or even the French sound of the vowel τ ; and of the solitary savages who have been caught in different forests, we know not that there has been one who, after the age of manhood, learned to articulate any language so as to make himself readily understood. The present age has indeed furnished many instances of deaf persons being taught to speak intelligibly by skillful masters moulding the organs of the mouth into the positions proper for articulating the voice; but who was to perform this task amongst the inventors of language, when all mankind were equally ignorant of the means by which articulation is effected? In a word, daily experience informs us, that men who have not learned to articulate in their childhood, never afterwards acquire the faculty of speech but by such helps as savages cannot obtain; and therefore, if speech was invented at all, it must have been

Language. either by children who were incapable of invention, or by men who were incapable of speech. A thousand, nay, a million, of children could not think of inventing a language. While the organs are pliable, there is not understanding enough to frame the conception of a language; and by the time that there is understanding, the organs are become too stiff for the task, and therefore, say the advocates for the divine origin of language, reason as well as history intimates, that mankind in all ages must have been speaking animals—the young having constantly acquired this art by imitating those who were older; and we may warrantably conclude, that our first parents received it by immediate inspiration.

To this account of the origin of language an objection readily offers itself. If the first language was communicated by inspiration, it must have been perfect, and held in reverence by those who spake it, in other words, by all mankind. But a vast variety of languages have prevailed in the world; and some of these which remain are known to be very imperfect, whilst there is reason to believe that many others are lost. If different languages were originally invented by different nations, all this would naturally follow from the mixture of these nations; but what could induce men possessed of one perfect language of divine original, to forsake it for barbarous jargons of their own invention, and in every respect inferior to that with which their forefathers or themselves had been inspired?

In answer to this objection, it is said, that nothing was given by inspiration but the faculty of speech and the elements of language; for, when once men had language, it is easy to conceive how they might have modified it by their natural powers, as thousands can improve what they could not invent. The first language, if given by inspiration, must, in its principles, have had all the perfection of which language is susceptible; but from the nature of things it could not possibly be very copious. The words of language are either proper names or the signs of ideas and relations; but it cannot be supposed that the All-wise Instructor would load the memories of men with words to denote things then unknown, or with the signs of ideas which they had not then acquired. It was sufficient that a foundation was laid of such a nature as would support the largest superstructure which they might ever after have occasion to raise upon it, and that they were taught the method of building by composition and derivation. This would long preserve the language radically the same, though it could not prevent the introduction of different dialects in the different countries over which men spread themselves. In whatever region we suppose the human race to have been originally placed, the increase of their numbers would, in process of time, either disperse them into different nations, or extend the one nation to a vast distance on all sides from what we may call the seat of government. In either case they would everywhere meet with new objects, which would occasion the invention of new names; and as the difference of climate and other natural causes would compel those who removed eastward or northward to adopt modes of life in many respects different from the modes of those who travelled towards the west or the south, a vast number of words would in one country be fabricated to denote complex conceptions, which must necessarily be unintelligible to the body of the people inhabiting countries where those conceptions had never been formed. Thus would various dialects be unavoidably introduced into the original language, even whilst all mankind remained in one society and under one government. But after separate and independent societies were formed, these variations would become more numerous, and the several dialects would deviate farther and farther from each other, as well as from the idiom and genius of the parent tongue, in proportion to the distance of the tribes by whom they were spoken.

[This is not sufficient. Languages ought, by hypothesis, to graduate into each other more than they do. In order to account for the existing lines of demarcation, which are broad and definite, we must bear in mind a fresh phenomenon, viz., the spread of one dialect at the expense of others, a fact which obliterates intermediate forms, and brings extreme ones into geographical juxtaposition.]

And here it may be noticed, that the distribution of languages over the earth's surface is irregular. In all the quarters of the world we find the two kinds of areas contrasted with one another. In the one, a single language, with a

Language. *minimum* amount of dialectual difference, is spread over a vast extent of country; in the other, a multiplicity of mutually unintelligible forms of speech is found within a small compass.

In Europe, the Slavonic tongues have a large, the Biscayan a small area.

In Asia, the Turk area is large, that of the languages of Caucasus, Nepaul, &c., small.

In Africa, the Berber is large, and certain Abyssinian and other areas small.

In Polynesia, the Malay and Polynesian are large, the Papuan area small.

In America there are numberless small areas; but the Algonkin, Guarani, and a few others, are large.—R. G. L.]

If we suppose a few people either to have been banished together from the society of their brethren, or to have wandered of their own accord to a distance, from which, through trackless forests, they could not return (and such emigrations have often taken place), it is easy to see how the most copious language must in their mouths have soon become narrow, and how the offspring of inspiration must have in time become so deformed as hardly to retain a feature of the ancestor whence it originally sprung. Men do not long retain a practical skill in those arts which they never exercise; and there are abundance of facts to prove, that a single man cast upon a desert island, and having to provide the necessities of life by his own ingenuity, would soon lose the art of speaking with fluency his mother tongue. A small number of men cast away together, would indeed retain that art somewhat longer; but in a space of time not very long, it would in a great measure be lost by them or their posterity. In this state of banishment, as their time would be almost wholly occupied in hunting, fishing, and other means within their reach, to support a wretched existence, they would have very little leisure, and perhaps less desire, to preserve by conversation the remembrance of that ease and those comforts of which they now found themselves for ever deprived: and they would of course soon forget all the words which in their native language had been used to denote the accommodations and elegancies of polished life. This at least seems to be certain, that they would not attempt to teach their children a part of language which in their circumstances could be of no use to them, and of which it would be impossible to make them comprehend the meaning; for where there are no ideas, the signs of ideas cannot be made intelligible. From such colonies as this, dispersed over the earth, it is probable that all those nations of savages have arisen, which have induced so many philosophers to imagine that the state of the savage was the original state of man; and if so, we see that from the language of inspiration must have unavoidably sprung a number of different dialects, all extremely rude and narrow, and retaining nothing of the parent tongue, except perhaps the names of the most conspicuous objects of nature, and of those wants and enjoyments which are inseparable from humanity. The savage state has no artificial wants, and

furnishes few ideas that require *terms* to express them. The Language. habits of solitude and silence incline a savage rarely to speak; and when he speaks, he uses the same terms to denote different ideas. Speech, therefore, in this rude condition of men, must be extremely narrow, and extremely various. Every new region, and every new climate, suggests different ideas, and creates different wants, which must be expressed either by terms entirely new, or by old terms used with a new signification. Hence must originate great diversity, even in the first elements of speech, among all savage nations, the words retained of the original language being used in various senses, and pronounced, as we may believe, with various accents.

When any of those savage tribes emerged from their barbarism, whether by their own efforts or by the aid of people more enlightened than themselves, it is obvious that the improvement and copiousness of their language would keep pace with their own progress in knowledge, and in the arts of civil life; but, in the infinite multitude of words which civilization and refinement add to language, it would be little less than miraculous were any two nations to agree upon the same sounds to represent the same ideas. Superior refinement, indeed, may induce imitation, conquests may impose a language, and extension of empires may melt down different nations and different dialects into one mass; but independent tribes naturally give rise to diversity of tongues; nor does it seem possible that they should retain more of the original language than the words expressive of those objects with which all men are at all times equally concerned. The variety of tongues, therefore, the copiousness of some, and the narrowness of others, furnish no good objection to the divine origin of language in general; for, whether language was at first revealed from heaven, or in a course of ages invented by men, a multitude of dialects would inevitably arise as soon as the human race had separated into a number of distinct and independent nations.¹

As the knowledge of languages constitutes a great part of *Idiom* and erudition, as their beauties and deformities furnish employ- *genius of* ment to taste, and as these depend much upon the idioms of language. the different tongues, we shall proceed to make a few remarks upon the advantages and defects of some of those idioms of language with which we are best acquainted. As the words *idiom* and *genius* of a language are often confounded, it will be necessary to inform the reader, that by *idiom* we would here be understood to mean that general mode of arranging words into sentences which prevails in any particular language; and by the *genius* of a language, we mean to express the particular set of ideas which the words of any language, either from their formation or multiplicity, are most naturally apt to excite in the mind of any one who hears it properly uttered. Thus, although the English, French, Italian, and Spanish languages nearly agree in the same general *idiom*, yet the particular *genius* of each is remarkably different. The English is naturally bold, nervous, and strongly articulated; the French is weaker, and more flowing; the Italian

¹ In the foregoing view of this subject, the argument for the supernatural origin of language is evidently that which the author wishes to favour. But though we have, with some slight alterations, reprinted this part of the article, which was written for the earlier editions of this work, we are far from adopting the very unphilosophical opinion which it supports. We do not assert, because we could have nothing like evidence for such an assertion, that the Deity did not originally bestow on man the gift of speech; but we think, with Lord Monboddo, and many others, that if such a boon ever was conferred, it must, in the revolutions and calamities that have befallen the human race, inevitably have been lost; and, therefore, that as multitudes of languages exist and have ever existed, the art of speech is one which man is capable of attaining to, independently of any supernatural aid. This is the view taken by our best philosophers. Thus, Mr Stewart, notwithstanding his well-known caution in forming conclusions on momentous subjects, unhesitatingly avows his conviction, that "the human faculties are competent to the formation of language." (*Philosophy of the Mind*, vol. iii., chap. I.) In another place, the same admirable writer makes the following philosophical observations on this subject:—"The steps in the formation of language cannot probably be determined with certainty; yet if we can show, from the known principles of human nature, how the various parts may naturally have arisen, the mind is not only to a certain degree satisfied, but a check is given to that indolent philosophy which refers to a miracle whatever appearances, either in the natural or moral world, it is unable to explain." One of the most ingenious attempts that ever has been made to show by what steps the human mind would naturally proceed in the acquisition of speech, is that contained in Dr Adam Smith's "Considerations on the Formation of Languages." His theory may perhaps be liable to objection in some of its details; but it is developed with singular clearness and simplicity; and it must, in its general scope and design, be allowed by all candid and competent judges to be eminently philosophical. This essay was annexed by its author to the first edition of his *Theory of Moral Sentiments*; and we are told by Mr Stewart, that he always regarded it with great partiality, and that he reprinted it, without a single alteration, in the last edition of that work which he himself revised. Mr Stewart's commentary upon it (*Philosophy of the Mind*, ubi supra) ought to be perused along with it. [The phenomena of languages are those of Growth and Development, rather than those of an organic whole invented at once. The process by which these phenomena are studied is all that can here be noticed. We begin with language as it exists at present, and eliminate whatever we can trace to a recent origin, e.g., abstract terms, conjunctions, inflections, &c. Doing this, though we never come to the original nucleus of language, we soon become satisfied that that was exceedingly small.—R. G. L.]

Language. more soothing and harmonious ; and the Spanish more grave, sonorous, and stately. Now, when we examine the several languages which have been most esteemed in Europe, we find that there are only two *idioms* among them which are essentially distinguished from one another ; and all those languages are divided between those two idioms, following sometimes the one and sometimes the other, either wholly or in part. The languages which may be said to adhere to the first *idiom*, are those which, in their construction, follow the order of nature ; that is, express their ideas in the natural order in which they occur to the mind ;—the subject which occasions the action appearing first ; then the action accompanied with its several modifications ; and, last of all, the object to which it has reference. These may properly be called *analogous* languages ; and of this kind are the English, French, and most of the modern languages in Europe. The languages which may be referred to the other *idiom*, are those which follow no other order in their construction than what the taste or fancy of the composer may suggest ; sometimes making the object, sometimes the action, and sometimes the modification of the action, to precede or follow the other parts. The confusion which this might occasion is avoided by the particular manner of *inflecting* their words, by which they are made to refer to the others with which they ought to be connected, in whatever part of the sentence they occur, the mind being left at liberty to connect the several parts with one another after the whole sentence is concluded ; and as the words may be here transposed at pleasure, those languages may be called *transpositive* languages. To this class we must, in an especial manner, refer the Latin and Greek languages. As each of these *idioms* has several advantages and defects peculiar to itself, we shall endeavour to point out the most considerable of them, in order to ascertain with greater precision the particular character and excellence of some of those languages now principally spoken or studied in Europe.

The partiality which our forefathers, at the revival of letters in Europe, naturally entertained for the Greek and Roman languages, made them look upon every distinguishing peculiarity belonging to them as *one* of the *many* causes of the amazing superiority which those languages evidently enjoyed above every other at that time spoken in Europe. This blind deference still continues to be paid to them, as our minds are early prepossessed with these ideas, and as we are taught in our earliest infancy to believe, that to entertain the least idea of our own language being equal to the Greek or Latin in any particular whatever, would be a certain mark of ignorance or want of taste. Their rights, therefore, like those of the church in former ages, remain still to be examined ; and we, without exerting our reason to discover truth from falsehood, tamely sit down satisfied with the idea of their undoubted pre-eminence in every respect. But if we look around us for a moment, and observe the many excellent productions which are to be met with in almost every language of Europe, we must be satisfied that *even these* are now possessed of *some* powers which might afford at least a presumption, that if they were cultivated with a proper degree of attention, they might, in *some respects*, be made to rival, if not to excel, those beautiful and justly admired remains of antiquity. Without endeavouring to derogate from their merit, let us, with the cool eye of philosophic reasoning, endeavour to bring before the sacred tribunal of truth some of those opinions which have been most generally received upon this subject, and rest the determination of the cause on her impartial decision.

The learned reader well knows, that the several changes which take place in the arrangement of the words in every *transpositive* language, could not be admitted without occasioning great confusion, unless certain classes of words were endowed with particular variations, by means of which they might be made to refer to the other words with which they ought naturally to be connected. From this cause proceeds the necessity of several variations of *verbs, nouns, and adjectives* ; which are not in the least essential or necessary in the *analogous* languages, as we have pretty fully explained under the article GRAMMAR, to which we refer for satisfaction on this head. We shall, in this place, consider whether these variations are an advantage or a disadvantage to language.

As it is generally supposed that every language, the verbs of which admit of *inflection*, is on that account much more

perfect than one where they are varied by *auxiliaries*, we shall, in the first place, examine this with some degree of attention ; and, that what is said on this head may be the more intelligible, we shall give examples from the Latin and English languages. We make choice of these languages, because the Latin is more purely *transpositive* than the Greek, and the English admits of less *inflection* than any other language that we are acquainted with.

If any preference be due to a language from the one or the other method of *conjugating* verbs, it must in a great measure be owing to one or other of these three causes : Either it must admit of a greater variety of sounds, and consequently afford more scope for harmonious diversity of tones in the language ; or a greater freedom of expression is allowed in uttering any simple idea, by the one admitting of a greater variety in the arrangement of the words which are necessary to express that idea than the other does ; or, lastly, a greater precision and accuracy in fixing the meaning of the person who uses the language, arise from the use of one of these forms rather than from the use of the other. For, as all the other circumstances which may serve to give a diversity to language, such as the general and most prevalent sounds, the frequent repetition of any one particular letter, and a variety of other circumstances of that nature, which may serve to debase a particular language, are not influenced in the least by the different methods of varying the verbs, they cannot be here considered. We shall therefore proceed to make a comparison of the advantages or disadvantages which may accrue to a language by inflecting its verbs, with regard to the variety of sound, variety of arrangement, and accuracy of meaning.

The first particular that we have to examine is, whether the one method of expressing the variations of a verb admits of a greater variety of sounds. In this respect the Latin seems, at first view, to have a great advantage over the English ; since the words, *amo, amabam, amaveram, amavero, amem, &c.*, seem to be more different from one another than the English translations of these, *I love, I was loving, I had loved, I shall have loved, I may love, &c.* ; for although the syllable *am* is repeated in every one of the first, yet, as the last syllable usually strikes the ear with greater force, and leaves a greater impression than the first, it is very probable that many will think the frequent repetition of the word *love*, in the last instance, more striking to the ear than the repetition of *am* in the former. We will therefore allow this its full weight, and grant that there is as great, or even a greater, difference between the sounds of the different *tenses* of a Latin verb, than there is between the words that are equivalent to them in English. But as we here consider the variety of sounds of the language in general, before any just conclusion can be drawn, we must not only compare the different parts of the same verb, but also compare the different verbs with one another in each of these languages. And here, at first view, we perceive a most striking distinction in favour of the *analogous* language over the *inflected* ; for, as it would be impossible to form a particular set of inflections, different from one another, for each particular verb, all those languages which have adopted this method have been obliged to reduce their verbs into a small number of classes, all the words of each of which classes, commonly called *conjugations*, have the several variations of the *moods, tenses, and persons*, expressed exactly in the same manner, which must of necessity introduce a similarity of sounds into the language in general, much greater than where every particular verb always retains its own distinguishing sound. To be convinced of this, we need only repeat any number of verbs in Latin and English, and observe on which side the preference with respect to variety of sounds must fall.

Pono,	<i>I put.</i>	Moveo,	<i>I move.</i>
Dono,	<i>I give.</i>	Doleo,	<i>I ail.</i>
Cano,	<i>I sing.</i>	Lugeo,	<i>I mourn.</i>
Sono,	<i>I sound.</i>	Obeo,	<i>I die.</i>
Orno,	<i>I adorn.</i>	Gaudeo,	<i>I rejoice.</i>
Pugno,	<i>I fight.</i>	Incipio,	<i>I begin.</i>
Lego,	<i>I read.</i>	Facio,	<i>I make.</i>
Scribo,	<i>I write.</i>	Fodio,	<i>I dig.</i>
Puto,	<i>I think.</i>	Rideo,	<i>I laugh.</i>
Vivo,	<i>I love.</i>	Impleo,	<i>I fill.</i>
Ambulo,	<i>I walk.</i>	Abstineo,	<i>I forbear.</i>

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The similarity of sounds is here so obvious in the Latin, as to be perceived at the first glance; nor can we be surprised to find it so, when we consider that all their regular verbs, amounting to four thousand or upwards, must be reduced to four conjugations, and even these differing but little from one another, which must of necessity produce the sameness of sounds which we here perceive; whereas, every language that follows the natural order, like the English, instead of this small number of uniform terminations, has almost as many distinct sounds as original verbs.

But if, instead of the present of the indicative mood, we should take almost any other tense of the Latin verb, the similarity of sounds would still be more perceptible, as many of these tenses have the same termination in all the four conjugations, particularly in the imperfect of the indicative, as below:—

Pone-bam,	<i>I did put,</i>	or <i>was putting.</i>
Dona-bam,	<i>I did give,</i>	or <i>was giving.</i>
Cane-bam,	<i>I did sing,</i>	or <i>was singing.</i>
Sona-bam,	<i>I did sound,</i>	or <i>was sounding.</i>
Orna-bam,	<i>I did adorn,</i>	or <i>was adorning.</i>
Pugna-bam,	<i>I did fight,</i>	or <i>was fighting.</i>
Lege-bam,	<i>I did read,</i>	or <i>was reading.</i>
Scribe-bam,	<i>I did write,</i>	or <i>was writing.</i>
Putā-bam,	<i>I did think,</i>	or <i>was thinking.</i>
Vive-bam,	<i>I did live,</i>	or <i>was living.</i>
Ambula-bam,	<i>I did walk,</i>	or <i>was walking.</i>
Move-bam,	<i>I did move,</i>	or <i>was moving.</i>
Dole-bam,	<i>I did ail,</i>	or <i>was ailing.</i>
Luge-bam,	<i>I did mourn,</i>	or <i>was mourning.</i>
Obi-bam,	<i>I did die,</i>	or <i>was dying.</i>
Gaude-bam,	<i>I did rejoice,</i>	or <i>was rejoicing.</i>
Incipie-bam,	<i>I did begin,</i>	or <i>was beginning.</i>
Facie-bam,	<i>I did make,</i>	or <i>was making.</i>
Fodie-bam,	<i>I did dig,</i>	or <i>was digging.</i>
Ride-bam,	<i>I did laugh,</i>	or <i>was laughing.</i>
Imple-bam,	<i>I did fill,</i>	or <i>was filling.</i>
Abstine-bam,	<i>I did forbear,</i>	or <i>was forbearing.</i>

It is unnecessary to make any remarks on the Latin words in this example. But in the English translation we have carefully marked in the first column the words without any inflection; and in the second, have put down the same meaning by an inflection of our verb; which we have been enabled to do, from a peculiar excellency in our own language unknown to any other, either ancient or modern. Were it necessary to pursue this subject farther, we might observe, that the *perfect* tense in all the conjugations ends universally in *i*, the *pluperfect* in *eram*, and the *future* in *am* or *bo*; in the subjunctive mood the *imperfect* universally in *em*, the *perfect* in *erim*, the *pluperfect* in *issem*, and the *future* in *ero*; and as a still greater sameness is observable in the different variations for the persons in these tenses, seeing the first person plural in all tenses ends in *mus*, and the second person in *ris*, with little variation in the other persons, it is evident that, in respect to diversity of sounds, this method of conjugating verbs by *inflection* is greatly inferior to the more natural method of expressing the various connections and relations of the verbal attribute by different words, usually called *auxiliaries*.

The second particular by which the different methods of marking the relation of the verbal attribute can affect language, arises from the variety of expressions which either of these may admit of in uttering the same sentiment. In this respect likewise, the method of conjugation by inflection seems to be deficient. Thus the present of the indicative mood in Latin can at most be expressed only in two ways, viz., *scribo* and *ego scribo*, which ought, perhaps, in strictness to be admitted only as one; whereas, in English, we can vary it in four different ways, viz.,—1st, *I write*; 2dly, *I no write*;

3dly, *WRITE I do*; 4thly, *WRITE DO I*.¹ And if we consider Language. the further variation which these receive in power as well as in sound, by having the emphasis placed on the different words, instead of four we will find eleven different variations. Thus, *I write*, with the emphasis upon the *I*; *I write*, with the emphasis upon the word *write*. Let any one pronounce these with the different emphasis necessary, and he will be immediately satisfied that they are not only distinct from each other with respect to meaning, but also with regard to sound. The same must be understood of all the other parts of this example:—

<i>I do write.</i>	<i>Write I DO.</i>
<i>I DO write.</i>	<i>WRITE DO I.</i>
<i>I do WRITE.</i>	<i>Write DO I.</i>
<i>WRITE I do.</i>	<i>Write DO I.</i>
<i>Write I do.</i>	

None of the Latin tenses admit of more variations than the two above mentioned: nor do almost any of the English admit of fewer than in the above example; and several of these phrases, which must be considered as exact translations of some of the tenses of the Latin verb, admit of many more. Thus the imperfect of the subjunctive mood, which in Latin admits of the above two variations, admits in English of the following:—

<i>I might have written.</i>	<i>Written might have I.</i>
<i>Written I might have.</i>	<i>I written might have.</i>
<i>Have written I might.</i>	<i>Have written might I.</i>

And if we likewise consider the variations which may be produced by a variation of the emphasis, they will be as under:—

<i>I might have written.</i>	<i>WRITTEN might have I.</i>
<i>I MIGHT have written.</i>	<i>Written MIGHT have I.</i>
<i>I might HAVE written.</i>	<i>Written might HAVE I.</i>
<i>I might have WRITTEN.</i>	<i>Written might have I.</i>
<i>WRITTEN I might have.</i>	<i>I written might have.</i>
<i>Written I might have.</i>	<i>I WRITTEN might have.</i>
<i>Written I MIGHT have.</i>	<i>I written MIGHT have.</i>
<i>Written I might HAVE.</i>	<i>I written might HAVE.</i>
<i>HAVE written I might.</i>	<i>HAVE written might I.</i>
<i>Have WRITTEN I might.</i>	<i>Have WRITTEN might I.</i>
<i>Have written I might.</i>	<i>Have written MIGHT I.</i>
<i>Have written I MIGHT.</i>	<i>Have written might I.</i>

In all, twenty-four variations, instead of two. If we likewise consider that the Latins were obliged to employ the same word, not only to express "*I might have written*," but also, "*I could*," "*I would*," or "*I should have written*," each of which would admit of the same variations as the word *might*, we have in all *ninety-six* different expressions in English for the same phrase, which in Latin admits only of two, unless they have recourse to other forced turns of expression, which the defects of their verbs in this particular has compelled them to invent.

But if it should be objected that the last circumstance we have taken notice of as a defect can only be considered as a defect of the Latin language, and is not to be attributed to the inflection of their verbs, seeing they might have had a particular tense for each of these different words *might*, *could*, *would*, and *should*; we answer, that, even admitting this excuse to be valid, the superiority of the analogous language as such still remains in this respect as twelve to one. Yet even this concession is greater than ought to have been made. For as the difficulty of forming a sufficient variety of words for all the different modifications which a verb may be made to undergo is too great for any rude people to overcome, we find, that every nation which has adopted this mode of inflection, not excepting the Greeks themselves, has been obliged to remain satisfied with fewer words than would have been necessary even to effect this purpose, and make the same word serve a double, triple,

¹ We are sufficiently aware that the last variation cannot in strictness be considered as good language, although many examples of this manner of using it in serious composition, both in poetry and prose, might easily be produced from the best authors in the English language. But, however unjustifiable it may be to use it in serious composition, yet, when judiciously employed in works of humour, this and other forced expressions of the like nature produce a fine effect, by giving a burlesque air to the language, and beautifully contrasting it with the purer diction of solid reasoning. Shakespeare has on many occasions showed how successfully these may be employed in composition, particularly in drawing the character of Ancient Pistol in Henry V. Without this liberty, Butler would have found greater difficulty in drawing the inimitable character of Hudibras. Let this apology suffice for having inserted this and other variations of the same kind, which, although they may be often improper for serious composition, have still their use in language.

Language. or even quadruple office, as in the Latin tense which gave rise to these observations. So that, however, in physical necessity this may not be chargeable upon the particular mode of construction, yet in moral certainty it must always be the case; and, therefore, we may safely conclude, that the mode of varying verbs by inflection affords less variety in the arrangement of the words of the particular phrases, than the method of varying them by the help of auxiliaries.

But if there should still remain any shadow of doubt in the mind of the reader, whether the method of varying the verbs by *inflection* is inferior to that by *auxiliaries*, with regard to diversity of sounds or variety of expression, there cannot be the least doubt that, with respect to precision, distinctness, and accuracy in expressing any idea, the latter enjoys a superiority beyond all comparison. Thus, the Latin verb *amo* may be Englished either by the words *I love* or *I do love*, and the emphasis placed upon any of the words that the circumstances may require; by means of which the meaning is pointed out with a force and energy which it is altogether impossible to produce by the use of any single word. The following line from Shakspeare's *Othello* may serve as an example:—

“Excellent wretch!
Perdition catch my soul, but *I do love thee*.”

Here the strong emphasis on the word *do* gives it a force and energy which conveys, in an irresistible manner, a most perfect knowledge of the situation of the mind of the speaker at the time. That the whole energy of the expression depends upon this seemingly insignificant word, we may be at once satisfied of by keeping it away, in this manner:—

“Excellent wretch!
Perdition catch my soul, but *I love thee*.”

How poor, how tame, how insignificant is this, when compared with the other. Here nothing remains but a tame assertion, ushered in with a pompous exclamation, which could not here be introduced with any degree of propriety. Whereas, in the way that Shakspeare has left it to us, it has an energy which nothing can surpass; for, overpowered with the irresistible force of Desdemona's charms, this strong exclamation is extorted from the soul of Othello in spite of himself. Surprised at this tender emotion, which brings to his mind all those amiable qualities for which he had so much esteemed her, and at the same time fully impressed with the firm persuasion of her guilt, he bursts out into that seemingly inconsistent exclamation,—*Excellent wretch!* and then he adds in the warmth of his surprise, thinking it a thing most astonishing that any warm affection should still remain in his breast,—he even confirms it with an oath,—*Perdition catch my soul, but I do love thee*. “In spite of all the falsehoods with which I know thou hast deceived me, in spite of all the crimes of which I know thee guilty, in spite of all those reasons for which I ought to hate thee, in spite of myself, still I find that I love, yes, I do love thee.” We look upon it as a thing altogether impossible to transmute the energy of this expression into any language whose verbs are regularly inflected.

In the same manner we might go through all the other tenses, and show that the same superiority is to be found in each. Thus, in the *perfect tense* of the Latins, instead of the simple *AMAVI*, we say *I HAVE LOVED*; and by the liberty we have of putting the emphasis upon any of the words which compose this phrase, we can in the most accurate manner fix the precise idea which we mean to excite; for, if we say, *I have loved*, with the emphasis upon the word *I*, it at once points out the person as the principal object in that phrase, and makes us naturally look for a contrast in some other person, and the other parts of the phrase become subordinate to it: “*He has loved thee much, but I have loved thee infinitely more*.” The Latins, too, as they were not prohibited from joining the pronoun with their verb, were also acquainted with this excellence, which Virgil has beautifully used in this verse:—

“*Nos patriam fugimus;*
Tu, Tityre, lentus in umbra,” &c.

We are not only enabled thus to distinguish the person in as powerful a manner as the Latins, but can also with the same facility point out any of the other circumstances as principals;

for if we say, with the emphasis upon the word *have*, “*I HAVE Language loved*,” it as naturally points out the time as the principal object, and makes us to look for a contrast in that peculiarity, *I HAVE*: “*I have loved indeed; my imagination has been led astray, my reason has been perverted; but, now that time has opened my eyes, I can smile at those imaginary distresses which once perplexed me*.” In the same manner we can put the emphasis upon the other word of the phrase, *loved*; “*I have loved*.” Here the passion is exhibited as the principal circumstance; and as this can never be excited without some object, we naturally wish to know the object of that passion, “*Who! what have you loved?*” are the natural questions we would put in this case. “*I have loved Eliza*.” In this manner we are, on all occasions, enabled to express, with the utmost precision, that particular idea which we would wish to excite, so as to give an energy and perspicuity to the language, which can never be attained by those languages whose verbs are conjugated by inflection; and if to this we add the inconvenience which all inflected languages are subject to, by having too small a number of tenses, so as to be compelled to make one word on many occasions supply the place of two, three, or even four, the balance is turned still more in our favour. Thus, in Latin, the same word, *AMABO*, stands for *shall* or *will love*, so that the reader is left to guess from the context which of the two meanings it was most likely the writer had in view. In the same manner *may* or *can love* are expressed by the same word, *AMEM*; as are also *might*, *could*, *would*, or *should love*, by the single word *AMAREM*, as we have already observed, so that the reader is left to guess which of these four meanings the writer intended to express; an ambiguity which occasions a perplexity very different from that clear precision which our language allows of, by not only pointing out the different words, but also by allowing us to put the emphasis upon any of them we please, which superadds energy and force to the precision it would have had without that assistance.

Upon the whole, therefore, after the most candid examination, we must conclude that the method of conjugating verbs by *inflection* is inferior to that which is performed by the help of *auxiliaries*; because it does not afford such a diversity of sounds, nor allow such variety in the arrangement of expression for the same thought, nor give so great distinction and precision in the meaning. It is, however, attended with one considerable advantage above the other method; for, as the words of which it is formed are necessarily of great length, and more sonorous than in the analogous languages, it admits of a more flowing harmony of expression; for the number of monosyllables in this last greatly checks that pompous dignity which naturally results from longer words. Whether this single advantage is sufficient to counterbalance all the other defects with which it is attended, is left to the judgment of the reader to determine. But we may remark before we quit the subject, that even this excellence is attended with some peculiar inconveniences, which shall be more particularly pointed out in the sequel.

But perhaps it might still be objected, that although the comparisons we have made above may be fair, and the conclusion just, with regard to the Latin and English languages, yet it does not appear clear, that on that account the method of conjugating verbs by *inflection* is inferior to that by *auxiliaries*; for, although it be allowed that the Latin language is defective in point of tenses, yet, if a language were formed which had a sufficient number of inflected tenses to answer every purpose; if it had, for instance, a word properly formed for every variation of each tense; one for *I love*, another for *I do love*; one for *I shall*, another for *I will love*; one for *I might*, another for *I could*, and *would*, and *should love*; and so on through all the other tenses; that this language would not be liable to the objections we have brought against the inflection of verbs; and that of course the objections we have brought are only valid against those languages which have followed that mode and executed it imperfectly. We answer, that although this would in some measure remedy the evil, yet it would not remove it entirely. For, in the first place, unless every verb, or every small number of verbs, were conjugated in one way, having the sound of the word in each tense, and division of tenses, as we may say, different from all the other conjugations, it would always occasion a sameness of sound, which would in some measure prevent that variety of sounds

Language. so proper for a language. And even if this could be effected, it would not give such a latitude to the expression as auxiliaries allow; for, although there should be two words, one for *I might*, and another for *I could* love, yet as these are single words, they cannot be varied; whereas, by auxiliaries, either of these can be varied twenty-four different ways, as has been shown above. In the last place, no single word can ever express all that variety of meaning which we can do by the help of our auxiliaries and the emphasis. *I have loved*, if expressed by any one word, could only denote at all times one distinct meaning; so that to give it the power of ours, three distinct words at least would be necessary. However, if all this were done; that is, if there were a distinct conjugation formed for every forty or fifty verbs; if each of the tenses were properly formed, and all of them different from every other tense as well as every other verb; and these all carried through each of the different persons, so as to be all different from one another; and if likewise there were a distinct word to mark each of the separate meanings which the same tense could be made to assume by means of the emphasis; and if all this infinite variety of words could be formed in a distinct manner, different from each other, and harmonious; this language would have powers greater than any that could be formed by auxiliaries, if it were possible for the human powers to acquire such a degree of knowledge as to be able to employ it with facility. But how could this be attained, since upwards of ten thousand words would be necessary to form the variations of any one verb, and a hundred times that number would not include the knowledge of the verbs alone of such a language?¹ How much, therefore, ought we to admire the simple perspicuity of our language, which enables us, by the proper application of ten or twelve seemingly trifling words, the meaning and use of which can be attained with the utmost ease, to express all that could be expressed by this unwieldy apparatus? What can equal the simplicity or the power of the one method, but the well-known powers of the twenty-four letters, the knowledge of which can be obtained with so much ease, whilst their powers know no limits? or, what can be compared to the fancied perfection of the other, but the transcript of it which the Chinese seem to have formed in their unintelligible language?

Having thus considered pretty fully the advantages and defects of each of these two methods of varying verbs, we cannot help feeling a secret wish arise in our mind, that there had been a people sagacious enough to have united the powers of the one method with those of the other; nor can we help being surprised, that among the changes which took place in the several languages of Europe after the downfall of the Roman monarchy, some of them did not accidentally stumble on the method of doing it. From many concurring circumstances, it seems probable that the greater part, if not all, of the Gothic nations that overran Italy at that time, had their verbs varied by the help of auxiliaries; and many of the modern European languages which have sprung from them, have so far borrowed from the Latin, as to have some of the tenses of their verbs inflected. Yet the English alone have in any instance combined the joint powers of the two, which could only be done by forming inflections for the different tenses in the same manner as the Latins, and at the same time retaining the original method of varying them by auxiliaries; by which means either the one or the other method could have been employed as occasion required. We have luckily two tenses formed in that way, the *present* of the indicative, and the aorist of the *past*. In almost all our verbs these can be declined either with or without auxiliaries. Thus the present, without an auxiliary, is, *I love, I write, I speak*; with an auxiliary, *I do write, I do love, I do speak*. In the same manner, the past tense, by inflection, is, *I loved, I wrote, I spoke*; by auxiliaries, *I did love, I did speak, I did write*. Every author who knows any thing of the power of the English language, knows the use which may be made of this distinction. What a pity is it that we should have stooped short so soon. How blind was it in many other nations to imitate the

defects without making a proper use of that beautiful language which is now numbered among the dead.

After the verbs, the next most considerable variation we find between the *analogous* and *transpositive* languages is in the nouns; the latter varying the different cases of these by *inflection*; whereas the former express all the different variations of them by the help of other words prefixed, called *prepositions*. Now, if we consider the advantages or disadvantages of either of these methods under the same heads as we have done the verbs, we shall find, that with regard to the first particular, viz., variety of sounds, almost the same remarks may be made as upon the verbs; for if we compare any particular noun by itself, the variety of sound appears much greater between the different cases in the *transpositive*, than between the translation of these in the *analogous* language. Thus *rex, regis, regi, regem, &c.*, are more distinct from one another in point of sound, than the translation of these, *a king, of a king, to a king, a king, &c.* But if we proceed one step further, and consider the variety which is produced in the language in general by the one or the other of these methods, the case is entirely reversed. For, as it would have been impossible to form distinct variations, different from one another, for each case of every noun, they have been obliged to reduce all their nouns into a few general classes, called *declensions*, and to give to all those included under each class the same termination in every case, which produces a like similarity of sound with what we already observed was occasioned to the verbs from the same cause; whereas, in the *analogous* languages, as there is no necessity for any constraint, there is almost as great a variety of sounds as there are of nouns. The Latins have only five different declensions; so that all the great number of words of this general order must be reduced to the very small diversity of sounds which these few classes admit of; and even the sounds of these few classes are not so much diversified as they might have been, as many of the different cases in the different declensions have exactly the same sounds, as we shall have occasion to remark more fully hereafter. We might here produce examples to show the great similarity of sounds between different nouns in the Latin language, and variety in the English, in the same way as we did of the verbs; but as every reader in the least acquainted with these two languages, can satisfy himself in this particular, without any further trouble than by marking down any number of Latin nouns, with their translations into English, we think it unnecessary to dwell longer on this particular.

But if the inflection of nouns is a disadvantage to a language in point of diversity of sounds, it is very much the reverse with regard to the variety it allows in the arranging the words of the phrase. Here, indeed, the *transpositive* language shines forth in all its glory, and the *analogous* must yield the palm without the smallest dispute. For as the *nominative case*, or that noun which is the cause of the energy expressed by the verb, is different from the *accusative*, or that noun upon which the energy expressed by the verb is exerted, these may be placed in any situation that the writer shall think proper, without occasioning the smallest confusion; whereas, in the *analogous* languages, as these two different states of the noun are expressed by the same word, they cannot be distinguished but by their position alone; so that the noun, which is the efficient cause, must always precede the verb, and that which is the passive subject must follow, which greatly cramps the harmonious flow of composition. Thus the Latins, without the smallest perplexity in the meaning, could say either *Brutum amavit Cassius*, or *Cassius amavit Brutum*, or *Brutum Cassius amavit*, or *Cassius Brutum amavit*. As the termination of the word *Cassius* always points out that it is in the *nominative case*, and therefore that he is the person from whom the energy proceeds; and in the same manner, as the termination of the word *Brutum* points out that it is in the *accusative case*, and consequently that he is the object upon whom the energy is exerted, the meaning continues still distinct and clear, notwithstanding all these several variations; whereas, in the Eng-

¹ This assertion may perhaps appear to many very much exaggerated; but if any one should think so, we only beg the favour that he will set himself to mark all the variations of tenses, mode, person, and number, which an English verb can be made to assume, varying each of these in every way that it will admit, both as to the diversity of expression and the emphasis, and he will soon be convinced that we have here said nothing more than enough.

Language. lish language, we could only say, *Cassius loved Brutus*, or, by a more forced phraseology, *Cassius Brutus loved*. Were we to reverse the case, as in the Latin, the meaning also would be reversed; for if we say *Brutus loved Cassius*, it is evident, that instead of being the person beloved, as before, *Brutus* now becomes the person from whom the energy proceeds, and *Cassius* becomes the object beloved. In this respect, therefore, the analogous languages are greatly inferior to the transpositive; and, indeed, it is from this single circumstance alone that they derive their chief excellence.

But although it thus appears evident that any language which has a particular variation of its nouns to distinguish the *accusative* from the *nominative case*, has an advantage over those languages which have none; yet it does not appear that any other of their *cases* adds to the variety, but rather the reverse; for in Latin we can only say *Amor Dei*; in English the same phrase may be rendered either *the love of God*, or *God the love*, or, by a more forced arrangement, *God the love of*. And as these oblique cases, as the Latins called them, except the *accusative*, are clearly distinguished from one another and from the *nominative*, by the preposition which accompanies them, we are not confined to any particular arrangement with regard to these, as with the *accusative*, but may place them in what order we please, as in Milton's elegant invocation at the beginning of *Paradise Lost* :—

“Of man's first disobedience, and the fruit
Of that forbidden tree, whose mortal taste
Brought death into the world, and all our woe,
With loss of Eden, till one greater man
Restore us, and regain the blissful seat,
Sing, heavenly muse.”

In this sentence the transposition is almost as great as the Latin language would admit of, and the meaning as distinct as if Milton had begun with the plain language of prose.

Before we leave this head, we may remark, that the little attention which seems to have been paid to this peculiar advantage, derived from the use of an *accusative case* different from the *nominative*, is somewhat surprising. The Latins, who had more occasion to attend to this with care than any other nation, and even the Greeks themselves have in many cases overlooked it, as is evident from the various instances we meet with in their languages where this is not distinguished. For all nouns of the neuter gender, both in Greek and Latin, have in every declension their *nominative* and *accusative singular* alike. Nor in the plural of such nouns is there any distinction between these two cases; and in Latin all nouns whatever of the third, fourth, and fifth declensions, of which the number is very considerable, have their *nominative* and *accusative plural* alike. So that their language reaps no advantage in this respect from almost one-half of their nouns. Nor have any of the modern languages in Europe, however much they may have borrowed from the ancient languages in other respects, attempted to copy from them in this particular; from which perhaps more advantage would have been gained, than from copying all the other supposed excellencies of their language. But to return to our object.

It remains that we consider whether the inflection of nouns gives any advantage over the method of defining them by prepositions, in point of distinctness and precision of meaning? But in this respect, too, the analogous languages must come off victorious. Indeed, this is the particular in which their greatest excellence consists; nor was it, we believe, ever disputed but that, in point of accuracy and precision, this method must excel all others, however it may be defective in other respects. We observed under this head, when speaking of verbs, that it might perhaps be possible to form a language by inflection which should be capable of as great accuracy as in the more simple order of auxiliaries; but this would have been such an infinite labour that it was not to be expected that ever human powers would have been able to accomplish it. More easy would it have been to have formed the several inflections of the nouns so different from one another as to have rendered it impossible ever to mistake the meaning. Yet even this has not been attempted. And as we find that those languages, which have adopted the method of inflecting their verbs, are more imperfect in point of precision than the other, so the same may be said of inflecting the nouns; for,

not to mention the energy which the analogous languages acquire by putting the accent upon the noun, or its preposition, when in an oblique case, according as the subject may require,—to express which variation of meaning no particular variety of words have been invented in any inflected language,—they are not even complete in other respects. The Latin, in particular, is in many cases defective, the same termination being employed in many instances for different cases of the same noun. Thus the *genitive* and *dative singular*, and *nominative* and *vocative plural*, of the first declension, are all exactly alike, and can only be distinguished from one another by the formation of the sentence; as are also the *nominative*, *vocative*, and *ablative singular*, and the *dative* and *ablative plural*. In the second, the *genitive singular* and *nominative* and *vocative plural* are the same, as are also the *dative* and *ablative singular*, and *dative* and *ablative plural*, except those in *um*, whose *nominative*, *accusative*, and *vocative singular*, and *nominative*, *accusative*, and *vocative plural*, are alike. The other three declensions agree in as many of their cases as these do, which evidently tends to perplex the meaning, unless the hearer is particularly attentive to, and well acquainted with, the particular construction of the other parts of the sentence; all of which is totally removed, and the clearest certainty exhibited at once, by the help of prepositions in the analogous languages.

It will hardly be necessary to enter into such a minute examination of the advantages or disadvantages attending the variation of *adjectives*, as it will appear evident, from what has been already said, that the endowing them with terminations similar to, and corresponding with, *substantives*, must tend still more to increase the similarity of sounds in any language, than any of those particulars we have already taken notice of; and were it not for the liberty which they have, in transpositive languages, of separating the adjective from the substantive, this must have occasioned such a jingle of similar sounds as could not fail to have been most disgusting to the ear; but as it would have been impossible in many cases, in those languages where the verbs and nouns are inflected, to have pronounced the words which ought to have followed each other, unless their adjectives could have been separated from the substantives, therefore, to remedy this inconvenience, they were forced to devise this unnatural method of inflecting them also; by which means it is easy to recognise to what substantive any adjective has a reference, in whatever part of the sentence it may be placed. In these languages, therefore, this inflection, both as to gender, number, and case, becomes absolutely necessary; and, by the diversity which it admitted in the arranging the words of the several phrases, might counterbalance the jingle of similar sounds which it introduced into the language.

Having thus examined the most striking particulars in which the transpositive and analogous languages differ, and endeavoured to show the general tendency of every one of the particulars separately, it would not be fair to dismiss the subject without considering each of these as a whole, and pointing out their general tendency in that light: for, we all know, that it often happens in human inventions, that every part which composes a whole, taken separately, may appear extremely fine; and yet, when all these parts are put together, they may not agree, but produce a jarring and confusion very different from what we might have expected. We, therefore, imagine that a few remarks upon the genius of each of these two distinct *idioms* of language, considered as a whole, will not be deemed useless.

Although all languages agree in this respect, that they are the means of conveying the ideas of one man to another, yet as there is an infinite variety of ways in which we might wish to convey these ideas, sometimes by the easy and familiar mode of conversation, and at other times by more solemn addresses to the understanding, by pompous declamation, &c., it may so happen that the genius of one language may be more properly adapted to the one of these than the other, while another language may excel in the opposite particular. This is exactly the case in the two general *idioms* of which we now treat. Every particular in a transpositive language is peculiarly calculated for that solemn dignity which is necessary for pompous orations. Long-sounding words, formed by the inflection of the different parts of speech; flowing periods, in which the

Language. attention is kept awake by the harmony of the sounds, and in expectation of that word which is to unravel the whole ; if composed by a skilful artist, are admirably suited to that solemn dignity and awful grace which constitutes the essence of a public harangue. On the contrary, in private conversation, where the mind wishes to unbend itself with ease, these become so many clogs which encumber and perplex. At these moments we wish to transfuse our thoughts with ease and facility, we are tired with every unnecessary syllable, and wish to be freed from the trouble of attention as much as may be. Like our state robes, we would wish to lay aside our pompous language, and enjoy ourselves at home with freedom and ease. Here the solemnity and windings of the *transpositive* language are burdensome, while the facility with which a sentiment can be expressed in the *analogous* language is the thing that we wish to acquire. Accordingly, in Terence and Plautus, where the beauties of dialogue are most charmingly displayed, transposition is sparingly used. In this humble, though most engaging sphere, the analogous language moves unrivalled ; in this it wishes to indulge, and never tires. But it in vain attempts to rival the *transpositive* in dignity and pomp : the number of monosyllables interrupts the flow of harmony ; and, although they may give a greater variety of sounds, yet they do not naturally possess that dignified gravity which suits the other language. This, then, must be considered as the striking particular in the genius of these two different *idioms* which marks their characters.

If we consider the effects which these two different characters of language must naturally produce upon the people who employ them, we will soon perceive that the genius of the *analogous* language is much more favourable for the most engaging purposes of life—the civilizing the human mind by mutual intercourse of thought—*than the transpositive*. For as it is chiefly by the use of speech that man is raised above the brute creation—as it is by this means he improves every faculty of his mind, and, to the observations which he may himself have made, has the additional advantage of the experience of those with whom he may converse, as well as the knowledge which the human race have acquired by the accumulated experience of all preceding ages—as it is by the enlivening glow of conversation that kindred souls catch fire from one another, that thought produces thought, and each improves upon the other, till they soar beyond the bounds which human reason, if left alone, could ever have aspired to—we must surely consider that language as the most beneficial to society which most effectually removes those bars that obstruct its progress. Now, the genius of the *analogous* languages is so easy, so simple and plain, as to be within the reach of every one who is born in the kingdom where it is used to speak it with facility ; even the rudest among the vulgar can hardly fall into any considerable grammatical errors : whereas, in the *transpositive* languages, so many rules are necessary to be attended to, and so much variation is produced in the meaning, by the slightest variations in the sound, that it requires a study far above the reach of the illiterate mechanic ever to attain. So that, how perfect soever the language may be when spoken with purity, the bulk of the nation must ever labour under the inconvenience of rudeness and inaccuracy of speech, and all the evils which this naturally produces. Accordingly, we find that in Rome a man, even in the highest rank, received as much honour, and was as much distinguished among his equals, for being able to converse with ease, as a modern author would be for writing in an easy and elegant style ; and Cæsar, among his contemporaries, was as much esteemed for his superiority in speaking the language in ordinary conversation with ease and elegance, as for his powers of oratory, his skill in arms, or his excellence in literary composition. It is needless to point out the many inconveniences which this must unavoidably produce in a state. It is sufficient to observe, that it naturally tends to introduce a vast distinction between the orders of men—to set an impenetrable barrier between those born in a high and those born in a low station—to keep the latter in ignorance and barbarity, while it elevates the former to such a height as must subject the other to be easily led by every popular demagogue. How far the history of the nations who have followed this *idiom* of language confirms this observation, every one is left to judge for himself.

[The first stage of language exhibits single words, chiefly Language. nouns or verbs, in a short form, and with a *minimum* amount of inflection, some subordinate to the others, *but still separate words*. The Chinese is usually considered to be the type of language in this state.]

In the second, the subordinate words coalesce with the main ones, but not so as to wholly conceal their originally separate existence. Languages in this state are called *agglutinate*. This is the state in which most of the languages of the world exist. The Mantshu and Mongol are the usual examples of this condition. Most other tongues, however, would serve as well.

The coalition of the subordinate with the main word having become so perfect as for the former to look like a part of the latter rather than a word originally separate, the combination becomes *amalgamate* instead of *agglutinate*, and the language *inflectional*. The Greek and Latin are the types of this form.

Inflections fall off, and get displaced by separate words, these words being of a peculiar kind—propositions with substantives, auxiliaries with verbs. The English is in this stage, and, doubtless, it is destined to further changes.

These, however, will not be in a cycle. It is only in appearance that the fourth stage is in the same predicament as the first. It is only in the comparative absence of inflections, and the separate existence of the subordinate parts of sentences, that they agree. The subordinate words themselves differ.

An English auxiliary, or proposition, in its more typical form, is meaningless when taken by itself. In *I have ridden a horse*, the word *have* originally meant, *I possess a horse as a ridden thing* ; where, however, is the idea of possession in *I have been*, a sentence exhibiting language in the most abstract or supra-sensible form in which it has ever existed ?

In the difference of character between the subordinate words of sentences, we have a means of ascertaining whether languages in the same non-inflectional state have lost their inflection, or have yet to develop them. The question, however, is not asked so often as it ought to be.

In the actual field of language the lines of demarcation are less definitely marked than in the preceding sketch. The phenomena of *growth*, however, are, upon the whole, what it suggests.

That languages like the English, French, &c., are more advanced, grown, or developed, than the classical tongues, is certain, whatever may be the interpretation of the fact in a question as to the relative values of the different stages.—R. G. L.]

II.—AFFINITIES OF LANGUAGE.

The study of the affinities of various languages is so far one of the most important of all branches of human knowledge, as it affords, when properly applied, an unerring test of the truth or falsehood of historical evidence, without which it would sometimes be impossible to unravel the mysteries of contradictory testimonies, respecting the relations of the different races of mankind. We have, for example, no traditional evidence in support of any connection between the ancient Egyptians and the Indians ; whilst, on the other hand, a number of persons who came with the English army from the East Indies into Egypt, were so strongly impressed with the resemblance of the Egyptian and Indian temples, which appeared even to excite the religious feelings of many of the natives who were amongst the troops employed, that a very general inclination has arisen from these circumstances to consider the Egyptian mythology as merely a branch of the Indian. But if the Egyptian people had really been of Indian origin—that is, if the Egyptians and Indians had really been one people, at any later period than that at which the whole of the Indian and European races were separated from their common stock—the languages of India and of Egypt could not but have exhibited some features of resemblance, which would have preserved the traces of the connection ; whilst, in fact, there is much less similarity between the Egyptian and the Indian, than between the Indian and the Greek, or the English and the Persian ; so that etymology may here be adduced as confirming the evidence, or as justifying the silence, of history ; and the resemblance of the mythological representations must be considered as in great measure accidental.

Language. [Similarity of language is strong *prima facie* evidence in favour of a common origin; but it is nothing more. The strongest instances of a mother-tongue having become forgotten or unlearned, and a new language adopted in its stead, are to be found amongst the negroes of the New World. In St Domingo, the languages are French and Spanish; in the United States, English; and in South America, Dutch, Spanish, and Portuguese. Here, however, the conditions were peculiar. The native language was no longer connected with the soil to which it was indigenous, but transplanted to a new area. Neither was it any single homogeneous form of speech that was obliterated, but, on the contrary, a multitude of mutually unintelligible tongues, which, under any circumstances, would have ended in the establishment of a *Lingua Franca*.

With the negro languages of the New World we have the *maximum* amount of change in speech with a *minimum* in the way of intermixture of blood. With the native American tribes, the phenomena of change are somewhat different. As a general rule, the number of individuals who speak one and the same language is remarkably small; every now and then, however, in contact with these small patches of speech, is to be found some language spread over a considerable area, and spoken by several tribes. These the missionaries have converted into *Lingua Francas*; it being a matter of observation that an American Indian learns an American language, no matter how unlike his own, easier than one from Europe. Many of the minor languages of the South American republics and Brazil have thus been replaced by the Guarani.

In each of the previous cases, there is the actual replacement of one language by another. In the *Lingua Franca* of Europe this is not always the case. In the Levant, the Italian (the *Lingua Franca*, or its basis) is spoken by numerous Arabs, Greeks, &c. The native Arabic, however, and the native Greek, co-exist by the side of it. There is no extinction as yet. Nevertheless, the tendencies towards it have set, inasmuch as where two languages have to be learned, the less useful is the weakest, and has a chance of going to the wall.

Sometimes with two languages thus brought in contact with each other, we have the phenomenon of intermixture, rather than obliteration—an intermediate tongue being formed out of the fusion of two. *A priori*, it seems likely that such should be the case often. In reality, however, the development of such a language as (say) C, out of languages A and B, is very rare indeed. The ordinary phenomenon is A with a certain amount of B, or B with a certain amount of A—the original character of the fundamental language being preserved. The English (for instance), for all its Latin elements, is German; the French, for all its German elements, Latin.

This suggests, that in language we have every degree of change, from simple intermixture to absolute obliteration and replacement. It also suggests, that similarity of language is a matter of degree. There may be absolutely community of tongue, or there may be an admixture of say *one per cent.* of foreign terms. Language is one of those signs of community of origin which is slow to be abolished—slower than most others—slower, perhaps (on the whole), than any other; nevertheless, it is only a sign, and a sign capable of obliteration. Its relative permanence, when compared with other *criteria*, is a matter upon which there is a wide discrepancy of opinion; the facts upon which our hypotheses must rest being by no means easily ascertained. It is only certain that the questions involved in it are far too complicated to be disposed of by the application of any general rule. As new ideas are introduced, language changes. As new physical influences are brought into action, the anatomical conformation of the human body becomes modified. That these latter forces have some influence is universally admitted; though many competent authorities put a close limit on its extent. It is clear, however, that, within certain limits, both language and physical conformation may change.

They may change at different rates—*i.e.*, in a given period (say ten generations), the speech may be considerably modified, whilst the anatomy of the speakers remains the same. And, *vice versa*, the physiognomies may alter, whilst language remains fixed. Every comparison of the difference of rate between such changes should be made on the merits of the particular question under notice, no general rule being sufficient.

Next comes the question of *limit*. Here we may safely say,

that the range of change in language is wider than that of Language. which physical form is susceptible. It is, clearly, easier for a negro to be converted into a Frenchman in the matter of language, than in that of colour. Extreme forms of language may more easily be converted into each other, than extreme forms of physical conformation; and this is all that can safely be said. It is by no means certain that a population of negroes, transplanted from a low alluvial swamp to an elevated mountain range, would not retain their language without alteration, than they would their physical form—*within certain limits*.

The contact of two languages has a greater tendency to effect the obliteration of one of them than the development of a *tertium quid* out of their fusion.

The contact of different stocks in the way of physical union has a greater tendency to effect the intermixture of blood than the obliteration of one of the constituent elements.

From this it follows, that languages are much more *either one thing or another* than stocks, races, or families. The language of Radnorshire and Cornwall is much more English (as opposed to Welsh) than the blood or pedigree of its speakers is English; indeed, as a general rule, the blood of a given population is more mixed than its language. This is because, whilst A and B, in the way of stock, blood, or pedigree, will give C (a true *tertium quid*, or a near approach to it), A and B, in the way of language, will only give themselves,—*i.e.*, they will give no true *tertium quid*, nor any very close approach to it. These, however, are matters that belong to the question of *man* in general rather than to language. Language (as an instrument of criticism in ethnology) is the most permanent of the *criteria* of human relationship derivable from our *moral* constitution, and, in some cases, equally permanent with physical form, though, in the case of extreme changes, less so.

The particular illustration of the original text to which this notice is a comment, drawn from the languages of India and Egypt, is exceptionable. The languages of India are *two* in number. Of these it is only one, the Sanscrit, that is more Persian, &c., than Egyptian. Of the other, the Tamul, &c., no such statement can be made. It is, probably, more Egyptian than Persian—certainly more Egyptian than Greek or English.—R. G. L.]

It is, however, only with regard to the languages of the ancient world that we can feel much interest in such an investigation. The American dialects might afford equally extensive subjects of speculation in a metaphysical and critical point of view; but the concerns of barbarians, unconnected and remote from all contact with literature or civilization, and destitute of all historical records, will scarcely be thought to require any great portion of attention from a philosophical inquirer; and there is ample scope for the employment of all our faculties in the analysis and comparison of the various languages of Europe, Asia, and Africa. If, indeed, an extraordinary exertion of enterprise and industry, which can be expected from a few distinguished individuals only in the course of as many centuries, should make known relations, such as Alexander von Humboldt has appeared to discover, between the American and Asiatic nations, a new field would be opened for the gratification of our curiosity; but it can scarcely be expected that these points of resemblance can be sufficiently numerous to afford any thing like demonstrative evidence, until the whole subject has been much more deeply and repeatedly discussed. In the mean time, a very brief enumeration of the names of the American languages is all that can be required, on an occasion like the present; except the insulated though interesting remark, that the countries separated by Behring's Straits exhibit, as might indeed be expected, strong resemblances in some of their languages.

[It is in the *runder* languages that the important phenomena of development and growth—the laws of language—are best studied. The following extracts are from an opuscle of the writer on the subject:—

"A little consideration will show, that that difference between the study of a given subject in its general and abstract, and the study of one in its applied or concrete form, which finds place in so many departments of human knowledge, finds place in respect to language and languages. It finds place in the subject before us as truly as it does in the science of the laws of life—physiology or biology. Just as there is therein a certain series of laws relating to life and organization, which

Language. would command our attention, if the whole animal and vegetable world consisted of but a single species, so the study of speech would find space in a well-devised system of education, even if the tongues of the whole wide world were reduced to a single language, and that language to a single dialect. This is because the science of life is one thing, the science of the forms under which the phenomena of life are manifested, another. And just as physiology, or biology, is, more or less, anterior to, and independent of, such departments of study as botany and zoology, so, in the subject under notice, there is the double division of the study of *language* in respect to structure and development, and the study of *languages* as instances of the variety of form in which the phenomenon of human speech exhibits, or has exhibited, itself. Thus—

“When (as I believe once to have been the case) there was but a single language on the face of the earth, the former of these divisions had its subject-matter. And—

“When (as is by no means improbable) one paramount and exclusive tongue, developed, at first, rapidly and at the expense of the smaller languages of the world, and, subsequently, slowly and at that of the more widely-diffused ones, shall have replaced the still numerous tongues of the nineteenth century, and when all the dialects of the world shall be merged into one universal language, the same subject-matter for the study of the structure of language, its growth and changes, will still exist.

“So that the study of language is one thing, the study of languages another.

“One main distinction between the study of language and the study of languages lies in the fact of the value of the former being *constant*, that of the latter *fluctuating*. The relative importance of any two languages, as objects of special attention, scarcely ever remains steady. The value, for instance, of the German—to look amongst the cotemporary forms of speech—has notably risen within the present century. And why? Because the literature in which it is embodied has improved. Because the scientific knowledge which, to all who want the key, is (so to say) locked up in it, has increased some hundred per cent.

“But it may go down again. Suppose, for instance, that new writers of pre-eminent merit ennoble some of the minor languages of Europe—the Danish, Swedish, Dutch, &c. Such a fact would divide the attention of *savans*—attention which can only be bestowed upon some second, at the expense of some first, object. In such a case, the extent to which the German language got studied would be affected much in the same way as that of the French was by the development of the literature of Germany.

“Or the area over which a language is spoken may increase, as it may also diminish.

“Or the number of individuals that speak it may multiply—the area being the same.

“Or the special application of the language, whether for the purposes of commerce, literature, science, or politics, may become changed. In this way, as well as in others, the English is becoming, day by day, more important.

“There are other influences.

“High as is the value of the great classical languages of Greece and Rome, we can easily conceive how that value might be enhanced. Let a manuscript containing the works of some of the lost, or imperfectly preserved, writers of antiquity be discovered. Let, for instance, Gibbon's *desiderata*—the lost *Decads of Livy*, the *Orations of Hyperides*, or the *Dramas of Menander*—be made good; the per-centage of classical scholars would increase, little or much.

“Some years back it was announced that the *Armenian* language contained translations, made during the earlier centuries of our era, of certain classical and ecclesiastical writings, of which the originals had been lost—lost in the interval. This did not exactly make the *Armenian*, with its alphabet of six-and-thirty letters, a popular tongue; but it made it, by a fraction, more popular than it was in the days of Whiston and La Croze, when those two alone, of all the learned men of Europe, could read it.

“Translations tell in another way. Whatever is worth reading in the Danish and Swedish is forthwith translated into German. *E.g.*, Professor Retzius of Stockholm wrote a good Manual of Anatomy. He had the satisfaction of seeing it translated into German. He had the further satisfaction of

hearing that the translation ran through five editions in less time than the original did through one.

“Now, if the Germans were to leave off translating, the value of the language in which Professor Retzius wrote his Anatomy would rise.

“Upon the whole, the French is, perhaps, the most important language of the nineteenth century; yet it is only where we take into consideration the whole of its elements of value.

“To certain special *savans*, the German is worth more; to the artist, the Italian; to the American, the Spanish. It fell, too, in value, when nations like our own insisted upon the use of their native tongues in diplomacy. It fell in value because it became less indispensable; and another cause, now in operation, affects the same element of indispensability. The French are beginning to learn the languages of other nations. Their own literature will certainly be none the worse for their so doing. But it by no means follows that that literature will be any the more studied; on the contrary, Frenchmen will learn English more, and, *pro tanto*, Englishmen learn French less.

* * * * *
“What is the import of such sounds as that of the letter *s* in the word father-*s*? It is the sign of the plural number.

“Such is the question—such the answer. But is the answer a real one? Is it an answer at all? How come such things as plural numbers, and signs of plural numbers, into language? How the particular plural before us came into being, I cannot say; but I can show how *some* plurals have. Let us explain the following—

Ngi = I.	Ngi-n-de = We.
Ngo = Thou.	Ngo-n-da = Ye.
Ngu = He.	Nge-n-da = They.
	Da = With.

The *da* (or *de*) in the second column is the sign of the plural number in a language which shall at present be nameless. It is also the preposition *with*. Now *with* denotes association; association, *plurality*. Hence

Ngi - n - de = I	+	= We.
Ngo - n - da = Thou	+	= Ye.
Nge - n - da = He	+	= They.

This is just as if the Latins, instead of *nos* and *vos*, said *me-cum* and *te-cum*.

“Such is the history of one mode of expressing the idea of plurality; we can scarcely say of a *plural number*. The words *plural number* suggest the idea of a single word, like *fathers*, where the *s* is inseparably connected with the root, at least so far inseparably connected as to have no independent existence of its own. *Ngi-n-de*, however, is no single word at all, but a pair of words in juxtaposition, each with a separate existence of its own. But what if this juxtaposition grow into *amalgamation*? What if the form in *da* change? What if it become *t* or *z*, or *th*, or *s*? What if, meanwhile, the separate preposition *da* change in form also; in form or meaning, or perhaps in both? In such a case a true plural form is evolved, the history of its evolution being a mystery.

“So much for one of the inflections of a *noun*. The remaining words illustrate one of a *verb*.

“Hundreds of grammarians have suggested that the signs of the *persons* in the verb might be neither more nor less than the personal pronouns *appended*, in the first instance, to the verb, but afterwards amalgamated or incorporated with it. If so, the *-m* in *inquam* is the *m* in *me*, &c. The late Mr Garnett, a comparative philologist whose reputation is far below his merits, saw that this was not exactly the case. He observed that the appended pronoun was not so much *Personal Possessive*; that the analysis of a word like *inquam* was not so much, *say + I*, as *saying + my*; in short, that the verb was a noun, and the pronoun either an adjective (like *meus*) or an oblique case (like *mei*), agreeing with or governed by it.

“It is *certainly* so in some cases. In a language which, at present, shall be nameless, instead of saying *my apple*, *thy apple*, they say what is equivalent to *apple-m*, *apple-th*, &c. —*i.e.*, they append the possessive pronoun to the substantive, and by modifying its form, partially incorporate or amalgamate it. They do more than this. They do precisely the same with the verbs in their *personal* as they do with the nouns in their

Language. *possessive* relations. Hence, *olvas-om*, &c., is less *I read* than *my-reading*; less *read + I*, than *reading + my*.

i.
Olvas—om = *I read*.
od = *Thou readest*.
uk = *We read*.
atok = *Ye read*.

ii.
Alma—m = *My apple*.
d = *Thy apple*.
nk = *Our apple*.
tok = *Your apple*.

"I submit, that facts of this kind are of some value, great or small. But the facts themselves are not all. How were they got at? They were got at by dealing with the phenomena of language as we found them, by an induction of no ordinary width and compass; and many forms of speech had to be investigated before the facts came out in their best and most satisfactory form.

"The illustration of the verb (*olvasom*, and *almam*, &c.) is from the Hungarian; that of the plural number (*nginde*, &c.), from the Tumali—the Tumali being a language no nearer than the negro districts to the South of Cordovan, between Sennaar and Darfur, and (as such) not exactly in the highway of literature and philology." (*Lecture on the Importance of the Study of Language as a Branch of Education for all Classes*, by Robert Gordon Latham, M.D., F.R.S.)

Of language in general we do not here intend to treat, but merely of languages as they are distinct from each other. It is not, however, very easy to say what the definition ought to be that should constitute a separate language; but it seems most natural to call those languages distinct, of which the one cannot be understood by common persons in the habit of speaking the other, so that an interpreter would be required for communication between persons of the respective nations. Still, however, it may remain doubtful whether the Danes and the Swedes could not, in general, understand each other tolerably well, and whether the Scottish Highlanders and the Irish would be able to drink their whisky together without an interpreter; nor is it possible to say, if the twenty ways of pronouncing the sounds belonging to the Chinese characters, ought or ought not to be considered as so many languages or dialects, though they would render all oral intercourse between the persons so speaking the language actually impracticable. But, whether we call such variations different languages, or different dialects, or merely different pronunciations of the same dialect, it is obvious that they ought all to be noticed in a complete history of languages; and, at the same time, that the languages so nearly allied must stand next to each other in a symmetrical order; the perfection of which would be, to place those languages nearest together in which the number of coincidences in the signification of words throughout the language are the most numerous.

It has sometimes been imagined, that all languages in existence present something like a trace of having been deduced from a common origin; and it would be difficult to confute this opinion by very positive evidence, unless every separate language had been very completely analysed and examined by a person well acquainted with a variety of other languages, with which it might be compared. But, without such an examination, the opinion must remain conjectural only, and no more admissible as demonstrated, than the opinions of some empirics, that there is only one disease, and that the only remedy for it is brandy. In an essay on probabilities, lately published in the *Philosophical Transactions*, Dr Young has remarked, that "nothing whatever could be inferred, with respect to the relation of two languages, from the coincidence of the sense of any single word in both of them," that is, supposing the same simple and limited combinations of sounds to occur in both, but to be applied accidentally to the same number of objects, without any common links of connection; "and that the odds would only be three to one against the agreement of two words, but if three words appeared to be identical, it would be more than ten to one that they must be derived, in both cases, from some parent language, or introduced in some other manner," from a common source; whilst "six words would

give near 1700 chances to one, and eight near 100,000; so Language. that, in these last cases, the evidence would be little short of absolute certainty."

[Few applications of mathematical reasoning to questions beyond its usual field, have commanded more attention than this calculation of Dr Young's, under whose name it is quoted in most works that support the doctrine of the fundamental unity of languages. Its scientific appearance has, doubtless, recommended it. It is exceptionable, however, on the score of its only meeting one out of the several causes of similarity of meaning accompanied with similarity of form in different languages. It only deals with the coincidences referable to chance or accident; of these, however, no advanced philologue takes any account either way; indeed, it is probable that an advocate of the unity of language might allow his opponent some dozen or scores of similar words in different languages, without either drawing any inference in favour of his own views himself, or expecting from his adversary any anticipation of any argument whatever founded upon them. The simple question of chance in language has ceased to be one of any importance. The really important question is one of the kind to which the chapter in Mill's *Logic*, on what the author calls the Collocation of Causes, has given prominence. Here a variety of causes may end in the same effect. Nowhere is this commoner than in language. Let two sounds have a tendency to change into a third—say *m* and *b* into *v*, and the combination *van* may come out of *ban* and *man* equally. The field of language is full of instances of this kind. Then there are the words that resemble one another, independent of imitation, either from being *onomatopæic*, or imitative of certain sounds, or organically connected, *i.e.*, referable to a tendency to express certain ideas by certain combinations. Certain ideas come earlier than others; so does the capability of pronouncing certain sounds. The former will naturally be represented by the latter. The sound of *r*, which comes late, is not likely to enter into the child's name of his *papa* or *mama*—ideas expressed, half the world over, by the same sounds. In the investigation of the laws by which the articulate sounds are distributed over the different languages of the world little has been done. In many cases, however, the sounds (*r*, *th*, &c.) that children learn last, are those that the ruder languages most want.—R. G. L.]

The author of the article in the *Quarterly Review*, on Adelung's *Mithridates*, observes, that, setting out from the establishment of a certain number of separate languages as species, "we may proceed to comprehend, in the description of one family, such as have more coincidences with each other than diversities, and to refer to the same class such families as exhibit any coincidences at all that are not fortuitous, imitative," that is, from *onomatopæia*, "or adoptive. In order, however, to avoid too great a number of classes, which would arise from an inadequate comparison of languages imperfectly known, it may be proper, in some cases, to adopt a geographical distinction, as sufficient to define the limits of a class, or to assist in its subdivision into orders. We are thus obliged to employ an arrangement of a mixed nature;" and, in fact, the tests of affinity here proposed depend so much on the progress of our knowledge in the study of each language, that the results must unavoidably be liable to great uncertainty and fluctuation, of that we can reasonably expect nothing more than an approximation to an arrangement completely methodical.

"If," continues the reviewer, "the resemblance or identity of a single word, in two languages, supposed to be exempt from the effects of all later intercourse, were to be esteemed a sufficient proof of their having been derived from a common stock, it would follow, that more than half the languages of the universe would exhibit traces of such connection, in whatever order we might pursue the comparison. Thus we find in a very great number, and perhaps in a majority of known languages, that the sound of the vowel *a*, with a labial consonant, is employed for the name of *Father*; and if this be supposed to be something like an *onomatopæia*, or an application of the first sounds which an infant naturally utters, the same reason cannot possibly be assigned for the still more general occurrence of the combination *nm* in the term *name*, which is by no means likely to have originated from any natural association of this kind. But neither these points of resemblance,

Language. nor any other that can be assigned, are absolutely universal; for, besides the numberless varieties referrible more or less immediately to *Abba, Father*, we have at least twenty different and independent terms for the same relation in the old world; "*Tia, Issa, Plar, Hair, Rama, Diam, Bina, Kettem, Assainalagi, Medua, Thewes, Sink, Iot, Anathien, Messee, Indaa, Nu, Nam, Monung, Dengabey, Ray, Tikkob, and Oa*; and about as many for *Name*, besides those languages in which the version of an abstract term of this kind is less likely to have been ascertained; *Ming, Tren, Diant, Sheu, Hessa, Shem, Tsarship, Ad, Nipta, Lum, Sacheli, Assia, Wasta, Ngala, Taira, Sunna, Ran, Hhili, Ding, Dbai, and Anghara*. "At the same time, therefore, that we venerate the traces of our common descent from a single pair, wherever they are still perceptible, we must not expect to find them in all existing languages without exception; and an *Etymological Universale*, considered as intended to establish such a perfect community of derivation, can only be regarded as a visionary undertaking. Nor must we neglect to unite, in some common arrangement of classification, those languages which have the words here specified, or any other radical words, in common, as incomparably more related to each other than the Chinese to the Cantabrian, or the Irish to the Hottentot.

"The gradations by which a language is likely to vary in a given time, seem to be in some measure dependent on the degree of cultivation of the language, and of the civilization of the people employing it. From Homer to the Byzantine historians, the Greek language remained essentially the same for 2000 years; the German has varied but little in 1500; and even the English, notwithstanding its mixture with French and Latin, has altered but three radical words out of the fifty-four which constitute the Lord's Prayer, in the same period. On the other hand, a few barbarians in the neighbourhood of Mount Caucasus and of the Caspian Sea, of modern origin, and ignorant of the art of writing, are divided into more nations speaking peculiar languages, radically different from each other, than the whole of civilized Europe. In such cases, little light can be thrown upon history by etymological researches; while, with regard to more cultivated nations, we obtain, from the examination of their languages, historical evidence of such a nature as it is scarcely possible for either accident or design to have falsified."

[The study of the rate at which languages change must begin with the history of those tongues which we know in more stages than one. These are few in number; being only those which are cultivated and written. In the fact of their being known in one form only (combined with the absence of a literature) lies the true reason for comparative unimportance of the ruder languages. As *languages*—i.e., as *data* for the natural history of speech—they are valuable, as they are as instruments of ethnological criticism.

Amongst the languages known to us in more stages than one, the classical languages are the chief; next to these the Hebrew, Sanskrit, Arabic, Old Slavonic, Anglo-Saxon, &c. Up to the present time they have told us, over and above the fact, that languages change at different rates, the more important one, that they change after the same fashion or upon the same principle. The Romaic differs from the ancient Greek; the Italian, &c., from the Latin; the English from the Anglo-Saxon; the Danish from the Icelandic; all in the same way—i.e., in the use of prepositions and auxiliary verbs instead of cases and moods and tenses.

This means that certain parts have a tendency to change in a definite manner. Further researches will show that they generally change in the same order, e.g., the sign of a dative case will go before that of a genitive, &c.

Hence, there is not only a question of *parts changed*, but also that of the *order* and *rate* of change; and, lastly, that of the *forces* that regulate this rate. They are somewhat different from those indicated in the text, the influence of writing and cultivation being less than is usually imagined. What they are in detail, however, has yet to be investigated.

The best exhibition of the transition of a language from one stage to another, is to be found in Petersen's History of the break-up of the Icelandic, or old Scandinavian language, into the modern tongues of Denmark, Norway, and Sweden. His facts appertaining to rate are interesting. The Danish is generally about a century in advance of the Swedish—i.e., the

Swedish of A.D. 1300, or A.D. 1800, is as archaic as the Danish Language of A.D. 1200, or A.D. 1700; the Danish of 1600 being, there or thereabouts, of the form of the Swedish of 1700.

So much for the regularity of relation between these two. Turn from them to the Norwegian. Up to the time of the Reformation it hardly changed at all; afterwards it changes in about one century as much as the other two tongues had in four.—R. G. L.]

According to the supposition of Professor Adelung, it seems not improbable that Thibet, on the E. of Cashmere, may "have been the habitation of Adam immediately after his fall, and the country occupied by the descendants of Cain. In Thibet, and in the countries immediately beyond it, the languages of at least a hundred and fifty millions of people are still principally *monosyllabic*; and from this peculiarity, as well as from the singular simplicity of their structure, they are supposed to constitute the most ancient class of existing languages, though it must be confessed that much of Adelung's reasoning on this subject is extremely inconclusive." Mr Townsend remarks very judiciously, that one of the canons of Rudbeck is by no means admissible. He states, that a language which has numerous monosyllabic expressions is a parent language. The English has more than 3700 monosyllabic expressions, and the Chinese has none but such; yet neither of them is, for that reason, to be considered as a parent language. Certain it is, that all languages, by abbreviations, have a tendency to become monosyllabic, and therefore a language which abounds in monosyllables is ancient, and these commonly are the most antiquated parts of every language. New compounds are incessantly created. These are abbreviated, and in process of time become monosyllabic. In deriving, therefore, a word in one language from its correspondent expression in some other language, we must ever bear in mind, that, unless in the formation of new compounds, the least abbreviated is commonly the parent, and the most abbreviated its offspring. Would it be possible for any one to persuade us that *Colaphus* was derived from *Cuff*, or *Blaspheme* from *Blame*? "A similar instance," says the reviewer, "might be found in *Trachelos* and *Hals* of the Greeks and Germans; for certainly *Hals* is more like *Trachelos* than like *Collum*."

[Monosyllabism is one thing: the want of inflection is another. Wherever there is a want of inflection, there is the word in its simpler form—i.e., a root *minus* any adjuncts. Without this absence of adjuncts, there is but little chance of words being monosyllabic. It may occur, however, and yet leave the roots dissyllabic or even polysyllabic—since there is no necessity for its being limited to one syllable; though such is, generally, the case. On the contrary, inflections may coalesce with the root, and so exist without increasing the number of syllables. *Dogs* is as much a monosyllable as *dog*.

Referring to what has been said about loss and non-development in the way of inflection, let us ask whether, assuming a language to be in its first stage, it is therefore a parent language? No. It has simply changed more slowly than others.

This leads to see that the word *old* has two meanings.

The English of America is, in one sense, older than the English of Australia. It separated earlier from the parent tongue.

Yet it may not be the oldest one thousand years hence. Suppose the Australian, by changing the slower, preserves more old forms. In that sense it will be the older language.—R. G. L.]

The Chinese, however, which is the principal, and probably the most ancient, of the monosyllabic languages, is distinguished from almost all others by a more marked peculiarity, which is, that its written characters, instead of depicting sounds, are the immediate symbols of the objects or ideas, and are even imperfectly represented by the sounds, whatever difference of accent or tone may be exhibited by the most refined speaker; as indeed it may happen accidentally in our own language, that we may be at a loss to explain, without circumlocution, whether we mean to say *Son* or *Sun*; *Beer* or *Bier*; *Bear* or *Bare*; *You*, *Ewe*, *Yew*, or *U*; but in the Chinese, the real cause of this essential characteristic appears to be, that the symbol was in fact originally intended as a hieroglyphic or picture of the object, though the resemblance, coarse as it probably was at first, has been generally altogether lost by the

Language. modifications which the character has conventually undergone. And in this point of view the Chinese would require to be classed with the old Egyptian only, since we know of no other language which was habitually expressed in hieroglyphics and their immediate derivatives. It is not at all uncommon for the same sound in Coptic, as in Chinese, to have four or five senses all essentially different, as may easily be observed in turning over a dictionary; *moov*, for instance, means *Bad*, and *Them*, and a *Shower*, in two verses of St Matthew (v. 45, 46), and perhaps several other things.

[This is chiefly a question of writing, not one of speaking; a question concerning the representation of language, not language itself. In the importance of the accent we recognise a point of speech; and it indicates poverty of vocabulary; but the expression of it is wholly a matter of orthography. In the history of the alphabet, the peculiarities of Egypt and China find place; not in the history of language.—R. G. L.]

Another ancient and extensive class of languages, united by a greater number of resemblances than can well be altogether accidental, may be denominated the *Indo-European*, comprehending the Indian, the West Asiatic, and almost all the European languages. If we chose to assign a geographical situation to the common parent of this class, we should place it to the south and west of the supposed origin of the human race; leaving the north for our third class, which we can only define as including all the Asiatic and European languages not belonging to the two former; which may be called *Atactic*, or, perhaps, without much impropriety, *TATARIC*; and which may be subdivided into five orders, *Sporadic*, *Caucasian*, *Tartarian*, *Siberian*, and *Insular*. The *African* and *American* languages will constitute a fourth and fifth class, sufficiently distinct from all the rest, but not intended to be considered as any otherwise united among themselves, than by their geographical situation. There is, indeed, little doubt, that some of the languages here called Tataric are essentially allied to others, which are referred to the Indo-European class; but they have been too little investigated to allow us to make the selection that would be required for completing the classification. [The extent to which this classification is accurate or inaccurate will be seen in the sequel.—R. G. L.]

The following tables are copied, with considerable additions, from Adelung's *Mithridates*. The words *Heaven* and *Earth* are chosen as specimens, because they seem to be known in a greater number of languages than any others, except the name of *Father*, which is supposed to exhibit, in some cases, a fallacious similarity. The German orthography has been principally employed, except in such languages as are usually written in the Roman characters, the pronunciation of the consonants being more uniform than in English, and that of the vowels differing little from the Italian.

[The selection of words representative of rude and unknown languages, has commanded no small amount of the attention of philologues and ethnologists; and many lists, ready prepared, are in circulation—in India and North America more especially. They are none of them unexceptionable; and the reason for their being so lies in the fact of the choice being made on *a priori* views of what words are fundamental and what not. Actual observation tells us, that the most permanent parts of languages are by no means the words that *a priori* speculations indicate.

Among the best words for specimens are the names for *fire*, *water*, *sun*, *moon*, and *star*. *Man* and *woman* are generally ambiguous, the names for them being often the names for *man* and *wife* as well. Hence, unless we have the terms for all four (*man*, *husband*, *woman*, *wife*), we have but half the requisite information. It may also be added, that along with the name for *sun*, the names for *sky* (*heaven*), *light* and *day*, should be given.

The numerals are always of value, because, whether they be of little or great use for the purposes of comparative philology, they have always a value in the history of the arithmetic. Their pure and proper philological importance, however, is inconstant. Sometimes the numerals of two or more languages shall be alike whilst the rest of the vocabulary differs. Sometimes the similitude between the words other than numeral shall be great, the numerals themselves being unlike. In many languages it happens, that if some of the numerals are alike, the others will be so also. In others, on the contrary, it by no

means follows that because (say *one* and *two* are alike, *three* and *four*, &c., should be equally so. As a class, the names of the parts of the human body are, perhaps, the best.—R. G. L.]

ASSES, Orders, and Families of LANGUAGES.

- I. MONOSYLLABIC.
 1. China.
 2. Siamese
 3. Avanes
 4. Tibetan
 - (3.) Tartarian.
 27. Turco-Tartarian
 28. Mantshuric
 29. Tungusic
 - (4.) Siberian.
 30. Permian
 31. Wogulic
 32. Ostiak
 33. Tsheremissic
 34. Morduin
 35. Teptjerai
 36. Samoedic
 37. Camashic
 38. Jeniseiostiak
 39. Jukadshiric
 40. Koriak
 41. Kamtschatkan
 - (5.) Insular.
 42. Kurilee
 43. Eastern Islands
 44. Japanese
 45. Leu Cheu
 46. Formosan
 47. Philippine
 48. New Holland, E.
 49. Van Diemen's
 50. New Caledonian
 51. New Zealand
 52. Easter Island
- II. INDO-EUROPEAN.
 5. Sanskrit
 6. Median
 7. Arabian
 8. Lycian
 9. Phrygian
 10. Greek
 11. German
 12. Celtic
 13. Etruscan
 14. Latin
 15. Cantabrian
 16. Sclavic
- III. TATARIC
 - (1.) Sporadic.
 17. Tshitic.
 18. Hinduish
 19. Magyar
 - (2.) Caucasian.
 20. Armenian
 21. Georgian
 22. Abassan
 23. Circassian
 24. Ossetish
 25. Kistic
 26. Mesgian
- IV. AFRICAN.
- V. AMERICAN.

FAMILIES, Species, or Distinct Languages, and Varieties of Dialects, with Specimens.

I. MONOSYLLABIC CLASS.

	Heaven, Sky.	Earth.
1. CHINESE	Tien, Li	Ti, To
	Fo Kien	Tshio
	Tonquinese	Thien, Bloi
	(Man, Phu chai)	Dat, Diä
2. SIAMESE	Sa wang	Din
	(Man, Pho chai;	
	Hand, Mu)	
3. AVANESE	Mo kaun, Nip ban	Lu pu, Mié
	Peguan	La pri? Tre
	Rukheng	
4. TIBETAN	(Man, Lu; Hand,	
	Nam kheh	[Lak] Dshik ten, Sa

II. INDO-EUROPEAN CLASS.

5. SANSKRIT	Paramandale, Vana, Bumi, Stira	
	Aagaska, Svarga,	
	Veigunda, Artha-	
	loga, Nibu (Man,	
	Purusha)	
	Saggó (Man, Pariso)	
	Saggó (Man, Burut-	
	sa)	
	Ardwa, Arthaloga	Buma
	Prakrit	
	Bali	
	Devanagri	
	Nepal	
	Assam	
	Tiperah	
	Kassai	
	Bengalee	
	Hindee	
	Urdu	
	Brijbasea	
	Jypura	
	Hindustanee	
	Moors	
	Asmaan, Mukuti	Sjmién Dshiamín,
		Dunia

LANGUAGE.

Language.	Heaven, Sky.	Earth.	Heaven, Sky.	Earth.	Language.
<i>Udiapura</i>			Romaic	Ouranos	Ge
<i>Benares</i>			11. GERMANIC, 360	Himina, Himins	Airtha
<i>Munipura</i>			Alemannish, 720	Himil	Erdu
Goandee			<i>Classical German</i>	Himmel	Erde
Orissa			<i>Transylvanian</i>	Hemmel	Jerde
Telug			<i>German</i>		
Telinga			<i>Jewish Germa</i>	Himal	Hardi
Carnatic			Low Saxon	Himmel, Hemel	Eere, Erde
<i>Marwa</i>			Frieslandish	Hiemmel	Jerde, Yrtrik
Tamul			North Friesland	Hemmel	Eerde, Wroll
			Dutch	Hemel	Aerde, Eertryke, 1270
Maleiam			Danish	Himmel	Jord
Malabar			Norwegian	Himmel	Jord, Jera
Kanara			<i>Orkney</i>	Chimrie	Yurn
Decan			Icelandic	Himne	Jord
			Swedish	Himil, Himirik	Jord, Jordriki
Kunkuna			<i>Dalecarlian</i>	Himblum	Jord
Mahratta			<i>Gothlandish</i>	Ilymblum	Tord
			Danish Saxon, 880	Heofen	Eortha
Guzurat			English, 1160	Heaven	Eorht, Yearth
Beloshee			12. CELTIC		
(Afghan)			Irish	Neamh, Nau	Italamh, Thallamh, Talu
<i>Bikanira</i>			<i>Gaelic</i>	Neamh	Talamh, Dtalmbuin
Sindh			<i>Manks</i>	Niau	Tallu
Multan			<i>Walden</i>	Neamhbh	Talmbin
Gipsey			Cimbric		
Wuch			<i>Welsh</i>	Nefoedd, Nef	Ddaenr
Sikh			<i>Cornish</i>	Neau, Nev	Nore
Cashmir			<i>Brittannish</i>	Eon, Euff	Duar, Dovar
Kuch			13. ETRUSCAN	(<i>Bread, Puni, Urtu</i>)	
			14. LATIN	Colum	Terra, Tellus
Maldivian			Italian	Cielo	Terra
Cingalese			<i>Piedmontese</i>	Siel	Terra
Malayan			<i>Waldensic P.</i>	Cel	Terra
Sumatran			<i>Genoese</i>	Ze	Terra
<i>Batta</i>			<i>Onsernone</i>	Ciel	Terra
<i>Rejang</i>			<i>Venetian</i>	Zielo	Terra
<i>Lampuhn</i>			<i>Friulian</i>	Cil, Ciil	Tiarra
<i>Achim</i>			<i>Valais</i>	Cel	Terraz
<i>Néas</i>			<i>Bolognese</i>	Cil	Terra
<i>Poggy</i>			<i>Sicilian</i>	Celu	Terra
Javanese			<i>Sardinian</i>	Cel, Chelo, Quelu	Terra
Borneo			Spanish		
Andaman			<i>Castilian</i>	Cielo	Tierra
6. MEDIAN			<i>Galician</i>	Cel	Terra
Zendish			<i>Galic</i>	Ceo	Terra
			<i>Portuguese</i>	Cel	Terra
Pehlvis			<i>Romanic</i>	Ciel, Tshiel	Terra
Persian			<i>Provença</i>	Cel	Terra
(<i>Bucharian</i>)			<i>French</i>	Ciel	Terre
Kurdish			<i>Bearnish</i>	Cèou	Terro
			<i>Rovergne</i>	Cel	Terro
Afghan			<i>Flanders</i>	Ciel	Terro
7. ARABIAN			<i>Walloon</i>	Cir	Ter
Syriac			Wallachian		
<i>Assyrian</i>			<i>Dacian</i>	Tsheri, Czelurg	Pämentiv
Phenician			<i>Cutzo-Wallachian</i>	Cherio	Pimchita
<i>Punic</i>			15. CANTABRIAN	Sseru	Lurre
Hebrew			16. SLAVIC		
Chaldee			Sclavonian		
Samaritan			<i>Russian Church</i>	Nebes	Semli
Arabic			<i>Common Russian</i>	Nebo	Semla
<i>Modern Arabic</i>			<i>Malo-Russian</i>	Nebo	Semla
<i>Maroccan</i>			<i>Susdalian</i>	Nebo	Semla
Ethiopic			<i>Servian</i>		
Geez			<i>Uskok</i>	Nebesse	Semli
<i>Tigri</i>			<i>Ragusian</i>	Nebbu	Semgli
<i>Amharic</i>			<i>Transylvanian</i>		
<i>Hauasa</i>			<i>Scl.</i>	Nibe (<i>Bread, Linb</i>)	Semli
Maltese			<i>Croatian</i>	Nebi, Nebiesi	Semli, Kral
8. LYCIAN			<i>South Wendish</i>	Nebi	Semi
			<i>Hungaro-Wendish</i>	Nebi	Siemie
9. PHRYGIAN			<i>Polish</i>	Nieble	Ziemie
			<i>Kashubish</i>	Nebo	Semi
10. GREEK			<i>Bohemian</i>	Nebi, Wnebi	Semi
			<i>Servian, Upper</i>	Niebiu	Semi
			<i>Lusatia</i>		
			<i>Servian, Lower</i>	Nebu	Semi
			<i>Lusatia</i>		
			<i>Polabish, 1691</i>	Nibis, Nebui	Semi

Language.	Heaven, Sky.	Earth.	Heaven, Sky.	Earth.	Language.
(Greenland and Eschimaux)					
41. KAMTSCHATKAN <i>Tigilio K.</i> <i>Srednish</i> <i>Jozhnyshic</i>	Kochan, Hai Keis Kochal, Kollaa Kogal	Nuna Simmt, Nutä Semtüşhimta Sümmit	Darmitchequa Tacazze MAKOOA, Salt MONJOU, Salt	Goza, <i>Sky</i> (☉, Woka ;), Beja) Quegah, <i>Sky</i> (☉, Wah ;), Terah) (☉, K-zoo-ah ;), Mare) (☉, D''yoova ;), Mooze Mooeize) "a catch or click] (1, Chemo-je ; 3, Ma-da-too) (☉, Chur-rah ;), Tai-ya ; 1, K'ow ; 3, Sud-de) Semme (☉, Eer ;), Werke, 1, Ahad) Ivaq (☉, Adda ;), Dje-ä, Ba-te. S.) (☉, Airo ;), Al-sa) Am-too re, <i>Sky</i> Szemma (☉, Ayero ; , Al-sa, Berra)	Ennihah Hugga E-la-poo Mooze Di-che Laf-fa, S. Ba-ro A: de-Barroo Arikha Tsedy Berr Suru, Szura Mider Midre Ziv-va Negumani ; Song, Mossagan) (King, Negus ; Song, Mazenä) (King, Negus ; Song, Aedje) (☉, Kuara ; Song, Baze) (1, Deja ; 3, Oku) (1, Kidde ; 3, Metta) Lchidy Lisedi Souffe Doonit, Akai Ataman (King, Monsey) (1, Trono ; 3, Agurs- so) (☉, Atfuet) (☉, Itfuet) Berr Lanceh Banko, Binku Margetangala (1, Kidding) Bandee (1, Külle) (1, Enory ; 3, Sisa- jee) 1, Pin ; 3, Pisaas) Foy (1, Bul, Nimbul ; 3, Rah, Ninraa, Wint.) Bohhe Arädde Assasse Sipong Tshläh ; Head, II) (1, De ; 3, Otton) Jiwel (1, Depu) (1, De ; 3, Ezong)
(5.) INSULAR ORDER.					
42. CURILEE 43. EASTERN ISLANDS 44. JAPANESE	Niss Inkak Ten	Kotan Tshekak Tsatsmo, Cino, Ci, Tji, Dsi Zudshi Nay, Nai	SOWAULI, Salt SOMAULI, Salt HURRUR, Salt GALLA		
45. LEU CHEU 46. FORMOSAN 47. PHILIPPINE	Diänni Vullum, Tounnoun	Buchit, Dunga Lopa Lupa, Tana Yuta	ADAIEL, Salt DANAKIL, Salt DUNGOLISH		
Moluccan Magindanao Tagalish Bissayish <i>Sulu</i> Bugis	Languin, Surga Langit Langit Langit	Tana Bütta	BORNOU, Burckhardt BORGO, Burckhardt DARFUR		
<i>Mungharar</i>	(Day, Aso ; Sun, Mataso) (Day, Alo ; Sun, Matalo)		(AMHARIC) Salt		
Pelew	Yängley (Day, Ko- kuhk ; Bad, Mogull)	Tano Tuguta Kille Vorai. Rai Labuad Taar. Behoul Nabagr ? Dana Bami Poapoa, Popo	(TIGRE) Salt AGOW, Salt Tsheraz A. Damot A. Gafat Falasha		
Mariana Friendly Islands Coco Islands Savu Pampang New Guinea New Britain Bima <i>Sumbawa</i>	Languit Elandshi (Food, Maa) (Food, Maa) Liruh Bar (Sun, Mataliro) (Sun, Matahari)		SOUDAN BEGIRMA FULAH PHELLATA YALOFS BERBER		
48. NEW HOLLAND F. 49. VAN DIEMEN'S LAND	Kere (Father, Bina)		Canary Tibbo		
50. NEW CALEDONIAN 51. NEW ZEALAND	Ndaoö (Bread, Eei ; Bad, Kino)	Guihse. Do Uenua	Shillah Sivah SERERES SERRAWALLIS MANDINGO YALLONKA		
Otaheite	Erai (Food, Maa ; Bad, Ino)	Hwennua	SOKKO FELUPS		
Marquesas Sandwich Islands	Tahua, Hani Harani (Bad, Ino)	Hwenua Motu	TIMMANEY, Winterb. BULLAM		
52. EASTER ISLANDS	(Father, Mama)	Soupe, Henua	SUSU Fetu KANGA MANGHEE GIEN QUOJA FANTE AKRIPON AMINA Akkim Akra TAMBI WHYDAH Papua Watje		
IV. AFRICAN CLASS.					
EGYPTIAN <i>Coptic, Memphitic</i> <i>Sahidic, Thebaic</i> <i>Bashmuric</i> <i>Oastitic</i>	Phe Pé Pé	Kahi Kahe, Kah Kähi			
BARABRISH KENSY, Burckhardt	Szemma Semeyg (Day, Ou- gresk)	Iskitta Aryd			
NOUBA, B. BISHAREEN, B. <i>Adareb</i> , Salt ARGUBBA	Sema (Day, Aly) Otryk (Day, Toy) (Day, Ombe) (Father, Anathien ; Head, Dimmaha) (2, Killot ; 3, Szälis)	Gourka Tobüt			
MASSOWAH AKKEEKO, Salt	Astur (<i>Sky</i>) (Day, Ummet) (2, Kille ; 3, Selass)	Midur			
STAKIN SHIRO, Salt TAKUE, Salt	Tebre Aroan (Man, Grua ; Water, Ane)	Wuhash Baru			
BAREA, Salt	(Man, Ookooi ; Wa- ter, Umba)				
MUTSHUANA, Salt	(☉, Iet chachi ;), Wirri). See <i>Beet- juana</i>	Lchachi			
BRIQUA, Salt SHANGALLA, Salt	(1, Onochela, 3, Taroo, Miraroo)				















Language.	Heaven, Sky.	Earth.	Heaven, Sky.	Earth.	Language.
CALBRA Camacons C. Lobo Gonsalvas	(1, Barre; 3, Terre) (1, Mo; 3, Melella) (King, Sauepongo; Bad, Mondello)		North. Tupi, Bra- zil	Ibaca	
LOANGO	Iru (1, Boosse; 3, Tattu)		C. East of Paraguay 11. Brazilian dia- lects		
CONGO	Sullo	Toto	Common	(O, Arassu; 1, Gipi; 3, Busapu; 4, Bu- sapu munan gipi; 6, Busapu sapu Arndt)	
Ang-la	Maulu, Beulu	Boxi, Toto?			
MANDONGO	Sambiampungo (1, Omma; 3, Metatu)		Kiriri	Arakie	Bu
CAMBA	Julo (1, Moski)	Aamano	Curumare	(God, Aunim)	Rada
ANGOLA, Hervas	Monte		Forty-nine others unknown.		
KARABARI	Elukwee (1, Otuh)		D. West of Paraguay		
Ibo	Tshukko, Ellu (1, Otuh)		12. Aquiteguedi- chaga		
MOKKO	Ibanju (1, Kia)		13. Guato		
WAVU	Barriudad (1, Baba)		14. Ninaquigulla		
TEMBU	So (1, Kuddum)		15. Guana		
KREPEER	(Bread, Apohae; Head, Ota)		16. Mbaya, Guaikur	Titipi guime	
ASSIANTHES	(Bread, Abodo; Head, Otri)		17. Payagua		Jego
KASSENTI (BORNU)?	Ktak (1, Obaa)		18. Lenguas		
AFFADEH	Dilko	Ftūng	19. Enimaga		
MOBBA	Szemma	Barr	20. Gulentuse		
SHILLUH	(1, Warre; 3, Kod- dus)		21. Yacurure		
(DARFUR)			22. Machikuy		
DARRUNGA	(1, Kadenda; 3, Attih)		23. Mataguaya		
(GALLAS)			24. Malhalae		
SHAGGAI	(Soldier, Gonso)		25. Pitilaga		
MADAGASCAR	Danghitsi, Langhitsi, Lainch, Atemco	Tane, Tanne, Zanne	26. Toba	Piguem	Alua
LAGOA BAY	(1, Chingea; 3, Tri- rarou)		27. Abipon	Ipigem	Asloa, Aaloba
KOOSSA	Ishlu	Umtillaha	28. Mocoby	Ipiguem	Aloba
BEETJUANAS	Maaro	Lehaatsi	29. Agullot		
Mutshuana	(1, Oonchela; 3, Ta- roo, Miraroo)	Lebochi	30. Chumipy		
SOUTH	(1, Enje; 3, Atatu, Zintate)		31. Vilela	Laue	Basle
CAFFRES			32. Lule	Zo (God, Ano)	Ama, A.
HOTTENTOTS	Inga?	Ki, Kōo, Qu'au Gam- kamma	E. Coast of Peru		
Coranas	(1, T''kōey)	T''kehaub	33. Quichua	Hanacpacha; Hanac? (O, inti)	Caypacha, Cay? All- pa
Saldanha	Homma	Hu	34. Aymara	Alapacha, Alai	Acaphan, Aca? Urakke
Bosjemans	T''gachuch	T''kanguh	35. Puquina	Hanigo	Cohua
The Hottentots have three particular clicking sounds, made by withdrawing the tongue from the teeth, the fore part, and the back part of the palate: they are respectively denoted by T', T'', and T'''. The first two appear to resemble the sounds sometimes used to express a trifling vexation, and to make a horse go on, or to call to poultry.			36. Yunka Mochika	Anguic	Capuc
			F. East of Peru		
			37. Samuca	Guiate	Numitie, Nup
			38. Chiquitos	Ape	Aaqui, Quits
			39. Moxos	Anamocu	Kiere, Motehi
			40. Mobimi	Benrra	Yanlo, Llacamba
			41. Cayubabi	Idah	Idatu
			42. Itonami	Numane?	Nicosnone
			43. Sapiboconi	Euocuepana	Mechi
			44. Heresibocana		
			45. Canesiana		
			46. Pana		
			47. Rema		
			48. Pira		
			G. East of Quito, on the Marañon		
			49. Aquanos, Xe- beros	Inapa	Isse
			50. Mainas	Arresiuma	Popo
			51. Yameos	Ehuatamai	Tuyuca
			52. Omagua, Yuru- magua		
			53. Yahua; 100 more		
			H. From R. Negro to Oronoco		
			54. Maipuri	Eno	Peni
			55. Salivi	Mume	Ada? Seke?
			56. Guaivi, Ciricoa		
			57. Achagua		
			I. About Casanare		
			58. Yarura	Ande	Dabu
			59. Betoi	Ubu, Tentucu	Umena? Ajao? Dn
			60. Situfa, Girari		fibu
			61. Ottomak	Caga	Poga
			62. Guama, Guaneri		
			K. North Coast	Cap	
			63. Tamanac		Nono
			64. Arawac	Aijumun, Kassakku	Wunabu

V. AMERICAN CLASS.

(1.) SOUTH AMERICAN.




A. Southern Extre- mity	Heaven, Sky.	Earth.
1. Terra del Fuego	(A. Penguin, Com- poggre)	
2. Patagonia, Chili		
Moluchan. Arau- kan	Huenu (O, Antu; Tue mapu Hill, Calul)	
Tehuelhet	(Hill, Calille)	
Puelche	(Hill, Casu)	
B. East from R. Plata to Marañon		
3. Charrua		
4. Yaro		
5. Bohane		
6. Chana		
7. Minuane		
8. Guenoa		
9. Karigua		
10. Guarany South West	Ibag, (O, Cuarazi)	Ibi






Language.	Heaven, Sky.	Earth.	Heaven, Sky.	Earth.	Language.
65. Carib Yaoi Islands L. Mountains in the N.W. 66. Muysca 67. Kiminza 68. Popaya 69. Darien	Oubaeou Capou Men Women (☉ Sua; Man, Muysca)	Monha Soye Nonum Monha	10. Ecclemach D. About Nootka 11. Nootka Sound 12. Atnah 13. Friendly Village 14. Queen Char- lotte's Island 15. Colushan	(1, Pak; 3, Ullef) Nas, Inaihl nas (☉, Opulsthl; 1, Tsa- wak; 3, Catsa) (Water, Shaweliqoih; Head, Scapacay) (Water, Ulkan; Fire, Neach) (Fire, Tesh; 1, Soun- chou; 3, Slōōnis) Ki, Keu, Kiiwa, Ki- tani, Kügon, Chaaaz	Tljaknak, Tlatka, Tlekwa, Tka, Shu, Tlinkitaannü
(2.) MIDDLE AMERICAN.					
A. Islands 1. St Domingo	(Field, Conuco; Meadow, Savana; House, Boa; Bread, Casabi)		16. Ugaljachmuzi 17. Tshinkitany 18. Kinaizi	(Stone, Te; Mex. Tetl) Koas (Throat, Kat- katl; Mex. Cocotl. "Boil, Coatk; Mex. Coxitia") (☉, Kranc; 1, Clerg, Kaika; 3, Notshk, Netx) Jujan, Juon, Jugan Altnen, Alalen An	
B. Darien to Guate- mala 2. Kiche, Utlateca 3. Poconchie	Taxah (☉, Quih; Acal, Vleu Head, Na; Hand, Cam; Bad, Tséri)		E. West of Missis- sippi 19. Blackfooted In- dian Blood Indian, Pe- gan 20. Tall Indian 21. Sussee 22. Snake Indian 23. Nadowessian	(1, Tokes-cum; 3, Nohokescum) (1, Karci; 3, Narce; 4, Nean) (1, Ut-te-gar; 3, Tau- key; 4, Tobo) Uohta tibi (☉, Paetâ;), Oweeh) (Dog, Shong; 4, Tope)	
4. Yucatan, Maya, Caanné C. Table - Land of Mexico 5. Mixtecan 6. Totonacan	(☉, Kin; Hand, Cab) Luam Andihui, Andi Tiayan, Acapon, Aca- paian (1, Tom; 3, Toto)	Nunñahui, Nunal Nitiet?	Assinopoetus Sioux 24. Saki, Ottogami Menomene 25. Osage	(Wind, Tattasuggy; [Brothers, Tinai- tauna ?])	
7. Mexican, Azte- kan 8. Huastecan 9. Othomi 10. Mechoacan 11. Pirindan 12. Tarascan	Ilhuicatl (☉, Tona- tiuh; 1, Ce; 3, Yei) Tiaeb (☉, Aquicha; Head, Nâ) Mahêtzî Pininte Avandaro (1, Ma; 3, Tanimó)	Tlalli Tzabal Chimohôî, Hoy	Winnibeg, Maha Missouri, Oto Arkansa, Kanze 26. Pani 27. Caddo, Natshi- totshe 28. Adaize, Atta- hapa F. West of Missis- sippi, to Ohio 29. Floridan, Apa- lache 30. Timuacan	(Agreeable, Hitanachi; Priests, Jaoia) (My, Na; Elder Bro- ther, Niha; 1, Mi- necotamano; 3, Nahapumima) (☉, Ona, chill) (☉, Hashseh, Husâ; 1, Hommai, 3, Toot- shêna) (☉, Hashe, Hasce; 1, Chephpha; 3, Tootshêna) (☉, Busse, Anantoge calesta; Fire, Choela; 1, Soquo) (☉,), Witapare; Water, Eau; 1, Tonne; 3, Nam- mee) (☉,), Nooteh; Wa- rer, Bjan) Karongiage, Cauroun- kyawga, Kaaron- hiate, Toendi	
D. California to Ri- del Norte 13. Coran 14. Tepehuana, To- pia 15. Tubar 16. Tarahumaran 17. Zuaquan, Yaqui 18. Pima 19. Eudeve 20. Opata	Tahapoa Tegmecarichui Guami? Bad, Tseti; Dog, Cocotshi) Tevecapo Titaquacatum? (I, Ani; 1, Mato; 3, Waik) Tevictze? Tequiaca?	Chuêhtl Nuniguatae Guê Buyapo Inatuburch? Yuhtepatz; Terepa?	31. Natshes 32. Muskohge, Creek 33. Chikkasaw Choktaw 34. Cherokee 35. Woccon 36. Katahba 37. Six Nations	(Fire, Ocheseleh)	Oo-hon-cha, Owheh- cheat, Ahunga, O- hunjea, Uchiwun- kia, Ondeehra
(3.) NORTH AMERICAN.					
A. N.W. of New Mexico 1. Jetan, Apache 2. Keres, Moqui B. About California 3. Pericu 4. Waicuric	Tekerricadatemba (☉, Datemba Ibo, Ibunga;), Gomma, Ganehma)		Mohawk Seneca		
5. Cochimi, Lay- mon C. N. of California 6. St Barbara 7. Eslene 8. Runsién 9. Achastilien	Ambayujui, Ambeing Keammetê, Amet, Ametetenang (Head, Necchû; 1, Pacâ; 3, Mapja) Imita (☉, Tomanis ashi; 1, Pek; 3, Julep) Terray (☉, Orpetuel istmen; 1, Enjala; 3, Kappes) (1, Moukola; 3, Capes)				








Language.	Heaven, Sky.	Earth.
<i>Onondago</i>	(Dog, Chierha)	
<i>Oneida</i>		
<i>Cayuga</i>		
<i>Tuscarora</i>	( , Hatshe-nyahah Water, Auweau Dog, Cheeth)	
G. West of Hudson's Bay, and S.W.		
38. Chippeway of Del.	(Tooth, Tibbit, W-bit; 3, Taghee; 4, Neon, Nea)	
39. Delaware	(Tooth, Weepeat)	
40. Algonkin Mohegan	(Tooth, Tibit; 4, Neou)	
41. Shawanno	Spimiki (Tooth, Ne-pittalleh)	Assiskia
<i>Pampticough</i>		
42. Miami, Illinois	Kechekoué ( ,  , Akihekoué Kilswoa; Tooth, Neepeetah)	
43. Kikapoo	( ,  , Kishessu)	
44. Piankashaw		
45. Pottawatameh	(Tooth, Webit)	
46. Delaware	Acoossagame (Tooth, Weepeat)	Achquidhackamicke, Agt, Hogkey
47. Minsi	(Tooth, Wichpit)	
48. Sankikani	(Tooth, Wypyt)	
49. New Sweden	"Hocque" (Hocque, Jos)	
50. Narraganset	Keesuck (3, Nish)	Aucke Hocque
<i>Natik</i>	Kesuk (3, Nishnoh)	Ohke
51. New England	(Tooth, Mepeteis; 3, Nis)	
52. Abenagui		
53. Mohegan	Spummuck (Tooth, Weepeatan)	Hacki, Nohnkey
54. Penobscot	(Tooth, Weepeatah)	
55. Souriquois	Ouajek ( , Kissis; Tooth, Nebidie)	Megamingo
56. Micmic	Oaiok	
57. E. Chippeway	Speminkakuin	Aukuin
58. Messisauget	( , Keeshoo)	Nindohockee
59. N. Algonkin	Spiminkakuin	Ackouin, Acke
60. Knistenaux	( , Pisim; Head, Us-ti-quoine; 4, Neway)	Messee asky
61. Nebetawa	(4, Naou)	
62. Skoffie	(Head, Mestichee)	
63. Mountanee	(Head, Teekechee)	
64. W. Chepewyan Mack.	( ,  , Sah; Head, Ed-thie)	
65. Nagail	(Head, Thie)	
66. Hudson's Bay Islands	(Head, Tenet thie)	
H. North Coasts		
67. Greenland	Killang, Killak ( , Ajut, Seekanach;  , Anningat; 1, Attausek; 3, Pingasut)	Nuna
68. Eskimaux	Taktuck, Nabugakshe ( , Sukkinuch;  , Tatcock)	
69. Tshugassic	Koilak	Nuna
70. Norton Sound	(Hand, Aishet; 1, Adowjack; 3, Pingashook)	
(71.) Tshuktshe	Keilak	Nuna
71. Jakutat	Kilag	Nuna
72. Konage, Kadjak I., or Kikhtak	Killach (Hand, Aiget; 1, Alchallack; 3, Pingaic)	Nuna

The tables will at least serve, notwithstanding some imperfections and uncertainties, as a convenient synopsis for facilitating the reference to a brief sketch of the history of the different families of languages.

1. The strongest proof of the great antiquity of the CHINESE language appears to be the extreme simplicity of its structure, and the want of those abbreviations and conventional implications which have been sometimes called the wings of languages. It is natural that, in attempting to express ideas at once by characters, the rude pictures of material objects should first

have been principally, if not exclusively traced; thus the Egyptians had ,  for the sun and moon, and  for a country

or field, and the Chinese have still , ,  for these objects respectively, the characters having been made square instead of round, which some of them were in their more ancient forms. The Egyptians represented a man by a figure kneeling, and stretching out his hand, or, in the enchorial character, thus . The Chinese figure may originally have been of the same form; but at present is more like a pair of legs only, , whilst a dog seems to have three or four legs,

 or . A thousand, according to Mr Jomard's ingenious conjecture, was copied from the lotus, with its seed vessel, having a great multitude of seeds, and the Chinese  is certainly not altogether unlike the Egyptian ; nor is the character for light , which seems intended to represent a radiant body, altogether different from the  or  so often

found among the hieroglyphics of Egypt, although it is not easy to believe, with Mr Palin, that the manuscripts found with the mummies agree precisely with a Chinese version of the Psalms of David, character for character. The successive introduction of figurative expressions and characters may easily be imagined; but it would be useless to enter at present into further details of this kind, on grounds almost entirely speculative. The Chinese are said to have been, in the ninth century, a race of people resembling the Arabs; their physiognomy was contaminated in the thirteenth and fourteenth by a mixture with their conquerors, the Mongols; but their language remained unaltered. The dialect of Tonkin is sometimes called the language of Anam, and the Guan: on occasions of state they use the Chinese character, but more commonly a character of their own, probably resembling that of the Siamese. Dr Leyden observes, that at least twenty different nations employ the Chinese characters, though they read them quite differently; and he considers the Cochinchinese, the Cantonese, and the Japanese, as all essentially different from the Mandarin Chinese, though they have all some words in common. He gives us as the names of the dialects of Chinese, constituting almost as many separate languages,—1, Kong, spoken at Canton; 2, Way; 3, Nam; 4, Chéu; 5, Séu; 6, Lúi; 7, Limm; 8, Khum, or Mandarin; 9, Siu; 10, Kunng; 11, Hyong san, spoken at Macao; 12, San tahk; 13, Nam kéi; 14, Pán ngi; 15, Tòng khún; 16, Fo khun, or Chín-chow. There is also a language spoken by the Quan tó, between Tonkin and China, a people who consider themselves as more ancient than their neighbours. Notwithstanding, however, all this supposed diversity, we may trace a considerable resemblance in the spoken language, even as far as Corea. In all these dialects, the conversation is a sort of recitative, and the different notes give distinct meanings to the words; as, in fact, we distinguish in English the sense of M? from M! or simply M.; tones perfectly understood, though never written. The Chinese are without the sound of the letter r, and several other sounds common in Europe; the only way in which they express foreign words is by putting together the characters of the nearest import, with a symbol of pronunciation annexed to them; thus, for *Christus* and *Cardinalis*, they are obliged to write *Ki lu su tu su*, and *Kia ul ji na li su*, with a mouth annexed to them. The names of places are generally distinguished by a square inclosing the characters which express them; and the names of men, in some books, by a line drawn on one side of the characters only. In this there seems to be a distant analogy to the ring which incloses proper names in the Egyptian inscriptions, but the names of places were not distinguished in this manner by the Egyptians. The dialects of Cambodia and Laos have received some mixture of Malayan from their neighbours; in writing the former of these, sometimes called *K'hómén*, according to Dr Leyden, the Bali, or old Sanscrit character, is employed; and the latter has some analogy with the Siamese; indeed, both the Siamese and the

Language. AVANESE are disposed to derive themselves from Laos. It may be seen, from the specimens exhibited in the article *PHILOLOGY*, that at least some of the Chinese dialects have sounds agreeing in several instances with European words of the same import; but the agreement is scarcely precise enough to justify our inferring from it an original connection between the languages.

2. The language of SIAM resembles the Chinese in its simplicity and metaphorical structure, though not so decidedly monosyllabic. It is obvious, however, that the distinction of monosyllabic and polysyllabic could not, in very ancient times, have been so positively laid down as at present, since it was usual, in almost all countries, to write the words contiguous to each other in a continued series, without any divisions between them; and, even in modern printing, there is a happy invention, which often restores this agreeable obscurity, under the name of a hyphen, by the use of which we avoid the difficulty of determining whether we wish to employ one word or several. The Siamese call themselves *T'hay*; and a part of their country is distinguished by the appellation *Tai hai*, or Great T'hay. The numerals resemble the Mandarin Chinese; several words of the language are borrowed from the Bali; it is written in an alphabetical character, which is said to be complicated and refined.

3. The AVANESE, or *Burmanish*, has also borrowed some polysyllabic words from the Bali, and is written in a peculiar alphabetical character. It must be considered as an era in the history of this country, that its emperor has employed Mr Felix Carey, at his own expense, to establish a printing press at Ava, his metropolis, for printing a translation of the Scriptures in Burmanish. A dialect, spoken in the district called Tanengrari, is said to be of greater antiquity. The *Môn* or *Peguan* is called by Dr Leyden a distinct original language; but it is written in the Avaneese character; and Adelung's specimen scarcely differs at all from the Burmanish. The language of Arakan and Rashaan is called *Rukheng*; it contains a number of words from the Bali, many of them converted into monosyllables by an imperfect pronunciation. Dr Leyden considers it as the connecting link between the monosyllabic and the polysyllabic languages; and he calls it an original language, notwithstanding its acknowledged derivation from its neighbours. It employs the Devanagiri alphabet, including the letter *z*. Out of fifty words of Rukheng, quoted by Buchanan, the seven which are not Burman are only varieties of pronunciation. The *Kiayn* or *Kolún*, and the *Kukis*, N.E. of Chittagong, are mentioned as neighbouring tribes, speaking languages almost entirely different from the Rukheng. We find, in Mr Buchanan's paper, some specimens of the languages of the Burma empire, which it is difficult to distribute methodically without a further knowledge of their peculiar characters, but some of which may, without impropriety, be introduced here.

	Earth.
Myamtau, in Burma	(Head, Kaung; Wind, Mysagee Lae)
Yakain, in Arakan	(Wind, Lee)
Tanaynthoree	
Yo	(Stone, Kionkag)
Moitag, near Assam	(Head, Kop, Kok; Leipauk O, Noomeet)
Koloun, or Kiayn	(Head, Multoo; O, Dag Konee)
Kurayn or Kaloon	
Passoko	(Head, Kozohui; O, Katchaykoo Moomag)
Maploo	(Head, Kohuin; O, Kolanghoo Moo)
Play	(Head, Kohui, Poko-chui; O, Mooi, Moomag)
Hindu of Burma	
Rooinga	(Head, Mata; O, Bel)
Rossawn, Arakan	(Head, Mustok; O, Murtiha Sooja)
Banga, or Ayhoba	(Head, Teekgo; O, Matee Baylee)

4. The language of TANGUT, or the Tangutish, has some words in common with the Chinese, but is less simple in its structure. It is at least as ancient as the religion of the country, which is nearly coeval with Christianity. Its character is

well known to be alphabetical, from the title of the learned *Language* work of *Father Georgi* on the subject.

[The Anamitic of Tonquin and Cochinchina is a separate language, with Chinese affinities.]

The Môn of Pegu is (what Dr Leyden makes it) a separate language from the Burmese.

The Rukheng is Burmese.

Nothing has to be subtracted from this class. The additions, however, are numerous.

1. Numerous forms of the speech of the ruder branches of the Burmese—viz., Kariens, tribes of the Yuma Mountains, tribes of the interior of Aracan.
2. The same in respect to the Siamese—Khamti, Laos, &c.
3. Forms of speech, with Burmese affinities—more or less close—from Sylhet, Tippera, Chittagong, Manipur, and the southern frontier of Assam—Naga, and other dialects.
4. Forms of speech from the northern and eastern frontiers of Assam—more or less Burmese, Siamese, and Tibetan—Jili, Singpho, Mishimi, Abor, Aka, Dofla, &c.
5. Sub-Himalayan forms of speech—Garó, Kooch, Bodo, Dhimal, &c.
6. Sikkim and Nepal forms of speech—Lepcha, Limbu, Murmi, Newar, &c.
7. The Chepang of Kumaon.
8. The Andaman.
9. The language of the Nicobar Islands.

10. The languages (Sifan) of the ruder parts of China.—R. G. L.]

5. The *Indo-European* languages have been referred to a single class, because every one of them has too great a number of coincidences with some of the others to be considered as merely accidental, and many of them in terms relating to objects of such a nature that they must necessarily have been, in both of the languages compared, rather original than adoptive. The *SANSKRIT*, which is confessedly the parent language of India, may easily be shown to be intimately connected with the Greek, the Latin, and the German, although it is a great exaggeration to assert anything like its complete identity with either of these languages. Thus, we find, within the compass of the Lord's Prayer only, *Pida*, *Pitir*, among the Sanscrit terms for Father; Gr. *Pater*. *Nama*, or *Namadhya*, for Name; Gr. *Onoma*, *Onomati*. *Radshiam*, Kingdom; Lat. *Regnum* from *Rego*. *Manasam*, Will, like the Gr. *Menio*, and the Latin *Mens*. *Sitra*, Earth; Gr. *Era*, whence perhaps the Latin *Terra*: and *Danim*, or Devanagiri *Dia*, Day; Lat. *Dies*. There are also some singular resemblances of declension and conjugation between the Sanscrit and the Greek, *Dodami*, *Dodasti*, *Dodati*; in old Greek, *Didomi*, *Didoti*, *Didoti*. In a tablet of the date 23 B.C. we find *Kritiko* for a Judge, Gr. *Crites*, *Criticos*. In Mr Townsend's work we also find some well-selected instances of resemblance between the Sanscrit and other languages: thus, *Bhru*, is Brow; *Pota*, a Boat; *Bad*, a Bath, Germ. *Bad*; *Dhara*, *Terra*; *Nava*, *Novus*; *Nakta*, *Nocte*, Night; *Pad*, Foot, *Patte*; *Pruthama* or *Protoma*, First, whence we deduce both the Greek *protos* and the Latin *primus*; and *Upadesaca*, *Didasco*, *Doceo*, and *Disco*. We have also *Vayajan*, Wind; in Russian, *Vieyante*: and *Vilhuva*, Widow; Latin, *Vidua*; German, *Wittwe*; Russian, *Vidova*. The *NT* of the plural verb is found in the Sanscrit *Bhuvanti*, They are; *Dadanti*, They give. Sir William Jones and many others have attributed to some of the works which are still extant in Sanscrit an antiquity of 4000 or 5000 years; but Professor Adelung denies the validity of any of the arguments which have been adduced in favour of a date at all approaching to this.

The Sanscrit, even in its earliest state, can scarcely have been altogether uniform throughout all the countries in which it was spoken, and it has degenerated by degrees into a great diversity of modern dialects: the term signifies learned or polished. Beyond the Ganges, it is called *Bali* or *Magudha*, which, the missionaries say, "scarcely" differs from Sanscrit; the term *Magudha* is said to mean mixed or irregular. In Siam the Sanscrit is still the language of elegant literature; and it is often employed throughout India, with some little difference of construction, under the name of *Devanagari*, the divine language. The *Prakrit* is rather a vague term, meaning, according to Mr Colebrooke, common or vulgar; but it is also applied to the language of the sacred books of the "Jainas." We find in a little publication, entitled a *Brief View of the Baptist Missions*

Language. and Translations, some useful information respecting the Indian languages and dialects, into a great number of which these laborious and disinterested persons have made or procured translations of the whole of the Scriptures, which they have printed at Serampore, near Calcutta. The dialects which they enumerate are principally arranged in a geographical order; and, beginning with those which are spoken towards the middle of India, as the pure *Sanscrit* and its least modified dialects, we may place next to them the languages of the countries bordering on the monosyllabic nations, toward the N. and E. We have here the dialects of *Nepal*, *Assam* or *Uthumiya*, *Tipperah*, and *Kassai*, of which little more is known than that translations into the first two have been already executed. The *Bengalee* is spoken in and about Calcutta. The *Hindee* or *Hindwee* is spoken about Agra; it is printed in the Devanagri character, the font of which contains more than 800 varieties of letters and their combinations. The *Urdu* or *Oordoo* is a sub-dialect of the Hindee, as well as the *Brijbassa*, which is nearer to the Sanscrit than some other dialects. The *Jypura* is mentioned as another language belonging to the same neighbourhood. The *Hindustanee* is spoken in Hindustan Proper, or Lower Hindustan; the missionaries say it is "diagrametrically different" from the Hindee. The *Moors* or "Mongol Indostanish" seems to belong to this country, being mixed with a good deal of Persian and Arabic, unless it be rather referable to the Hindee. The dialects of *Udaipura*, *Benares*, and *Munipura*, are also called separate languages. The *Goandee* is spoken at Nagpore, in the Mahratta country. Further east is *Orissa* or *Uriya*, the language of which is printed in a character requiring 300 different types. The *Telug* or *Warug* is spoken about Cuddalore and Madras: the *Telinga* further west. The *Carnatic* has a peculiar language, besides the *Tamul*, which is spoken from Paleacate, near Madras, to Cape Comorin, and the *Marwa*, which appears to belong to a part of this country. About Cochin in Travancore we have the *Maleiam*: further north, the languages of *Malabar*, *Kanara*, and of the *Deccan*. The dialect of Malabar is of considerable antiquity, being found in two copper tablets as old as the eighth or ninth century. Then comes the *Kunkuna*, about Bombay. The *Mahratta* is further inland; the *Guzerat* on the coast; and, beyond the Indus, the *Beloshee* in Belochistan. North of this we find the *Afghan* or *Pushtu* language, which contains more Hebrew words than any of its neighbours; the people are said to have come from the N. about 2000 years ago, and, according to a Persian tradition, to be descended from King Saul; indeed, the language stands somewhat more correctly under the Median family in the *Mithridates*, but since it forms the connecting link between the two families, it might perhaps be as conveniently arranged among the more numerous species of the Sanscrit; it is written in the Arabic character, with some additional letters for expressing the Sanscrit sounds. The language of *Multan*, N. of Sindh, has about one-tenth of Persian mixed with it. The *Gipsies* were certainly expelled from some part of India by the cruelties of Timur Leng, about the year 1400; and there were probably some of the *Zingans* in the neighbourhood of Multan, their language having a great number of coincidences with that of Multan, and being still more manifestly a dialect of the Sanscrit, although they have adopted many European, and especially Slavonian words. When they first appeared in Europe, they were supposed to amount to about half a million; at present they are less numerous.

The *Maldivian* is peculiar to the group of small islands from which it is named; the Baptists have already printed some books in it. The people are said greatly to resemble those of Ceylon. The *Cingalee*, which is spoken in great part of Ceylon, is a mixture of several of the continental dialects; and it has been observed, that the proper names in Ceylon mentioned by Ptolemy are of Sanscrit origin.

[The Sanscrit can scarcely be called "confessedly" the parent language of India. That the languages of the Dekhan are Sanscrit, only in the way that English is Latin (*i.e.*, in respect to some incorporated elements), is generally admitted. That the northern forms of speech are Sanscrit is beginning to be doubted. That their vocabulary is largely Sanscrit is certain. Not so, however, their grammar. The forms of speech that, at one and the same time, are most generally treated as separate languages, and, at the same time, most especially believed to be of Sanscrit origin, are—

1. The Hindui, *i.e.*, the Brijbasa of the text.
2. The Gujerathi of Gujerat.
3. The Udiya of Orissa.
4. The Bengali.
5. The Mahratta.

The Multan, Punjab, Scinde, Rajasthan, Cashmerian, and other less important forms of speech, belong to this division, and chiefly approach the Hindui section of it.

The Hindostani is a *Lingua-Franca*, rather than a true native form of speech.

On the other hand, the Teluga, Telingga, Canarese (or Carnatic), Malayalim, and Kunkuna (or *Kunkar*), are all *Tamul*; as are all the Todah, Glond, Khond, and Kol dialects; as well as that of the Rajmahali mountaineers, on the very verge of the Ganges, and within 100 miles of the southern boundary of the sub-Himalayan monosyllabic tongues.

The basis of the Maldivian and Cingalese is *Tamul*; the place of many of the Bhil dialects being, if not in the *Tamul* class, at least intermediate.

In Biluchistan the Biluch is not the only language. The Brahui of the mountains is spoken concurrently with it, and that is *Tamul*, or South Indian.

Of Nepal, Assam, Tipperah, and the Kasia country, the native dialects are all monosyllabic. It is only the intrusive forms of speech that are Indian.

The Afghan and Biluch are Persian, rather than either *Tamul* or Northern Indian.—R. G. L.]

Dr Leyden gives, as a proof of the antiquity of the *Malayan*, that the *Temala* of Ptolemy is derived from *Tema*, tin. The connection of this language with the Sanscrit has not been very universally admitted; and some of those who have studied it most are disposed to consider it as wholly original; but, in the purest part of the language, Dr Leyden confesses that there is a considerable resemblance to the Avanes and the Siamese; the words derived from the Sanscrit he considers as somewhat less numerous, amounting, however, to about 5000; they are generally less like the Bali than the Sanscrit, and a still smaller number are borrowed from the Arabic. The character of the monosyllabic languages is in some measure retained. Sir William Jones considered the *Malayan* as a derivative of the Sanscrit; Mr Marsden supposes it to have received its Sanscrit words through Gujerat; Dr Leyden rather from Kalinga or Telinga; and it exhibits some traces of the dialects of *Tamul* and *Maleiam*. Besides these various sources, it is said to have borrowed some of its simplest words from the Javanese and the Búgis; and it has become more nearly monosyllabic by dropping the first syllables of some of the words which it has adopted. The *Javanese* is said to be more ancient than the *Malayan*: the empire of Java was formerly powerful and flourishing: the ancient language was much like the Sanscrit, more so than the *Malayan*, but was written in a peculiar character. Dialects of this language are still spoken in Bali and in Madura. Leyden thinks the Malays were derived from Java; Marsden rather from Sumatra, though he allows that there are some reasons for conjecturing that an old Sanscrit colony may have settled many hundred years ago in Java, and mixed its language with a supposed mother tongue of that Asiatic race.

Of the *Sumatran* dialects, the principal, according to Dr Leyden, is the *Batta*, spoken by a people who occupy the centre of the island, and who still, like some other Indian nations, retain the custom of eating their old relations. The language seems to be partly original, and partly connected with the *Malayan*; and other dialects of the neighbouring islands. The *Rejang* is chiefly a mixture of *Batta* and *Malayan*; in the *Lampuhn* or *Lampung* there is also some Javanese. The *Achi* has admitted a still further influx of words belonging to all the Mussulman jargons of the neighbourhood, especially to that of the Mapulas of Malabar. There are other dialects of less note in Néas and the Pogygy Islands, most resembling the *Batta*. This language is provided with a peculiar alphabet, which is remarkable for being written from the bottom of the paper upwards, like the Mexican hieroglyphics; though the Battas, as well as the Chinese, sometimes hold their books so as to read horizontally. In Borneo there appear to be several dialects, or rather separate languages; two of them, according to Dr Leyden, are the *Biaju* and the *Tisun*.

[The Malay is nearest the southern members of the mono-

Language.

Language. syllabic stock. In Malacca and Sumatra it is spoken with little variation, with more in Borneo, more still in Java and Celebes, and the Philippines. It then passes through the intermediate forms of Lord North's Island, the Pelews, &c., into the Micronesia of the Carolines and Mariannes; thence on to the Polynesian of the Navigators' Isles and all the islands between New Zealand S. and the Sandwich Isles N.; the Fijis W., and Easter Island E. The islands between Java and Timor (the latter included) are Malay. So is, to a great extent, the language of Madagascar.

The numerous mutually unintelligible languages of Australia are connected with some of the ruder forms of speech of Timor, Ombay, &c., being also radically connected with each other. The extent to which they are other than Malay being greatly exaggerated.

In New Guinea, the Louisiade, New Ireland, &c., the languages are Papuan, mutually unintelligible to a great extent, yet related, and touching the Malay tongues in the Arru Isles.

The Tasmanian of Van Diemen's Land is perhaps more akin to the New Caledonian than to the Australian, as if the stream of population had gone round Australia rather than across it.

A Malay form of speech is spoken in Formosa. The languages of all the wilder tribes of the Peninsula of Malacca and the larger isles is, even when they are more or less black, Malay.—R. G. L.]

The *Andaman* language is inserted here for want of a better place only; it does not appear to have any connection with the Sanscrit, and may possibly be found to be more like that of Madagascar: the people seem to belong to the Papuas, a distinct original race, according to Dr Leyden, black, and with woolly hair.

[The Andaman is nearest the languages of the opposite coast, i.e., the Burmese.—R. G. L.]

Besides the numerous translations into languages of the Indo-European class, the Baptist missionaries have also printed some Armenian and Persian works at the indefatigable press of Serampore, which is supplied by a letter-foundry and a paper-mill, belonging to the same establishment, enabling them to execute the whole business at less than half the expense of European books of the same magnitude. The little pamphlet already quoted contains also specimens of the characters of the Sanscrit, Assam, Bengalee, Mahratta, Sikh, and Cashmirian, which somewhat resemble each other in the square form of their characters; as well as of the Burman, Orissa, Telinga, and Cingalese, which have a more rounded and flourished appearance; of the Tamul, which looks a little like Armenian; of the Afghan and the Persian used in India; and of the Chinese, both as printed from blocks, and from the moveable metal types which have been cast at Serampore.

6. The connection of the *MEDIAN* family with the Sanscrit on one side, and with the Greek and German on the other, is sufficiently proved by the words *Abitap*, Zend. Sun; Sansc. *Abitaba*. *Dar*, Ter, Pers. Door; Sansc. *Dura*, *Tuvara*; Javanese, *Turi*; Gr. *Thira*; Germ. *Thür*, *Thor*. *Dip*, Pers. Land or Island; Sansc. *Dihp*. *Dochtar*, Pers. *Pothré*; Zend. *Daughter*; Gr. *Thügater*; Germ. *Tochter*; Sansc. *Putri*. *Jaré*, Zend. Year; Sansc. *Jahran*; Germ. *Jahr*; and *Ishk*, Zend. Love; Sansc. *Itsha*. To this list we may add, from Dr Leyden, *Stree*, Zend. Woman; Sansc. *Stri*. *Asié*, Zend. He is; Sansc. *Asi*; Gr. *Esti*. *Hapté*, Zend. Seven; Sansc. *Saptah*; Gr. *Hepta*. There are also some coincidences with the Chaldee, but the Median is certainly not a dialect of the Chaldee. Sir W. Jones and others have said that the Zendish was nearest to the Sanscrit, and the Pehlvi to the Chaldee or Arabic. In ancient Media, the *Zendish* was the language of the northern, and the *Pehlvi*, or *Parthian*, of the southern parts; the word Pehlvi, or Pahalevi, is supposed by Leyden to have been nearly synonymous with Pali or Bali, though this is said to be derived from Bahlika, an Indo-European country. The Zendish was more particularly appropriated to religious purposes, and the Pehlvi had in a great measure superseded it for common use at a very early period. Under the Sassanides, again, from the third to the seventh century, the use of the Pehlvi was discouraged, and the old Persian substituted for it. It is said, however, that in the remote parts of the country, about Shirwan, some traces of the Pehlvi may still be found

in existence. The *Zendavesta* of Zoroaster, which is still extant in Zendish, is said to have been written 520 years B.C.; and Adelung follows Anquetil in asserting its authenticity, even in opposition to the opinion of Jones and Richardson. These languages have little or no connection with the Georgian and Armenian, which have succeeded them in some of the same countries. The old Persian, which seems to be much connected with the Pehlvi, has remained in use, either as a living or as a learned language, ever since the time of the Sassanides: it was current among the Persians when they were conquered by the Arabs in the seventh century; and it is the language of the *Shah Nameh* of Firdusi, written in the tenth century, as well as of the *Ayeen Akbery*, of which the date is about 1600. The modern *Persian* became a cultivated language about the year 1000, having received a considerable mixture of Arabic and Turkish words. The term *Parsee* is commonly applied to a corrupt Pehlvi, spoken by the refugee fire-worshippers in Bombay.

The Goths are said to have inhabited, for some centuries, the countries about the Black Sea, and may originally have bordered on Persia. From this circumstance, and probably also from the effects of a later irruption of the Goths into Persia, which is recorded in history, we may easily explain the occurrence of many Persian words in German, and in the other languages of Northern Europe. Professor Adelung has examined more than two hundred cases of such resemblances, and has found only one sixth part of them in Anquetil's vocabularies of the more ancient dialects. He has, however, omitted to state what proportion the whole magnitude of these vocabularies bears to that of a complete dictionary of the language. It is well known that an essay was published a few years since in London, *On the Similarity of the Persian and English Languages*; and a more elaborate work on the relations of the Persian languages, by M. Lepileur, has since appeared in Holland. M. Lepileur attempts to explain the *is* or *s* of the genitive of the northern languages by the Persian preposition *ez*, which seems to be synonymous with the Greek and Latin *ex*; but he has not shown that this *ez* ever follows the noun to which it relates.

The *Kurds* speak a corrupt dialect of the Persian; they are probably derived from the Carduchi of the Greeks, who inhabited the Gordiæan Hills. They spread into Persia about the year 1000, and are now situated on the borders of the Persian and Turkish dominions. The language of the *Afghans*, about Candahar, is said to contain about one-fourth of Persian, and some Tartarian, besides the Sanscrit which abounds in it.

[The term *Median* appears to mean the languages allied to either the Zend or the modern Persian; and as few writers (of which, however, the present is one) hesitate to derive the latter from the former, this meaning may stand; subject, however, to future correction.

Zend is so akin to the Sanscrit, that a class of any convenient magnitude must contain both. If so, their descendants should be in the same class also, viz., the modern Persian and the North Indian dialects. The complications and difficulties that arise out of this are considerable.

The Zend is the language of the *Zendavesta*; and closely allied to it is that of the Cuneiform inscriptions.

The Pehlvi is the language of the Sassanian inscriptions.

It is safer to write thus than to distribute the languages thus named geographically.

There are difficulties in deriving the modern Persian from the Zend, and there are difficulties in not doing so. In the mind of the present writer, the former outweigh the latter. Suppose that, after the Macedonian kingdom of Ilætria was formed, the successors of Alexander had extended their conquests into Tibet; that they filled the country with inscriptions in Macedonian Greek, and that a Greek literature was developed. Time goes on, and the Greek language changes. It takes in some words from the original Tibetan; it gives more, say thirty, forty, fifty per cent. Meanwhile, the original monosyllabic and uninflected character of the native language is preserved. Modern scholars investigate it; they note the number of Greek words; they note, too, the absence of the Greek inflections; they infer that the Tibetan is a language of Greek origin, being once, but now no longer, inflectional; just like the English

language. as compared with the Anglo-Saxon; or the Italian as compared with the Latin.

All this is wrong. The non-inflectional character of the Tibetan arises, not out of the facts of inflections having been lost, but out of the fact of their never having been developed. Nevertheless, a historical series of changes that never existed is inferred.

The real relation of the Greek to the Tibetan is that of the Latin (not the Anglo-Saxon) to the English. The real history of the want of inflections is the opposite of the one assumed. A change from the inflected to the uninflected stage of a single language is simulated. The actual fact is the incorporation of a large (say an inordinately large) percentage of words from a polysyllabic to a monosyllabic tongue.

Write Zend for Greek, and Persian for Tibetan, and the modern language of Ispahan and Teheran appear as descendants from the Zendavesta and arrow-headed forms of speech. Apply the criticism suggested by the erroneous character of the preceding inference, and this affiliation becomes doubtful. Such criticism, however, has yet to be applied.

Mutatis mutandis, the same applies to relations of the Sanscrit to the North Indian dialects.

The Biluch is Persian.

The Afghan belongs to the same class.

Again, an important group, that by slightly raising the value of this class can be referred to it, or (if this be inconvenient) may stand as a closely allied order, is one for which our data are quite recent. It contains the languages of some of the northern tribes of Afghanistan, the Kohistan of Cabul, Kaferistan (Siaposh), the head waters of the Oxus, Chitral and Hunz-Nagor. The present writer has called this the Paropamisian group.

The present writer, holding that the comparative absence of inflections of the Persian arises not from loss, and from non-development (the same applying to the North Indian forms of speech), stands perhaps alone in placing it, with its congeners, in immediate connection with the monosyllabic languages,—the Zend and Sanscrit (the *apparent* mother-tongues) being widely separated from them, though closely allied to each other.

If this be true, the Indian tongues are those where the basis is Tamul rather than monosyllabic; the Persian those where it is monosyllabic rather than Tamul.

More, however, will be said about this in the sequel; also something about the Goths.—R. G. L.]

7. The ARABIAN family is called by the German critics *Semitic*, from Shem the son of Noah, as having been principally spoken by his descendants. Though not intimately connected with the European languages, it is well known to have afforded some words to the Greek and Latin; it has also some in common with the Sanscrit, though apparently fewer than either the Greek or the German. Thus we have *Áter*, Heb. a Husbandman; *Ager*, Lat. a Field. *Asther*, a Star; Gr. *Aster*. *Bara*, *Buri*, Germ. Burg. *Ben*, Heb. Son; Sansc. *Bun*, Child. *Esh*, Heb. *Eshta*; Chald. Fire; Sansc. *Aster*. and *Ish*, Heb. Man; Sansc. *Ishá*, Man or Lord. The Hebrew *Ani*, *Anoki*, I, has been noticed by Townsend and others as affording an etymology for *Ego* as well as *Ni* or *Mi* of verbs, for the *Anok* of the Egyptians, and even for the *Ngo* of the Chinese.

The northern nations of this family have sometimes been comprehended under the name *Aramaic*, in contradistinction to the middle or Canaanitish, and the southern or Arabian. The Eastern Aramaic, or old *Chaldee*, is very little known; it was the language of a people situated in the north of Mesopotamia, which is now the south of Armenia; a part of them extended themselves further south, and became Babylonians, of whose dialect some traces are said still to exist about Mosul and Diarbeker. The old Assyrians, between the Tigris and Media, were a colony of the Babylonians, and spoke a language unintelligible to the Jews (2 Kings xviii.) The Western Aramaic has become known, since the Christian era, as the Syriac, in which there is an ancient and valuable translation of the *New Testament*. It is still spoken about Edessa and Harran. The Palmyrene was one of its dialects; the modern *Assyrian* of the Russian vocabularies appears to be another.

The language of the Canaanites is said by St Jerome to have been intermediate between the Hebrew and the Egyptian. The people are supposed to have come originally from the

Persian Gulf; the Philistines, who were found among them to have emigrated from the Delta to Cyprus, to have been thence expelled by the Phœnicians, and to have adopted the language of the Canaanites when they settled among them. The book of Job is considered as affording some idea of the dialect of Edom; it is well known to contain many Arabisms, besides some other peculiarities. The *Phœnician* is only known from a few coins and inscriptions found chiefly in Cyprus and in Malta, and not yet very satisfactorily deciphered; though Akerblad is convinced, by some of them, that it varied but very little from the Hebrew; of its descendant, the *Punic*, or Carthaginian, a specimen is preserved in the speech of Hanno in Plautus, as happily arranged by Bochart; the objection of Adelung, respecting the want of a proper name, appearing to have arisen from a mistake. The last six lines of the text are probably either a repetition of the same speech in the old Libyan of the neighbourhood, or a jargon intended to imitate it.

The *Hebrews* originated among the Chaldeans, Terah, the father of Abraham, having been a native of Ur, or Edessa, beyond the Euphrates. They adopted the language of the Canaanites, among whom they led a nomadic life, till their residence in Egypt, which must probably have had some effect in modifying their language. After that time, however, it appears to have varied but little in a period of 1000 years, from Moses to Malachi; and this circumstance Adelung considers as so uncommon and improbable, that he is disposed to believe that the writings of Moses must have been modernized at least as late as the time of Samuel. The old Hebrew became extinct, as a living language, about 500 B.C.; 1000 years afterwards the Masoretic points were added, to assist in its pronunciation: and this was done in some measure upon the model of the Syro-Chaldaic, which at that time was still spoken. The Septuagint version, which is much older, supports, in the instances of many of the proper names, the reading indicated by the points; but in about as many others it appears to deviate from that system, and to agree with a mode of pronunciation founded upon the text or principal characters alone. The reading in Greek letters of Origen, in his *Hexapla*, tends, on the whole, very strongly to support the points. The *Chaldee* had superseded the Hebrew at the time of the captivity, and was gradually converted into the *Syro-Chaldaic*, which is called Hebrew in the New Testament. The Targums, and the Talmud of Babylon, are in the older Chaldee; and a Syro-Chaldaic translation of the New Testament has been discovered to be still in existence.

The *Samaritan* somewhat resembles the Chaldee. It was formed among the Phœnicians and others, who occupied the habitations of the ten tribes when they were carried into captivity by Salmanassar and Esarhaddon. Its peculiar alphabet is well known as a mere variation of the Hebrew.

The *Rabbinical* dialect was principally formed in the middle ages, among the Spanish Jews, who were chiefly descended from the inhabitants of Jerusalem; while those of Germany and Poland were generally Galileans, and spoke a ruder dialect of the Hebrew than the fugitives from the metropolis.

The *Arabs* have been a distinct, and, in a great measure, an independent nation, for more than 3000 years. Some of them were descended from Shem; others, as the Cushites, Canaanites, and Amalekites, from his brother Ham. Their language, as it is found in the Koran, contains some mixture of Indian, Persian, and Abyssinian words. Its grammar was little cultivated until a century or two after the time of Mohammed. It is certainly copious; but its copiousness has been ridiculously exaggerated and absurdly admired. The best Arabic is spoken by the upper classes in Yemen; in Mecca it is more mixed; in Syria corrupt, and still more so in some parts of Africa. There are dialects which require the assistance of an interpreter to make them intelligible; at the same time, it has been maintained by Atyda, a learned Arab of Syria, in contradiction to Niebuhr, that the Arabic of the Koran is still employed in conversation among the best educated of the people, as well as in correct writing. The *Atabís* living in houses are called *Moors*, and those of Africa are the best known under this name. The *Mapuls* or *Mapulets* of Malabar and Coromandel are a numerous colony of Arabs, who have been settled there above a thousand years.

Language.

The *Ethiopians* are descended from the Cushite Arabs. In the time of Nimrod they conquered Babylon; before that of Moses they emigrated into Africa, and settled in and about Tigri; in Isaiah's time they seem to have extended to Fez; and at present they occupy Tigri, Amhara, and some neighbouring countries. They became Christians in 325, but retained the initiatory ceremony of the Jews and Mussulmans. The pure or literary Ethiopic is called *Geez*, or *Axumitic*, in contradistinction to the Amharic, by which it was superseded as the language of common life in Amhara about the fourteenth century, although it is still spoken, without much alteration, in some parts of *Tigri*; while in others, as in *Hawusa*, a different dialect is spoken. The Ethiopic was first particularly made known in Europe by the elaborate publications of Ludolf. Mr Asselin has since procured a translation of the whole of the Bible into the Amharic, as it is now spoken at Gondar; it was executed by the old Abyssinian traveller who was known to Bruce and to Sir William Jones, and was afterwards put to press at the expense of some of the British societies.

The *Maltese* is immediately derived from the modern Arabic, without any intervention of the Punic. The island, having been successively subject to the Phœacians, Phœnicians, Greeks, Carthaginians, Romans, and Goths, was subdued by the Arabians in the ninth century; in the eleventh the Normans conquered it; and it remained united with Sicily until it became in some measure independent, under the Knights of St John.

[There is nothing to be subtracted from this group. In the way of addition, it contains the *Gafat* of Ethiopia.]

The *Semitic* tongues graduate into the other African tongues by means of a class for which the name *Sub-Semitic* has been suggested, containing—

1. The *Coptic* of Egypt, which has affinities with the *Bisharye*, the *Nubian*, and the *Galla*.

2. The *Amazirgh* or *Berber* tongue, leading to the *Bornu*, *Haussa*, and other languages of Central Africa.

3. The *Agow* and other allied tongues of Abyssinia. These are, perhaps, absolutely Semitic.—R. G. L.]

8. The *LYCIAN* is only known from a few short inscriptions copied by Mr R. Cockerell, and published in Mr Walpole's collection, together with two or three longer ones, which have been lately brought from Antiphellos by the enterprising and indefatigable Mr W. J. Bankes. By means of a proper name in one of Mr Cockerell's inscriptions we obtain a part of the alphabet; thus *i* is *A*; *Δ*, *D*; *E*, *I*; *P*, *R*; *Σ*, *S*; and probably *Λ*, *H*; and *ι*, *L*. A further comparison of the different parts of the other inscriptions with the Greek phrases that almost uniformly accompany them, implying "FOR HIMSELF AND HIS WIFE AND CHILDREN," gives us the words *A*, or *AT'-HI*, *himself*; *SA*, *his*, or *for his*; *HRDI*, or perhaps *HRDI*, *wife*; *TIDAIMI*, *son*; *TIDAIMA*, *children*; and *ATBI*, *and*. It does not appear that any of these words would authorize us to place the *Lycian* language as a member of the great Indo-European class; but it is reported to have been much mixed with Greek, and, on account of its geographical situation, it may be allowed to occupy a temporary rank between the principal oriental and European languages. If it has a shadow of likeness to any other language, it is perhaps to the *Cimbric*; and *Tidaimi* may also possibly be allied to the Greek *Titheno*, to nurse.

9. Respecting the ancient *PHRYGIAN*, we have a few traditions only, which at least agree in giving it a high antiquity, as the source of several Greek words. Thus, Plato observes, in his *Cratylus*, that the terms denoting *fire* and *water* are not derived from any other Greek words, but are Phrygian primitives. It seems, however, that water was called *Bedu* by the Phrygians, and the word resembles the *Bada*, *Bath*, of the northern nations, as well as the *Vate*, water, of the Swedes. *Moirai*, the fates, derived from the Phrygian, is compared to *Meyar*, virgins, of the Gothic; and *Bek*, bread, is as much like our *Bake*, as like the Albanian *Buk*, bread.

10. The *GREEK* has no very intimate or general connection with any of the older languages which have been preserved entire, although there are a number of particular instances of its resemblance to the Sanscrit, some of which have been already mentioned; it has also many German and Celtic words, some

Slavonian, and, as it is said, a few Finnish. It can only have been immediately derived from the language of the neighbouring Thracians and Pelasgians, who seem to have come originally from the middle of Asia, through the countries N. of the Black Sea, and to have occupied not only Greece and Thrace, but also the neighbouring parts of Asia Minor, where they probably retained their ancient dialect to a later period than elsewhere. The whole of the Thracian states were greatly deranged by the expedition of the Celts in 278 B.C. which terminated in their settling the colony of Galatia. The Dacians, or Getæ, who principally occupied Bulgaria, extended themselves further northwards, and afterwards constituted the Roman provinces of Mœsia and Dacia, which were conquered by the Goths in the third century. The Macedonians, in the time of Alexander, spoke a language which was nearly unintelligible to the Greeks in general; even the Pelasgi in Epirus and Thessaly long retained a dialect materially different from their neighbours, and in Arcadia still longer. The Hellenes, who emigrated from Asia Minor into Greece, were not sufficiently numerous to carry their own dialect with them, although the language assumed their name. The Græci in Italy were Pelasgians, although Dionysius of Halicarnassus includes them in the denomination Hellenic; their language must have been *Æolo-Doric*, and it was in this form that the Latin received its mixture of Greek; the Lacedæmonian also retained it till a late period, writing, for instance, instead of *Pais*, *I'oir*, as in Latin *Puer*. The *Æolic* appears once to have extended over Attica, and to have left some *Æolisms* in the old Attic dialect. This dialect was the principal basis of the common language of Greece at a later period, which must have been the most cultivated under the protection of the court of Alexandria, and which continued to be spoken and written in the highest circles of Constantinople throughout the middle ages. By degrees it degenerated into the modern *Romaic*, having received a mixture of Turkish and Italian, and perhaps of some other neighbouring languages.

11. The *GERMAN* family is sufficiently connected with a variety of others belonging to the Indo-European class to be admitted into it upon a very short investigation. Its resemblances to the Greek, within the compass of the Lord's Prayer, besides Father and Name, are *Wille*, *Wollen*, Gr.; *Brot*; perhaps *Brot* or *Proat*, bread, like *Arτος*; and *Freyen* or *Lösen*, like *Rhûein* and *Lûsein*. Dr Jamieson has shown very clearly, in his *Hermes Syglicus*, how immediately the structure of the Gothic languages is derived from that of the Greeks. Thus the *EN* of the Greek infinitive became in the *Mæso-Gothic* *an* or *ian*, in German *en*. The *ICOS* of the adjectives, *Mæso-Gothic*, *ags*, *igs*, or *egos*, as *mahtēigs*, mighty, Germ. *machtig*; the Slavonians have *ski*, the Swedes *sku*. The *INOS*, Lat. *ENUS*, Anglo-Saxon *FN*. The *LICOS*, Latin *LIS*, German *LICH*, English *LIKE*; thus *pelicos* is *what like*, at least in Scotland; the *Mæso-Gothic* *swaleiks* is our *such*; *samaleiks* is *similis*. *LOS*, *LIS*, *LION*, of diminutives, in Latin *LUS*, becomes in *Mæso-Gothic* *ilo*, as *barnilo*, a little child; in German *mannl* is a little man. Among the pronouns we have *ego* in Greek and Latin, *Mæso-Gothic* *ik*, Icelandic *eg*, Swedish *jag*; *emou*, *mov*, Gr., Latin *MEI*, *Mæso-Gothic* *MEINA*, German *MEINER*; *emoi*, *moi*, Latin *MIHI*, *Mæso-Gothic* *MIS*, Swedish *mig*, Dutch *my*; *emv*, *me*, Latin *ME*, *Mæso-Gothic* *MIK*, Anglo-Saxon *ME*, Dutch *my*. *Su*, Doric *TU*, Latin *TU*, *Mæso-Gothic* *THU*. *Is* in Latin, *Mæso-Gothic* *is*; *esv*, *Mæso-Gothic* *is*, *izos*; *id*, *Mæso-Gothic* *ITA*, English *IT*. *Quis*, *cujus*, *cui*, *quem*, *Mæso-Gothic* *quias*, *quins*, *quie*, *quiana*, the last having the *N*, as the Greek *NON*. *UTER*, *whether*, *ALTER*, *other*, seem to be derived from *ANTHER*, *ENTHERA*, meaning *one of them*, so that in this instance the Gothic has the appearance of the greater antiquity, while the Greek affords, on the other hand, an etymology for *EXTEROS*, from *EXEI*, *there*, which is wanting to the *Mæso-Gothic* *GAINS* or *JAINS*, the *Alemannic* *GENER*, the German *JENER*, and the English *YONDER* or *YON*. Again, among the numerals, *DEKA* has been derived from *DEO*, as if both hands were tied together; and *FINTE* has a strong resemblance to *PANTA*, as if *all* the five fingers were reckoned; and, on the other hand, *da cuig* in Gaelic, meaning twice five, has been considered as the original of *DECA*. But none of these etymologies seems to be so decisive of originality as that of *caterva*, which is evidently related to *turba* or *turma*, while the first syllable remains unexplained in Latin; but in the

Language.

Language. Celtic we have *cad tarf*, or *cath tarf*, a war troop, agreeing undeniably with the sense. For another example, we may take *ventus* and *wind*, for which we find no Latin etymology, while the German furnishes us with *wehen*, to blow, and thence *wehend* and *wind*. The words *nodus* and *knot* afford also a similar instance; *nodus* having nothing nearer to it in Latin than *neo*, to spin, *necto*, to unite; but in German we have *knutten*, to join, and in English *knit* and *knead* from the same root. The degrees of comparison are expressed in Greek by *EROS* and *ISTOS*; in Anglo-Saxon by *ER* or *ERA*, and *IST* or *AST*. *Er* seems to mean *before*, as well as the Latin *or*. The Coptic has no comparative; but for *better than I*, the Egyptians said *very good before me*. It would seem at first sight natural to make *than* a preposition, as well as *before*, and to say *better than me*; but the fact is, that in English, as well as in German, it was usual of old to say *then or denn* in this sense; and *he is wiser than I* meant only, *he is wise before, then I follow*. The idea of time or place is now dropped as unessential to the kind of priority in question, but the ground of the grammatical construction remains unaltered. In Mæso-Gothic the comparative termination is *izo* or *ozo*, the superlative *ists* or *ista*; thus the Greek *MEIZON* becomes *MEIZO*, and *MAISTOS* is obviously *MEIGISTOS*. The old *megalos* is *mikils*, mickle or muckle; and *minor*, *minimus*, became *minnizo*, *minnists*; in Persian, *mih* is great, *mihter*, greater, *mihtaras*, greatest; *better* seems to be from the old German *bied* or *bieder*, upright, honest, and resembles the Persian *bihter*, *better*. The Mæso-Gothic verbs have also some striking resemblances in their form to the Latin; thus the present tense of *to have* is *HABA*, *HABAIS*, *HABAITH*; *HABAM*, *HABAITH*, *HABAND*. *HABUIT* is *HABAIDA*; *HABENS*, *HABANDS*; *HABENTIS*, *HABANDIS*; *HABENTEM*, *HABANDAM*; *HABENTES*, *HABANDANS*. The substantive verb singular in Greek is *EIMI*, *EIS*, *ESTI*; the plural in Latin *SUMUS*, *ESTIS*, *SUNT*: the Mæso-Gothic has *IM*, *IS*, *IST*, *SIMJUM*, *SIJUTH*, *SIND*; and *SIS* is *SIJAIS*; *ESSE*, *WISAN*. The Mæso-Gothic nouns frequently retain the resemblance of the Greek more strongly than their more modern derivatives; thus a *TOOTH* does not seem to point very immediately to *DENTEM* or *ODONTA* as its source; but the older form *runthu* is clearly the intermediate stage of this modification; and numberless other instances of the same kind might easily be found.

The Germans were known, as early as the time of Pytheas, that is, 320 B.C., as consisting of the Jutes in Denmark, the Teutones on the coast to the east of them, the Ostiæans next, and lastly the Cossini, Cotini, or Goths. Professor Adelung imagines that the eastern nations, or Suevi, employed almost from the earliest times a high German dialect, and the western, or Cimbri, a low German; the Suevi he supposes to have been driven, at a remote period, into the south of Germany by the Slavonians; and some of the Goths appear to have extended as far as the Crimea. The *Bible* of Ulfila, in the Gothic or Mæso-Gothic of 360, is the oldest specimen in existence of the German language. Besides the Greek and Latin, which appear to prevail so much in the language, it exhibits a considerable mixture of Slavonian and Finnish; the translation is far more literal than it could be made in any of the more modern dialects of the German, and sometimes appears to follow the text with somewhat too much servility.

The modern *German*, founded on the higher dialects of Saxony, was fixed and made general by Martin Luther. There are many shades of dialect and pronunciation in the different parts of this diversified country, but none of them of any particular interest, or established by any literary authority. There are still some German colonies in the territories of Vicenza and Verona, called the *Sette Comuni*, which retain their language. The German Jews have a peculiar jargon, borrowed in some measure from their brethren in Poland, which they write in Hebrew characters; and another similar mixture of discordant dialects is spoken by the Rothwelsch, a vagabond people in the south of Germany, who have sometimes been confounded with the Gipsies.

The *Low Saxon*, or *Platt Deutsch*, is spoken about Halberstadt, and farther north, in the countries between the Elbe and the Weser; it seems to be intimately connected with the Frieslandish and *Dan sh*, as well as with the English. The *Frieslanders* originally extended from the Rhine to the Ems, and the Cauchi, thence to the Elbe; these countries still retain a

dialect materially varying from those of their neighbours. **Language.** The Brokmic laws of the thirteenth century exhibit some remarkable differences from the German of the same date: thus we find in them *Redieva*, a judge, or *Reeve*, instead of *Richter*; *Kenne*, kin; and *sida*, side, as in Swedish, instead of *seite*. The Batavian Frieslandish approaches very much to the English; it has several sub-dialects, as those of *Molkwer* and *Hindelop*. Some of the Cauchi Frieslanders remain in the territory of Bremen; the North Frieslanders occupy Heligoland, Husum, and Amröm.

The *Dutch language* is a mixture of Frieslandish, Low Saxon, and German, with a little French. It appears, from Kolyn's *Chronicle*, to have been distinctly formed as early as 1156.

The Scandinavian branch of the Germanic family is characterized by the want both of gutturals and of aspirates, which renders its pronunciation softer and less harsh; and by some peculiarities of construction, for instance, by the place of the article, which follows its noun, both in *Danish* and *Swedish*, instead of preceding it, as in most other languages. The name of Denmark is first found in the ninth century; until the sixth the people were called Jutes. *Norway*, in the ninth century, was termed *Nordmanland*. A corrupt Norwegian is still, or was lately, spoken in some of the *Orkneys*, which were long subject to Norway and Denmark. In the eastern parts of *Iceland*, the language is much like the Norwegian; but, on the coast, it is mixed with Danish. The oldest specimen of Icelandic is the *Jus Ecclesiasticum* of 1123. The term *Runic* relates to the rectilinear characters cut in wood, which were sometimes used by the Scandinavian nations. The *Swedes* are derived from a mixture of Scandinavians with Goths from Upper Germany, but their language does not exhibit any dialectic differences corresponding to this difference of extraction. Mr Townsend has given us a list, from Peringskiöld, of 670 Swedish words resembling the Greek; but it must be confessed that the resemblance is in many cases extremely slight.

The *Saxons* are mentioned by Ptolemy as a small nation in Holstein, whence, in conjunction with the Frieslanders, and the Angles of South Jutland, they came over to England about the year 450. The Saxons settled principally south of the Thames, the Angles north. At the union of the Heptarchy, the Saxon dialect prevailed, and the English, which nearly resembled the Danish of that time, was less in use; but new swarms of Danes having inundated the north of England in 787, the Danish dialect was introduced by Canute and his followers; and it is about this period that our earliest specimens of the Anglo-Saxon are dated. The Saxon dialect again obtained the ascendancy under Edward the Confessor; and although some French was introduced by this prince, and still more by William the Conqueror, into the higher circles of society, the courts of law, and the schools, yet the use of the French language never became general among the lower classes, and the Saxon recovered much of its currency in the thirteenth century, when the cities and corporate towns rose into importance under Edward the First. In the fourteenth century it was permanently established, with the modifications which it had received from the French; and it may be considered as truly English from this period, or even somewhat earlier, at least if Pope Adrian's rhymes are the genuine production of 1156. It is still much more German than French; in the Lord's Prayer, the only words of Latin origin are *trespass*, *temptation*, and *deliver*. Professor Adelung's remarks on the simplicity of the English language appear to be so judicious as to deserve transcribing: "The language," he observes, "only received its final cultivation at the time of the Reformation, and of the civil disturbances which followed that event; nor did it acquire its last polish till after the Revolution, when the authors who employed it elevated it to that high degree of excellence, of which, from its great copiousness, and the remarkable simplicity of its construction, it was peculiarly capable. It is the most simple of all the European languages; the terminations of its substantives being only changed in the genitive and in the plural, and the alterations of the roots of the verbs not exceeding six or seven. This simplicity depends, in some measure, on a philosophical accuracy, which is carried systematically through the whole language, so that the adjectives, participles, and article, are indeclinable, being in their nature destitute of any idea of gender, case, or number, and the form of a generic distinction

Language. is [almost entirely] confined to objects which are naturally entitled to it. The pronunciation, on the other hand, is extremely intricate; and foreign proper names, in particular, are much mutilated whenever they are adopted by the English."

12. The Celtic family forms a very extensive and very interesting subdivision of the Indo-European class. It has been asserted by some writers, "That the six original European languages, the Iberian, Celtic, Germanic, Thracian, Slavonian, and Finnish, were just as distinct at the beginning of their history as they now are;" but this assertion must be subjected to considerable modification. The thing is in itself so improbable as to require far more evidence than we possess to establish it, even if that evidence were of a more decisive nature; and, in fact, it will actually be found, upon a comparison of the Gothic of Ulphila with the modern dialects, that the Germanic of that day did approach more nearly, both to the Celtic and to the Thracian or Greek, than any of its more modern descendants do. The change of *tunthu* into *tooth*, for which the Germans have *zahn*, has already been noticed; the *atta* and *himina* of Ulphila seem to be more like the Irish *At'air* and *Neamh* than the modern *Vater* and *Himmel* are; and the Mosso-Gothic *vair*, which answers to the Cimbric *FEAR*, a man, is not at present found in German, though its traces may still be observed in the *Firiobarno* of the Franks in 1020: the antiquity of the root is shown by the Celtic names in Cæsar beginning so often with *ver*, and still more strongly by the testimony of Herodotus, that the Scythian called a man *αἰορ*. At the same time, therefore, that we admit the propriety of considering the Celtic and Germanic as families clearly distinct, with respect to any period with which we are historically acquainted, we must not forget that they exhibit undeniable traces of having been more intimately connected with each other, and with their neighbours, in the earlier stages of their existence. The resemblances of the Celtic to the Latin are too numerous to require particular notice, the immediate and extensive connection between these languages being universally admitted; but if any evidence were desired on this subject, it might be obtained in abundance, by a reference to Court de Gebelin's *Monde Primitif*. With respect to the Greek, the terms *Hael*, sun; *Dur*, water; *Deru*, oak; *Garan*, crane; *Crunn*, ice, are among the Celtic words of the most indisputable originality; and their resemblance to *Helios*, *Hüdor*, *Drüs*, *Geranos*, and *Crüoen*, is equally undeniable. We find, also, in the Cimbric, *Bas*, low, connected with *Bathüs*, *Bara*, bread, perhaps with *Bora*, food; *Dayrnas*, kingdom, with *Türannis*; *Dyro*, give, with *Doreue*; *Gogoriant*, glory, perhaps with *Gauriaon*, exulting. With the German it is easy to find a number of very near approaches to identity, even in that Celtic which can be proved, principally from the etymologies of proper names, to be prior to the date of any known or supposed secondary intercourse or mixture of the natives concerned. Thus we have, either accurately or very nearly in the same signification, *Ap*, *Affe*, or *Ape*; *Barra*, *Barre*; *Bleun*, *Blume*; *Bolgan*, *Balge*; *Brig*, *Berg*; *Brogil*, *Brühl*; *Carra*, *Karre*; *Doga*, *Teich*; *Galb*, *Klab*; *Garan*, *Kranich*; *Gnabat*, *Knabe*; *Lancea*, *Lanze*; *Marc*, *Mähre*; *Marga*, *Märgel*; *Redya*, *Reiten*; *Rit* or *Rat*, *Rad*; and *Ur*, *Auer*; and it is impossible to suppose that so numerous a series of coincidences can have been derived from accidental causes only.

The Celts may be imagined to have emigrated from Asia after the Iberians or Cantabrians, and before the Thracians or Pelasgians, settling principally in Gaul, and spreading partly into Italy, under the name of Ausonians and Umbrians. In 570 B.C. they undertook expeditions for the purposes of conquest, but they were subdued by the Romans. Their language was current in Gaul till the sixth or seventh century, when it was superseded by the rustic Roman, which by degrees became French; in Ireland and Scotland it has remained with few alterations; in Wales and Brittany it has been more mixed. The Gauls must have peopled Britain at least as early as 500 B.C. The true ancient Britons are the Highlanders of Scotland only, having been driven northwards by the Cimbri: they still call their language Gaelic. The Irish are probably derived from these Highlanders; they were originally termed Scots or Scuits, that is, fugitives, from the circumstance of their expulsion from Britain; so that, where the Scots are mentioned before the tenth century, as by Porphyry in the

third, we are to understand the Irish. Gildas, in 564, sometimes calls them Scotch and sometimes Irish. After the retreat of the Romans from Britain, a part of them re-entered Scotland about the year 503, and changed its name from Caledonia to Scotia Minor. In 432 St Patrick laid the foundation of the civilization of Ireland; and, in the seventh century, several Irish priests undertook missions to the continent. At the beginning of this century some Scandinavian freebooters had begun to visit Ireland; and in the year 835 they formed large colonies of emigrants, who established themselves firmly in that country, and in the Scottish islands, bringing with them many Gothic words, which became afterwards mixed with the Celtic, and which seem to constitute about one-fifth part of the modern Irish and Gaelic, 140 Gothic words being found under the first six letters of the alphabet only. Some of these Normen remained distinct from the Irish till the year 1102. The oldest specimens of the Irish language, admitted by the continental critics to be authentic, are of the ninth century, though some of our antiquaries have imagined they have discovered records of a much earlier date. The Gaelic of the Isle of Man is mixed with Norwegian, English, and Welsh. A Gaelic-colony formerly established at Walden, in Essex, has been placed by Chamberlayne in Italy, as a nation of *Waldenses*.

The Cimbric or Celto-Germanic language was remarked by Cæsar as differing from the Gallic, although the distinction has not always been sufficiently observed. The Cimbrians seem to have existed as a nation 500 to 600 years B.C.; the Gauls called them Belgæ; they invaded Britain a little before Cæsar's time, and drove the ancient inhabitants into the Highlands and into Ireland. Having called the Saxons to their assistance against the Scots and Piets in the fifth century, they were driven by their new allies into Wales, Cornwall, and Brittany. Their language is remarkable for the frequent changes of the initial letters of its radical words in the formation of cases and numbers; thus, from *Den*, a man, in *Britannish*, is derived the plural *Tud*; from *Vreg*, a woman, *Groages*. Almost half of the Welsh language seems to be German, and half of the remainder is perhaps Latin or Celtic; of the Britannie, about half resembles the Latin or French. Brittany was originally inhabited by the Armoricans; whether they were properly Belgæ or Gauls is uncertain. The country was named Britannia Minor, from the emigration of the British in 449; these new comers mixed with the original inhabitants, all speaking the same language, and in a few years became so numerous as to be able to send an army of 12,000 men to the assistance of the Emperor Anthemius.

Professor Adelung is disposed to consider the German portion of the different branches of the Celtic, which varies from one-fifth to one-half of the whole language, as an accidental mixture, and derived through different channels. But we cannot in all cases find any historical evidence of the existence of these channels; it is difficult, for example, to suppose that the Scandinavian incursions were able at any early period to influence the language of the Highlands of Scotland; and wherever it happens, as it frequently does, that no term is to be found, in the Irish, the Gaelic, or the Welsh, for expressing the same idea, besides the word that they all have in common with the German, it is scarcely possible to believe that there ever was any other Celtic word which has been so uniformly superseded by independent causes. We find, for instance, under the two first letters of the alphabet only, the words *Ap* or *Apa* in Irish, *Ap* in Welsh, *Affe* or *Ape* in Gothic; again, *Abul*, *Aful*, *Appel*; *Angar*, *Aneung*, *Enge*; *Bacail*, *Bach*, *Backen*; *Barrud*, *Barr*, *Bare*; *Beuir*, *Bir*, *Bier*; *Buail*, *Buic*, *Beil*; *Bocan*, *Buck*, *Bock*; *Brathair*, *Bravot*, *Bruder*; *Bul*, *Bula*, *Bulle*; and the same agreement is found in almost all other instances of German words that are detected in the Irish language.

The much-disputed question respecting the antiquity of the poems attributed to Ossian has an immediate reference to the history of the Celtic languages. It has been observed, with apparent justice, by Professor Adelung, who is not in general sceptical on such occasions, that if these poems were really very ancient, their language could not but exhibit marks of antiquity. There is an Irish *Leavre Lecan* at Paris, written in the thirteenth century, and scarcely intelligible to the best Irish scholars of the present day; the oldest Gaelic manu-

Language. scripts have also peculiar expressions no longer in use ; while the works supposed to be the productions of a period so much more remote are found to be in " excellent modern Gaelic, impressed with all the marks of the language of Christianity, and of that of the Norwegian invaders, whether these conquerors may be supposed to have influenced the Gaelic language immediately in Scotland, or by the intervention of Ireland." It must not, however, be forgotten, that these marks of Scandinavian intercourse are somewhat more ambiguous than Professor Adelung is disposed to admit ; and that a book written in the thirteenth century is more likely to have preserved the language in an antiquated form than poems so marvellously committed to memory, from continual recitation only, by people supposed to understand them, and of course imperceptibly modifying the expression without intending to alter them. But since an invasion from Lochlin, that is, Denmark or Norway, is actually mentioned in " *Fingal*," the author of the poem could certainly not have been older than the seventh or eighth century, if we are to credit the historical accounts of these invasions ; and since, in the poems discovered by Dr Matthew Young, St Patrick is introduced discoursing with Ossian respecting the Christian religion, we have an additional argument for denying that he was contemporary with Caracalla or Carausius, these emperors having both lived in the third century, and St Patrick in the fifth.

[It was shown by Dr Prichard that the Kelt tongues were allied to the German, Latin, Greek, Slavonic, and Sanscrit. Did this make them Indo-European? Not without raising the value of the class. How far this is legitimate has never been asked. Yet it ought to be asked wherever an addition is made. Unless it be done, classes take indefinite dimensions. B is connected with A, C with B, D with C, and so on, till classification defeats itself.—R. G. L.]

14. The ETRUSCAN is only known as the immediate parent of the Latin ; but it was written in a character totally different, and was read from right to left. Notwithstanding the industry and ingenuity of Lanzi, the evidence of the accuracy of his interpretations is somewhat imperfect. We should naturally have expected to find more words of a Celtic or Gothic origin, and not merely Greek or Latin words with the terminations a little varied, as *Ustite* for *Ustura*, *Tribo* for *Tribus*, and *Urte* or *Urtia* for *Heorte* ; still less should we have expected that the same sense should be expressed sometimes by a Greek and sometimes by a Latin word, as *Urtu* and *Puni* for Bread, *Capros* and *Feres* for a Boar. The Etrurians and Umbrians were originally a branch of the Celts from Rætia, as is shown by the similarity of the names of places in those countries, as well as by the remains of Etruscan art found in that part of the Tyrol ; they are supposed to have entered Italy through Trent, about the year 1000 B.C., and to have afterwards improved their taste and workmanship under the auspices of Demaratus of Corinth, who settled in Etruria about 660 B.C. (See ETRUSCANS.)

[The philological place of the Etruscan, as well the Lycian and Phrygian, has yet to be determined.—R. G. L.]

15. The LATIN language is placed at the head of a family, rather with regard to the number of its descendants than to the independence of its origin, being too evidently derived from the Celtic, mixed with Greek, to require particular comparison. The first inhabitants of Italy appear to have been Illyrians or Thracians, Cantabrians, Celts, Pelasgians, and Etrurians. Rome, from its situation, would naturally acquire much of the languages of these various nations, and at the same time much of the Greek from the colonies in the south of Italy. In the time of Cicero, the Italian songs, supposed to be about 500 years old, were no longer intelligible, even to those who sang them. We find, in an inscription still more ancient, and approaching to the time of Romulus, *Lases* for *Lares* ; and for *Flores*, *Pleores*, which is somewhat nearer to the Celtic *Bleun*. In the time of Numa, for *Hominem liberum*, we have *Hemonem lœbesom* ; we find, also, a *v* added to the oblique cases, as *Capited* for *Capite*, which, as well as the termination *ai*, in the genitive *aulai*, *pennai*, is taken immediately from the Celtic, and is even found in modern Gaelic.

The Latin remained in perfection but a few centuries. In the middle ages, a number of barbarous words were added to it, principally of Celtic origin, which are found in the glossaries of Dufresne and Charpentier. At the end of the seventh

century it began to acquire the character of Italian, as *Campo* Language. *divisum est* ; and, in the eighth century, in Spain, we find, as an example of its incipient conversion into Spanish, *Vendant sine pecho, de nostras terras*. The formation of the Italian language may be said to have been completed by Dante, in the beginning of the fourteenth century ; and it was still further polished by the classical authors who immediately succeeded him. It contains many German words, derived from the different nations who occupied in succession the northern parts of Italy, and some Arabic, Norman, and Spanish, left by occasional visitors in the south. It is spoken by the common people in very different degrees of purity. Among the northern dialects, that of *Friuli* is mixed with French and with some Slavonian. The *Sicilians*, having been conquered in succession by the Greeks, Carthaginians, Romans, Byzantines, Arabs, Normans, Germans, French, and Spaniards, have retained something of the language of each. *Sardinia* has given shelter to Iberians, Libyans, Tyrrhenes, Greeks, Carthaginians, Romans, Vandals, Byzantines, Goths, Lombards, Franks, Arabs, Pisans, and Aragonians ; and the proper Sardinian language is a mixture of Latin with Greek, French, German, and Castilian. Corsica has also been occupied by a similar diversity of nations ; its peculiar idiom is little known, but the dialect of the upper classes is said to approach nearly to the Tuscan.

Spain, after its complete subjugation by the Romans, enjoyed some centuries of tranquillity. The Vandals and Alans retained their power in Spain but for a short time ; the Suevi, on the N. coast, somewhat longer ; and from these nations the rustic Roman, which had become general in Spain, received some words of German origin. It derived, however, much more from the Arabic during the domination of the Moors, which lasted from the beginning of the eighth century to the end of the fifteenth ; and, at one time, the Arabic was almost universally employed throughout the country, except in the churches. The Spanish language advanced the most rapidly toward perfection during the height of the national prosperity which immediately followed the conquest of America. It was afterwards neglected, and again more particularly cultivated by the Academy of Madrid, in the eighteenth century ; as far at least as an academy can be supposed to have any influence in the modifications of a language.

The Portuguese is supposed to have received a mixture of French from the followers of Count Henry of Burgundy, under whom Portugal first formed a separate state in 1109 ; but the language is very different from that of the confines of France and Spain ; and the nasal vowels, which are remarkable in the Portuguese, differ materially from those of the French, or of any other nation. Many Latin words are retained in the Portuguese which are not found in any other modern language ; and it is remarkable that almost all the words of the language are contracted, by the omission of some of the radical letters of the originals.

The Rætians, in the country of the Grisons, were subdued by the Romans in the time of Augustus. They became part of the Alemannish kingdom, under Theodobert, in 539 ; their union with Switzerland took place in the beginning of the fourteenth century. Half of the Grisons speak the *Romanish* language, immediately derived from the Latin, though mixed with some German, which has been particularly made known by Mr Planta's account of it in the *Philosophical Transactions*. One-third speak German, with some mixture of Romanish words, and the rest a bad Italian.

France in the time of the Romans, was occupied by the Gauls, together with the Aquitanians, who were probably Cantabrians, and the Cimbrians or Belgians. From the rustic Roman, mixed with the languages of these nations, the Romance was gradually formed. In the fifth century, the Franks took possession of the north-eastern part of the country. They retained their language for some centuries, but by degrees it became mixed with the Romance and formed *French*, of which at least one-fifth is supposed to be of German origin, though many of the German words seem to have been admitted through the medium of the Italian. In the S. of France, the language remained more exempt from the influence of the German, under the name of the *Provençal* ; and the troubadours contributed, especially from the eleventh to the thirteenth century, to give it refinement and currency ; but, in later times, the *Langue*

Language. *d'oc* has prevailed over the *Langue d'oc*, which is now spoken by a few of the lowest class only.

The last and least genuine of the descendants of the Latin is the *Wallachian*, about one-half of which is borrowed from the German, Slavonian, and Turkish. The original Thracians of the country must have been in a great measure superseded by the successive settlements of various nations; in the third century, some of the Goths and Vandals; in the fourth, the Jazyges, after Attila's death; in the fifth, some Huns and Alans; about the end of the seventh, the Bulgarians, and afterwards the Petschenegers and Hungarians, established themselves in it; and, in the thirteenth century, Wallachia became an independent state. The Latin part of this language has much of the Italian form, and had even assumed it as early as the fifth century. It must have been derived from Roman colonies, and more lately, perhaps, from the missionaries sent into the country by Pope Gregory XI. The *Dacian* or Hungarian dialect prevails on the N. of the Danube; the *Thracian*, or *Cutzo-Wallachian*, on the S.; the latter is more mixed with Greek and Albanian. There is also a small Wallachian colony in Transylvania.

[For remarks on the Greek, Latin, and German, see below.—R. G. L.]

The *Cantabrian* or *Biscayan* has many words in common with the Latin, whether originally or by adoption, and was probably in some measure connected with the Celtic dialects, which were the immediate predecessors of the Latin, though still sufficiently distinct from them. The Cantabrian *Aita*, Father, has some resemblance to the Irish *At'air*, and the Mæso-Gothic *Atta*; *Geru* is not wholly unlike *Cælum*; *Ereenjaa*, *Regnum*; and *Borondatia*, *Voluntas*; the coincidence of *Gun*, Day, with the Tartarian, is perhaps more accidental. But the word *Lurre*, Earth, which seems at first sight so unlike any other language, is in all probability the derivative of *Tellure*; and this form of the word affords also a connecting link with the Irish *Talu*, and may have been contracted into the more common Latin word *Terra*; a supposition which seems to lessen the probability of the original connection of this form of the word with the Greek *Era*, and the Sanscrit *Stira*. The Biscayan is still spoken in the angles of France and Spain adjoining to the northern extremity of the Pyrenees. The same people were called Cantabrians in the N., and Iberians in the S., and extended between the Pyrenees and the Rhine, as Ligurians, or inhabitants of the coast. They have adopted a few German words, perhaps from the empire of the West Goths; and they have furnished the modern Spanish with more than a hundred original words of their own. The construction of the language is extremely intricate; its verbs have eleven moods, among which are a consuetudinary, a voluntary, a compulsory, and a penitentiary. Larramendi's *Grammar*, published at Salamanca in 1729, is called *El Impossible Vencido*. A valuable abstract of the most interesting particulars relating to the language is found in the *Additions to the Mithridates*, by the Baron William von Humboldt, late Prussian ambassador to the court of Great Britain, printed at Berlin, 1816. Dr. Young has lately remarked, in the *Philosophical Transactions* for 1819, that at least six of the words contained in Humboldt's vocabulary coincide very accurately with the Coptic, or ancient Egyptian, though they are not found in any of the languages of the neighbouring countries; and he infers that the chances are "more than a thousand to one, that, at some very remote period, an Egyptian colony established itself in Spain." It may be observed, that one of these words, *guchi*, little, appears to be also Turkish or Tartarian; so that it becomes a second instance of a coincidence between this language and the Cantabrian.

[The Bask has yet to be placed. It is nearer the Kelt than is generally admitted. At the same time, its African affinities are important. It is an eminently agglutinate language.—R. G. L.]

16. The connection of the Slavonian and Lithuanian, and of the other branches constituting the *SLAVIC* family, with the languages of the Indo-European class in general, is sufficiently established, without exceeding the limits of the Lord's Prayer, by the resemblance of *Nebi* or *Nehesi* to the Cimbric *Nefoedd*, and the Greek *Nephos*; and of *Wolja* and *Chljeb* to the Gothic *Wilja* and *Hlaif*. The Slavonians are the descendants of the ancient Sarmatians, who were situate N. of the Black

Sea and of the Danube. They were conquered by the Goths, and then driven by the Tartars and Huns into the N.E. of Germany, and the neighbouring countries. Procopius calls them *Spori*, and divides them into the *Sclavi* and *Antes*, the latter, perhaps, the same as the Wends. They formed, at an early period, two principal states, Great Russia, about Novogorod, and Little Russia, on the Dnieper, its capital being Kiev. The Russi were a Scandinavian branch, under Rurik, to whom the Slavonians of the former state submitted in 862, whence they were called Russians; and Rurik's successor, Oleg, conquered Kiev. After several vicissitudes, the Russians were liberated by Iwan Wasiliewitch, at the end of the fifteenth century; and this period was the beginning of their greatness. Their language has some mixture of Greek, Finnish, Swedish, Tartarian, and Mongol. The ecclesiastical dialect was uniformly retained in all literary works in the former part of the last century, but now the language of conversation is generally adopted in writing. This language is more immediately derived from that of Great Russia: that of the church, which is called the *Slawenish*, rather from Little Russia, and especially from the dialect of Servia. The *Malo-Russian* dialect is somewhat mixed with the Polish, and is spoken in Ukraine and Little Russia; the *Susdalian* is mixed with Greek and other languages, and is spoken in Thrace.

In 640, the Slavonians took possession of Illyria, which before that time had been overrun by a variety of other nations; and they still retain it, under the names of Servians, Croatians, and Southern Wends. The *Servians* are supposed to have come from Great Servia, now East Gallicia, on the Upper Vistula; the *Croatians*, from Great Chrobatia, probably situated on the Carpathian Mountains. Cyril first adapted the Greek alphabet to the Slavonian language in Pannonia; his letters were afterwards a little altered, and attributed to St Jerome, in order to reconcile the people to their use; and in this form they are termed *Glagolitic* characters. The Servian dialect is intermediate between the Russian and the Croatian. The Bulgarians speak a corrupt Slavonian, which Boscovich, from *Ragusa*, could scarcely understand. The *Uskoks* are a wild race of the Bulgarians, extending into Carniola, and speaking a mixed language. The dialect of Slavonia and Dalmatia is nearly the same as that of Servia and Bosnia; the churches use the ecclesiastical language of Russia. In *Ragusa*, the orthography approaches, in some measure, to the Italian. The Servian is also imperfectly spoken by a small colony in Transylvania. The Southern *Wends* were first distinguished in 630, and were probably so named, like the *Veneti*, from being settled on the shores of the Adriatic, the word *Wend* or *Wand* meaning Sea. They are now mixed with Germans in Carniola, Carinthia, and Lower Stiria. In Hungary there is a small colony, who call themselves *Slowens*, and speak the *Wendish* dialect of the Slavonian. The western Slavonians, or the proper *Sclavi*, write their language in the Roman characters; but the specimens copied from Adelung are accommodated in their orthography to the German mode of pronunciation.

The *Poles* probably came with the Russians from the Danube into the countries abandoned by the Goths; the name *Pole* implies an inhabitant of plains. Their language was partly superseded by the Latin in the tenth century, when they received the rites of the Latin church; but it has in later times been more cultivated. The *Cassubians*, or *Kashubians*, in Pomerania, speak a Polish mixed with a little German. In Silesia, the names of places in the plains are Slavonian; in the hills, more lately occupied, German; but German has been the language of Breslau ever since the year 1300.

The *Bohemians* emigrated with the Moravians and *Slowaks* into their present habitations about the middle of the sixth century, after the destruction of the kingdom of Thuringia by the Franks and Saxons. There is a Bohemian hymn of the date 990, and a chronicle in rhyme of 1310. One-third of the Bohemians are of German origin, and speak a corrupt German.

The *Serbs* or Wends came about the same time into the countries between the Saal and the Oder, from the neighbourhood of the Volga or the Crimea; a few of them are still left in *Lusatia*, under the name of Wends or Slavonians, and some in Misnia. In Pomerania the *Wendish* became extinct about 1400; but the *Polubes* in Lüneburg, on the *Layne* kept up till lately a language consisting of a mixture of *Wendish*

language. and German. The *Sorabic* of the Russian vocabulary seems to be the same with this Servian.

Of the *Lithuanian* or *Lettish* language, two-thirds are Slavonian, the rest is principally German. When the Goths had removed from the Baltic towards the Black Sea, their neighbours the *Æstii* remained for some hundred years independent, till, in the sixth century, the Slavonians incorporated themselves with them, and formed the Lettish people and language. The *Old Prussian* was spoken, at the time of the Reformation, in Samland and its neighbourhood, but it is now lost; it contained more German than the other Lithuanian dialects. The *Prussian Lithuanian* is spoken from the Inster to Memel, especially in Insterburg. The *Polish Lithuanian*, in Samogitia, has a little mixture of Polish. The proper *Lettish* is current in Lettland and Courland; it is purest about Mittau and Riga; the old Courlanders having been Fins, this dialect has received a little Finnish from them. The *Crivingsian* is another dialect, spoken by the Krewins in Courland.

[*Sarmatian* is a convenient term for the Slavonic and Lithuanic collectively. The Sanscrit, instead of being a language of the Indo-European class, with equal affinities to the Greek, Latin, German, and Sarmatian, has a special preponderance of Sarmatian affinities.—A. G. L.]

17. The Tshudish or Finnish, the Hungarian, and the Albanian languages, have some traits of resemblance to each other: they are placed as forming the *sporadic* or scattered order of the great *Tataric* or Asiatic class, being in some measure geographically detached from the rest, and scattered through different parts of Europe: they immediately follow the Indo-European class, as exhibiting an occasional resemblance to some of the languages contained in it, though not enough to make it certain that the connection is essential or original. Thus the Finnish is said to have some coincidences with the Greek, the Laplandish with the Hebrew, the Hungarian with the Finnish, and the Albanian with all its neighbours.

The term *Tshudish* is employed as comprehending the Fins, Laplanders, Esthonians, and Livonians; a race of people of unknown origin, but in all probability unconnected with the Huns or Mongols. Their languages are remarkable for the great complexity of their structure; their nouns, for example, having from ten to fifteen cases, among which are reckoned, in the Finnish, a nuncupative, a conditional accusative, a factitive, a mediative, a descriptive, a penetrative, a locative, a privative, and a negative. The Esthonian has less direct variety of terminations, but several intricate combinations. There is also a great multiplicity of dialects, partly from a mixture of Scandinavian, and partly from other causes; in Lapland almost every church has a peculiar version of the service kept for its use. The *Finnish* is intermediate between the *Laplandish* and the *Esthonian*. The Esthonians are the *Æstii* of the Romans, the name implying Easterly, and being appropriate to the country, and not to the people. The principal dialects of their language are those of Reval and of Dorpat; some authors also consider the dialect of the Krewins in Courland as belonging to it. The *Livonian* is much mixed with other languages, and has been almost superseded by the Lettish. Amongst the Laplandish words which Rudbeck has derived from the Hebrew, we find *Aedhame*, Earth, like the Hebrew *Adameh*. *Hadas*, New; Heb. *Khadesh*. *Hadshe*, the Moon; Heb. *Khadesh*. *Jed*, the Hand; Heb. *Id*. *Ise*, Man; Heb. *Ish*. *Pothi*, Persuaded; Heb. *Pathehh*. *Saedke*, Law; Heb. *Tzedek*: and *Safothi*, Rested; Heb. *Sabbath*. In the Finnish, *Kana* is something like the English and German *Hen*.

18. The *Hungarians* inhabited, in the fourth century, the country of the Bashkirs, between the Tobol, the Volga, and the Jaik, perhaps as colonists, since their name signifies strangers. Their language was spoken in this neighbourhood as late as the thirteenth century; in the sixth they were conquered by some of their Turkish neighbours; in the end of the ninth they were forced by the Petschenegs, a Tartarian nation, to remove nearer to the Carpathian Mountains. They were then engaged in the German wars, and their country having been occupied during their absence by the Bulgarians, they took possession of the Bulgarian kingdom on the Theiss, as well as of Pannonia. Their language is somewhat like the Finnish, but the people are very different from the Fins in appearance; which might indeed be the effect of a difference of climate; but, in fact, the language appears to be still more

like the Slavonian with a mixture of a multitude of others; Language. it has some words from various Tartarian dialects, German, French, Latin, Armenian, Hebrew, Persian, and Arabic; but it has no traces of the Mongol, nor is it possible that the people can be descendants of the Huns, whose character and cast of features can never be eradicated. The word *Coach*, so general in Europe, is originally Hungarian, having been derived from the town of *Kots*, where coaches are said to have been invented. The Szecklers, in Transylvania, speak a language like the Hungarian; it is uncertain whether they are a Hungarian colony, or remains of the Petschenegs; but, however this may be, there is little doubt that the Hungarians are principally of Tartarian extraction, though much mixed with other nations.

19. The *Albanians* speak a language, of which a considerable portion is Greek, Latin, German, Slavonian, or Turkish; but the rest seems to be perfectly distinct from any other language with which we are acquainted. They are probably connected with the Albanians between Mount Caucasus and the River Cyrus, who are supposed to be derived from the Alani; some of them seem to have entered Bulgaria as late as 1308. In 1461 many of them fled from the Turks to *Italy* and *Sicily*, where they still exist near Reggio and Messina. The Clementines are an Albanian colony, who followed the Austrian army in 1737; such of them as escaped from the pursuit of the Turks established themselves in Syrmia.

[The Albanian is less, the Hungarian more, Finn than the text makes them.

The ordinary term at present in use for the name of the class is *Ugrian*.

It is chiefly in the southern part of the area that the Ugrian languages are sporadic. The Hungarian has intruded into Hungary; the Russian into the governments of Permian, Viatka, Kazan, Simbirsk, and Saratov, &c., all of which were originally Ugrian. The Lap, Esthonian, Finn of Finland, &c., are all continuous.

The so-called Indo-European tongue nearest to the Finn is the Lithuanic.

The Livonians (*Liven*) are a small population of *Courland*, originally spread over *Livonia*, or *Liefland*, to which they gave the name.

The locality of the *Æstii* was the amber-country of East Prussia, not Esthonia.—A. G. L.]

20. The languages referred to the *Caucasian* order have little to distinguish them from the rest of the class, except their geographical situation, in the immediate neighbourhood of the Caucasian Mountains. They have a general resemblance to some others of the languages of Northern Asia, and particularly to the Samojedic dialects, spoken on the mountains between Siberia and the Mongols. Except the Armenian and Georgian, they are scarcely ever employed in writing; and principally, perhaps, from this cause, they exhibit as great a diversity, in the space of a few square miles, as those of many other nations do in as many thousands. It is only conjectured that most of the inhabitants of these countries are derived from the miscellaneous fragments of expeditions of various nations, left behind in their passage through them at different periods.

[The use of the term Caucasian in ethnological physiology (the *Caucasian* race of Blumenbach, containing Arabs, Jews, Europeans, &c.) as a class-name for a heterogeneous group of families, engenders ambiguities. The present writer has suggested the name *Dioscurian*; *Dioscurias* being the name of a town of Caucasus, not only mentioned by ancient writers, but mentioned with reference to the remarkable multiplicity of languages and dialects spoken in its neighbourhood—this being a notable characteristic of modern Caucasus.

The *Dioscurian* class he arranges as follows:—

1. Circassian or Tsherkess, falling into the Abassian, Tsherkess, and Kabardinian divisions.
2. The Lesgian, falling into—
 - a. The Tshetsh (Kistic)—the Tshetshents, Ingush, and Tushi; and
 - b. The Lesgian Proper—the Avar, Dido, &c.
3. The Georgian—Suanic, Imiretian, Mingrelian, Lazic, and Kartulinian dialects.
4. The Armenian—ancient and modern.
5. The Iron, or Osset, leading to the Persian, and containing numerous Indo-European words.

Language. The nearest affinities of the most northern and most characteristic of the Caucasian dialects, the Circassian, are with the Tibetan, and the western monosyllabic tongues. It is only because the comparison has been most carefully made with the Samoyed, that they seem to be more akin to that family than to others. They have miscellaneous affinities with all the Turanean languages. There is no reason to believe that any of them are other than aboriginal to the soil.—R. G. L.]

The connection of the *Armenian* with the Sanscrit and the Persian is just enough to make it equally possible that the coincidences may have been derived from a common parent, or that one language may have simply borrowed detached words from the other. We find, in different parts of Mr Townsend's work, about ten Armenian words resembling some other language; these are—*Air*, a Man; Irish *Air*. *Atamn*, a Tooth; Greek *Odonta*. *Chuerk*, Four; Sanscrit *Chatur*. *Dor*, a Door. *E*, Is; Latin *Est*. *Es*, I; Russian *Iaze*. *Gas*, a Goose; German *Gans*. *Houze*, a House. *Lakeil*, to Lick; Greek *Leichein*; and *Sirt*, the Heart. Nothing is known of the history of the Armenian before the time of Miesrob, who translated the Bible into it in 405: the historian Moses, of Chorene, was his pupil. The language flourished till the year 800, and is still preserved in tolerable purity in the cloisters. The common people speak a dialect more corrupt and mixed. The fathers of the Armenian convent at Venice have been very laudably employed in the improvement of the literature of their nation by the publication of several very elegant editions of Armenian books, which have been executed at their press; in particular, of an Armenian translation of Eusebius, containing some passages which are not extant in Greek, and said to have been copied from a manuscript of great antiquity at Constantinople. It is, however, very remarkable, that, as they candidly confess, the copy, when first received by them, contained the corrections and additions of Scaliger, in conformity with the text of the printed Greek edition; and the copyist, when questioned, asserted that he had merely translated, and inserted passages of his own accord, and in silence, in order to make the work more perfect. Still the Armenian Eusebius is a very handsome book, and every way calculated to do credit to the Venetian editors and their patrons; a Latin translation of it only has been published by Angelo Mai at Milan.

[The persons of the verb, and the numerals are the points in which the Armenian most agrees with the so-called Indo-European languages; but these are just the points in which numerous languages, never considered Indo-European, also agree. The glossarial affinities are most with the Iron (Osset), and Persian. It graduates through these into the other allied groups. Nevertheless, many authorities make it absolutely Indo-European.—R. G. L.]

21. The *Georgians* are supposed to have derived their name from the River Cyrus or Gur, and to have extended formerly to Colchis, under the denomination of Iberians. Moses of Chorene, in the fifth century, mentions the Georgian translation of the Bible. The old language is still preserved in the churches, and the common dialect of the country is derived from it, together with the *Kartvelish*, *Imirettish*, *Mingrelish*, and *Suanetish*, which are varieties of that dialect; the *Tushetish* is mixed with some Kistic. The Georgians have no fewer than thirty-seven letters, and among them a variety of aspirates and sibilants, of no very agreeable sounds.

[To the Georgian dialects of the text, add the *Lazic* of the Mohammedans of the parts between Batoum, Kars, and Trebizond. Subtract the *Tushi* (*Tushetish*) which is *Tshetsh*. The *Kartulinian* is the most cultivated, the *Suanic* the rudest, of the Georgian forms of speech.—R. G. L.]

22. The *Abassic* nations seem to be the oldest inhabitants of the Caucasian country. 23. The *Circassians* are situate to the E. of them, on the promontory of North Caucasus. 24. The *Ossetes*, on the left of the Terek, N. of the mountain; the dialect of the *Dugors* is scarcely distinguishable from this. 25. The *Kistric*, spoken by the *Ingushans*, and their neighbours at the head of the Terek, is connected with the *Tushetic* Georgian. 26. The *Lesgiens*, E. of Caucasus, on the Caspian Sea, have a number of distinct dialects, or rather languages. Thus, the *Chunsag* and *Avaric*, the *Dido*, the *Kasi Kumik*, the *Andi*, and the *Akushan*, have little connection with each other, except that the *Dido* somewhat resembles the *Chunsag*, of which the *Avaric*, the *Anteug*, and the *Dzhar*, seem to be

subordinate dialects. The *Kasi Kumik* appears to have adopted some words of the Armenian, and the *Andi* and *Akushan* of the Georgian. The dialect of *Kubesha* resembles that of *Akusha*, and retains no traces of a supposed European origin.

[The *Abassic* is Circassian; the Circassian forms of speech being the most monosyllabic and uninflected of Caucasus—also most like the Tibetan.

The *Osset* (or *Iron*) is the most like the Persian, and has by many been considered Indo-European. But the Georgian is connected with it. What do we infer from this? That the Georgian also is Indo-European, or that the *Osset* is not so? The former is the inference of learned men with whom the present writer (who holds the latter view) reluctantly differs.—R. G. L.]

27. The languages of the central and elevated parts of Asia are comprehended in the order *Tartarian*; they extend from the Caspian Sea to the mouth of the Amur, through countries which have been in former ages the constant scenes of emigration and barbarism. The *Turco-Tartarians* are supposed to correspond to the descendants of the Magog of the Scriptures, and to some of the Scythians of the Greeks. The Turks of Turkestan seem to have been the Massagetæ and Chorasmi of the ancients; their country extended N. of Persia and Thibet, from the Caspian to the Altaic Mountains. In the twelfth century they were brilliant and victorious; at present, a few of their descendants only are left in the neighbourhood of the Mongols, and their language is no longer spoken; the Turcomans scattered in Persia and Arabia are derived from the same race. The Osmans, now commonly called Turks, left Turkestan in 545, and succeeded in the conquest of Persia. They were denominated Osmans, from one of their leaders, in the fourteenth century. Their language has been much mixed with Arabic and Persian. This language, with the neighbouring dialects, has been considered in the table as belonging to a family called *Caspian*, the word *Tartarian* having been previously applied to the whole order. Several of these dialects exhibit a mixture of words from the language of the Mongols, which, as well as the Calmuck, has a sufficient connection with them to be arranged as belonging to the same Turco-Tartarian family. It would, perhaps, be equally correct to consider some of them rather as distinct languages than as dialects of a single one; but it is not easy to discriminate those which are entitled to this rank; and, on the other hand, some specimens have been admitted, from the Comparative Vocabularies, which scarcely deserved to be noticed as separate dialects. The *Bucharians* are situate between the Oxus and Jaxartes, on the River Koly. They still retain some traces of a superior degree of civilization, by which they were once distinguished. Their language is little known, but it seems to be at least as much connected with the Median and Arabian families as with the Caspian. The Tartars were described by the terms *Scythians*, *Bulgarians*, *Avari*, and other appellations, before they were conquered and united by Genghiz Khan the Mongol. In the year 1552 they became subject to the Russians. The most westerly are the *Nogaic* or *Nagaic* and *Crimean Tartars*; their language is much like the Turkish, but mixed with some Mongol. Those of *Cumania* in Hungary have now forgotten their original language, and speak the Hungarian, the last person who understood the Cumanian having died in 1770. They entered Hungary in 1086, and became Christians in 1410. The *Tartarian*, or rather *Caspian*, is spoken in great purity about *Kasan*; a dialect somewhat different in *Orenburg*; and another by the *Kirghishes*, who occupy part of the ancient Turkestan. "Among the Siberian Tartars, the remains of the kingdom of Turan, some are Mohammedans; others, as the *Turalin* villagers, have been made Christians; at least the Archbishop Philophei performed the ceremony of baptizing them, by ordering his dragoons to drive them in a body into the river." The inhabitants of the banks of the *Tara*, a branch of the Irish, are said to be derived from the *Bucharians*. The *Tshulimic* Tartars enjoy the same advantage as the *Turalin*, and are considered as Christians by the Russians. The *Teloutan*, in Sonjor, are heathens, nearly like the *Shamanites* of India. The *Jakuts* extend along the *Lena* to the sea; their language contains some *Mantshuric* and some *Tungusic*. That of the *Tshuwashes*, on the *Volga*, is said to have been once completely distinct from the *Tartarian* or *Caspian*; and even at present,

Language. though more mixed with it, may require to be classed as forming a separate species.

The *Mongols* are marked by their features as a race very different from the other Tartars; the character of their countenance seems to be easily propagated from father to son, and never to be completely effaced; their original habitation appears to have been in the neighbourhood of the Altaic Mountains. The description of the Huns, found in Ammianus, Procopius, and others, agrees exactly with the present Mongols, whom the Chinese still call *K'iong nu*; and more particularly with the Calmucks. The proper names of the Huns are also found to be explicable from the Mongol language. In the first century they were driven westwards by the Chinese: under Attila they penetrated into the middle of Europe; and they were little less successful at subsequent periods, under Genghiz Khan and Timur Leng. When they were expelled from China, after having held it in subjection for more than a century, they carried back no civilization with them; nor was either of the languages permanently affected by this temporary mixture of the nations, although the physiognomy of the Chinese bears ample testimony of its having once existed. The construction of their language seems to be very indirect and figurative. Mr Townsend has copied from General Vallancy a long list of words, in Strahlenberg's *Mongol Vocabulary*, which agree very remarkably with the Irish; among these we find *Are* and *Ere*, man; Irish *Ar*, *Air*, Fear. *Arul*, a spindle; Irish *Oirle*. *Alemamodo*, an apple-tree; Irish *Amhalmhaide*. *Asoc*, to ask; Irish *Ascadh*. *Baiehu*, I live long; Irish *Baoth*, long life. *Bugu*, a buck; Irish *Boc*, a he-goat. *Choy*, a ewe; Irish *Choi*; and *Choraga*, a lamb; Irish *Caorag*; without going any further in the alphabet. The last two instances are very striking, and seem to point very strongly at that part of the East from which the Celts may be supposed to have originally emigrated. The *Calmuck* dialect is somewhat mixed with the neighbouring Tartarian. The Tagurians, or Daurians, between the Lake Baikal and the Mongol Hills, are said to be of Mantshuric origin; but their language evidently resembles the Calmuck. The *Burattish* is from the Russian vocabularies.

28. The *Mantshurians* are sometimes improperly called Eastern Mongols; they are subjects of the empire of China. Their language is rude, and not much like the Chinese, though evidently derived from the monosyllabic class. It has some few words in common with the European languages, as *Kiri*, patient; *Kirre*, German; *Cicour*, Latin, tame. *Furu*, *Furor*. *Lapta*, rags; *Lappen*, German. *Sengui*, blood, *Sanguis*; *Ania*, a year, *Annus*; but, considering the remoteness of their situation, we can scarcely form any conclusion from the occurrence of these resemblances. M. Abel Rémusat held the appointment of professor of this language at Paris; but it was found difficult for him to render its study very popular in the midst of so busy a metropolis. Whether the language of the island of *Sagalien*, opposite to the mouth of the Amur, is a dialect of the Mantshuric, or totally distinct, and requiring to be classed with the insular languages, appears to be not yet sufficiently ascertained. The *Corean* has been supposed to be a mixture of Mantshuric and Chinese: the Coreans do not understand either of those languages when they are spoken, but this fact is perfectly compatible with the supposition.

29. The *Tungusians*, in the E. of Siberia, subject to the Chinese, speak a peculiar language, mixed with some Mongol. The Russian vocabularies contain specimens of a variety of their dialects, besides those of the Tshapogirs, on the Jenisei; and the Lamuti, on the Sea of Ochotsk, none of them particularly interesting or remarkable.

[The Bucharian Proper is Persian; the Uzbek of the dominant stock only being Turk.

The Tshuwash is as often considered Ugrian as Turk.

The Huns are quite (if not more) likely to have been Turks than Mongolians.

The present classification of the languages allied to the Turk is as follows:—

The *Turanian*, or *Scythic* stock contains the (1.) Mongolian, (2.) Turk (Tartarian), (3.) Tungus, and (4.) Ugrian branches.

The Manchu is a section of the Tungus branch. The Corean belongs to a different division.—R. G. L.]

30. The languages belonging to the *Siberian* order occupy the principal part of the N. of Asia, between the mountainous Tartarian territory and the Frozen Sea. At the commence-

ment of this order, we find a variety of inconsiderable nations Language. in the neighbourhood of the confines of Europe and Asia, which have their distinct languages, probably formed, in times comparatively modern, out of the fragments of others. They have almost all of them some Finnish words, but none a sufficient number to justify us in considering them as dialects of the Finnish language, although the people were very probably connected with the Fins as neighbours, in the middle ages, on the banks of the Dwina and elsewhere. The *Sirjanes*, in the government of Archangel, speak nearly the same language with the *Permians*, who are partly in the same government, and partly in that of Kasan. The *Wotiaks*, on the Wiatka, also in Kasan, have a dialect which seems to be intermediate between the Permian and the Tsheremissic. 31. The *Woguls*, situate on the Kama and the Irtish, afford specimens of several dialects in the Russian collection; they seem to have borrowed a few words from the Hungarian, and much more from the language of the *Ostiaks* (32), who are also divided into several races. 33. The *Tsheremisses*, situate on the Volga, in Kasan, have a little mixture of Turco-Tartarian. 34. The *Morduins*, on the Oka and Volga, have about one-eighth of their language Finnish, and also some Turco-Tartarian words. The *Mantshuric* is a dialect differing but slightly from the Morduin. 35. The *Teptjerai* are people paying no taxes, who originated from the relics of the Tartaro-Kasanic kingdom in the sixteenth century, and who are said to speak a language peculiar to themselves. The arrangement of all these dialects must remain very imperfect, for want of a greater number of specimens of their peculiarities.

36. The *Samojedic* nations are situate N. of the Tartars, by whom they may possibly have been driven into their present habitations. Their languages seem to have some affinity with the Caucasian and Lesgian dialects, and some of them with the Wogulic and Ostiak families; the specimens in the Comparative Vocabularies seem to have been multiplied somewhat too liberally. 37. The *Camashes* are situate on the right of the Jenisei; they are Shamanites or Buddhists; their language seems to be a mixture of several others, and is divided into several very distinct dialects. The *Koibals* have been baptized; they have borrowed some words from the Turco-Tartarian family. The *Motors* are situate on the Tuba. 38. The *Ostiaks* on the River Jenisei afford us five specimens of languages totally different from those of the *Ostiaks* already mentioned, but nearly connected with each other, so that they may properly be called *Jenisei-Ostiaks*. 39. The *Jukagirs*, or *Jukadshirs*, are few in number; they are situate between the Jakuti and the Tshutshi; they have some Jakutish words mixed with their language, and some Tsheremissic.

[The Teptyar are Turk rather than Ugrian.

All the other populations of this section are Finn or Ugrian, viz., Sirianian, Permian, Morduin, Samoyed, &c. The term Siberian is not used in the sense of the text.—R. G. L.]

40. The *Koriaks* and the *Tshutshi* occupy the north-eastern-most point of Siberia; the proper Koriak is spoken on the Bay of Penshin; the *Kolymic* on the River Kolyma, the *Tigilic* on the Tigil, in Kamtschatka; and the *Karaginic* on the island Karaga: the Tshutshic has been considered as a dialect of the Koriak. 41. The *Kamtschatkans* are a little farther S.; the *Tigilic Kamtschatkan* is found, however, on the N. of the Tigil; the *Srednish* to the W., on the Bolshaia, and the *Jashnyshic* on the River Kamtschatka, and towards the South Cape. The languages of the neighbouring parts of America, according to Professor Vater, greatly resemble the Tshutshic.

The *Insular* order of the Tataric or Atactic class of languages must be understood as comprehending all the Asiatic islands E. of Borneo. 42. The language of the *Curilees* is spoken not only in the principal of these islands, but also in Kamtschatka, about Cape Lopatka; but in some of the islands the Japanese is spoken. The *Japanese* derive themselves from the Chinese, but their language contradicts this opinion; they have evident traces of Mongol extraction or relationship. The amiable islanders of *Loochoo* will long be remembered by the British public, for the hospitality they showed to the Alceste and the Lyra; their language appears to be related to the Japanese, as might be expected from their situation.

[In the opinion of the present writer, the Koriak (to which the Kamskadale belongs), the Curile, the Japanese, and the Corean, constitute a class, for which he recommends the name

Language. *Peninsular*, transitional to the Ugrian tongues on the one hand, and the American on the other.—R. G. L.]

Formosa was conquered by the Dutch in 1620, but in 1661 it was taken from them by a Chinese pirate: the next year some books were printed in the Formosan language in Holland, the recapture of the island not being yet known there; in 1682, it was finally given up to the Chinese government. 47. The *Moluccan* is considered by Dr Leyden as an original language; that of Magindanao contains some Malayan, Moluccan, Tagalish, and Bugis. The *Tagalish*, or *Gala*, is the principal language of the *Philippines*, and almost as generally understood in that neighbourhood as the Malay and Hindustanee in other parts; it is allied to the Malayan and to the Javanese, and was probably derived in great measure from these languages; it also resembles in some measure the Bugis. The *Bissayish* is a ruder dialect of the Tagalish. The *Sulu* differs but little from these dialects, being derived from the same sources. The *Bugis* is the language of Celebes; it is supposed to be more ancient than the Javanese; it seems to contain no Sanscrit, but much Malay, Tagalish, and Javanese, and some of the old Ternate, or Moluccan; it is written in a peculiar character, and some good poetry is found in it. There is a dialect called the *Mungharar*. The *Bima* somewhat resembles this dialect; it is spoken in the eastern parts of Sumbawa, and the western of Endé or Flores; it is written either in the Bugis or the Malay character; it seems to have a distant resemblance to the language of Orissa. The dialect of *Sumbawa* exhibits some slight variations. A few single words, as *Matta*, the eye, and *Matte*, death, are found to coincide in almost all the islands of the *Pacific Ocean*; the languages of which, notwithstanding their immense distances, seem to differ less than those of the inhabitants of some very small continental tracts; and they might probably be divided into a few well-defined families, if our knowledge of them were more complete. The resemblance of *Matta* to the Arabian *Mot*, and the Latin *Mactare*, is probably accidental.

[All these languages are Malay.—R. G. L.]

The number of the *AFRICAN* languages is supposed to amount to one hundred or one hundred and fifty, and as many as seventy or eighty of them have been distinguished with tolerable accuracy. The population of Africa seems to have been derived from Arabia, and, as some critics think, rather from the southern than from the northern part; a great number of its present inhabitants are negroes, but these cannot be distinguished from the rest by any infallible criterion. The account given by Ptolemy of the interior part of the country appears to be wonderfully accurate and extensive; although some of his measures seem to be erroneous, and not sufficiently reconcilable with the truth, even by adopting Major Rennell's hypothesis respecting them. It is, however, remarkable that Ptolemy followed Hipparchus in extending the eastern coast of Africa to the Ganges, although more correct ideas of its form had been entertained at Alexandria before his time.

The *Egyptians* demand the priority in treating of the inhabitants of Africa, from their early connection with ancient history, both sacred and profane. It is observable that the representations of the old Egyptians have countenances more or less approaching to the negro physiognomy, though the dry bones of the skeleton have that character somewhat less decidedly than they must have had when clothed with the thick lips and flattish noses of the generality of the representations; at the same time there are sculptures of great antiquity, which exhibit features not unlike those of correct Grecian or Roman beauty; and others have a considerable resemblance to the Arabian nation. At present the people of middle Africa in general are more or less like negroes, but they are somewhat less dark, and their noses and lips are less peculiar; the women sometimes screamed if Burckhardt made his appearance on a sudden, and called him the devil, because he was white. The Egyptians are supposed by some writers to have received their civilization from Ethiopia; but there are at present no traces of the remains of high civilization farther S. than Nubia, except a few scattered monuments about Axum, of no great antiquity. The Egyptians were at first called Copts by the Saracens, and their language has been commonly distinguished by the appellation *Coptic*, that is, as written in characters which are principally Greek, and frequently intermixed with a number of pure Greek words; but not a single frag-

ment of Coptic has yet been discovered in this form that is Language. earlier than the establishment of Christianity in Egypt; and it seems probable that the character was introduced by the early Christians at the time of the translation of the Scriptures into Coptic, which is certainly of very high antiquity. The Greek authors frequently mention an Egyptian alphabet of twenty-five letters; but no traces of any such alphabet are found in the multitudinous inscriptions or manuscripts that have been preserved by the exertions of the numerous and adventurous travellers who have lately visited the country. The Greek words mixed with the Coptic are not considered by the grammarians as incorporated with the language, nor are they admitted into the dictionaries. The genuine language bears very evident marks of great antiquity; its construction is simple, and often awkward, and a great number of its words are monosyllables. We have positive evidence of its having remained unaltered from the time of Herodotus, Plutarch, and other Greek authors; and it affords us the etymology of the name of Moses, and of some other words mentioned in the Scriptures. It exhibits a few coincidences with other ancient languages, but not enough to enable us to consider it either as the offspring or the parent of any of them, except that it gives us something like an explanation of the meaning of some of the Greek particles. Out of one hundred and fourteen original Egyptian words, there are fifty-two that resemble the Greek, twenty-seven the German and English, eighteen the Hebrew, three the Syriac, two the Arabic, two the Sanscrit, one the Slavonian, and one the Cantabrian. It is, however, probable, that a person more intimately acquainted with the languages of the Arabian family would have been able to find a much greater number of coincidences, since nations which had so much intercourse as the Jews and the Egyptians could scarcely fail to have many words in common, even if their languages had been at first completely different; and probably many of the Arabic roots, which are not Hebrew, may be found in the Egyptian. To the Cantabrian word inserted in this enumeration Dr Young added five others, the whole six being—*Berria*, new; *Ora*, a dog; *Guchí*, little; *Oguia*, bread; “*Otsoa*,” a wolf—whence the Spanish *Onza*; and *Shashpi*, seven. In Coptic, *Beri*, new; *Uhor*, a dog; *Kudshi*, little; *Oik*, bread; *Uonsh*, a wolf; and *Shashf*, seven. Hence he infers, that “if we consider these words as sufficiently identical to admit of our calculating upon them, the chances will be more than a thousand to one that, at some very remote period, an Egyptian colony established itself in Spain; for none of the languages of the neighbouring nations retain any traces of having been the medium through which these words have been conveyed. On the other hand,” he continues, “if we adopted the opinions of a late learned antiquary, General Vallancy, the probability would be still incomparably greater that Ireland was originally peopled from the same mother country, since he has collected more than one hundred words which are certainly Egyptian, and which he considers as bearing the same sense in Irish; but the relation, which he has magnified into identity, appears in general to be that of a very faint resemblance; and this is precisely an instance of a case in which it would be deceiving ourselves to attempt to reduce the matter to a calculation.” It may, indeed, be imagined that the Egyptian dominions may formerly have extended to the Straits of Gibraltar, and that Spain may have derived a part of its population from this part of Africa, which approaches so near to it; but it could scarcely have happened that no traces of Egyptian monuments should ever have been found at any distance from the Nile, if that active people had really occupied any considerable portion of the neighbouring continent. The word *Chemistry*, in Greek *Chemía*, is well known to be derived from the Egyptian; it has successively been compared, by the Quarterly Reviewer, to *Chim* or *Chem*, heat, and to *Chem*, secret; the latter being the more probable origin of the two; and a third etymon might be found, if it were required, in the *Dshem*, or *Ghem*, to find, or invention. The Coptic language has been nearly extinct for about two centuries; but the service has been read in Coptic much more lately in some of the churches, though it has now been almost entirely superseded by the Arabic. The proper Coptic, or Memphitic, which was the dialect of Lower Egypt, is supposed, from a word quoted by Herodotus, to be the most ancient; the Sahidic or Thebaic of Upper Egypt was probably

Language. preserved for a longer time, especially in some of the monasteries; there is a separate version of the principal part of the *Bible* in this dialect, fragments of which have been published by Mingarelli and Woide; a third dialect, much resembling the Thebaic, is commonly called the Bashmuric; and a fourth, the Oasitic, has been partially made known by M. Quatremère de Quincy. The Egyptians have left no traces of their language among the people who at present occupy the countries that they inhabited; the Nubian vocabularies collected by Burckhardt contain no Coptic words; the people are of different Arab races, but have acquired peculiar dialects, probably mixed with those of the neighbouring negro nations, of several of which we find specimens in Mr Salt's *Voyage to Abyssinia*. [The Coptic is an eminently agglutinate language.

As far as the hieroglyphics have been deciphered, the language given by even the earliest is Coptic.

Syllable for syllable, *Copt* = *E-gypt*.

The *Barabra* is a Nubian dialect.

The nearest affinities of the Coptic are those that geography suggests, viz., the Semitic, and the other Sub-Semitic forms of speech.—*R. G. L.*]

But one of the most learned, as well as the most adventurous and industrious, of modern travellers, has remarked some coincidences between the old Egyptian language and that of the *Barabras*, who are neighbours of the Nubians, and extend to the confluence of the Tacazze and the Nile. The Geez and Amharic have already been mentioned as descendants of the Arabian family; they seem to have introduced some traces of this extraction into several of the neighbouring dialects, probably by the translations of the Scriptures, or by the use of the Koran. Professor Vater has taken some pains to prove that the language of Amhara, the Camara of Agatharchides, is wholly independent of the Ethiopic and Arabian; but in this he appears to be mistaken. It exhibits some slight resemblance to the Sanscrit, in a few instances; thus *Tshegure* is hair, in Sanscrit *Sshicoura*. Macrizi tells us that there are, in the whole, fifty Abyssinian dialects; but he has probably exaggerated their number. We have obtained more authentic information respecting them from the collections of Bruce, and of his editor, Murray, and still more lately from Dr Seetzen and Mr Salt. Of the Mek of Dongola, the representative of a long race of the Christian kings of Nubia, little is now known, except that he is in a great measure dependent on the king of Sennaar on the one hand, and has been expelled from a part of his territories by the Mamelukes on the other. Of the Agows and the Gafats, neighbours of the Abyssinians, and situate on the Bahr el Azrek, as well as the Jewish Falashas, who are scattered over the country, especially in Dembea, we have read much in the historical romances of Mr Bruce, which certainly give a faithful picture of the countries to which they relate, notwithstanding some unaccountable inaccuracies with respect to the personal adventures of the author.

The N. of Africa is occupied by inhabitants not much differing in appearance from the Arabs. Its three principal divisions are—the coast, the country of wild beasts, and the desert. The later Arabs have expelled the earlier Africans from the first division, and partly from the second; the Berbers occupy the third, inhabiting principally the *oases*, or cultivable islands, scattered through the desert from Mount Atlas to Egypt, and speaking, as Horneman first ascertained, the same language throughout its vast extent. They were first well described by Leo Africanus: they are probably the remains of the Mauritians, Numidians, Gætulians, and Garamatians. There is no foundation whatever for the opinion of some modern authors of celebrity, that their language is derived from the Punic. We even find, from Sallust, that the Numidian language differed from the Carthaginian; and from Valerius Maximus, that it was written in a peculiar character, perhaps the same with that which is found in the inscriptions from Lebeda, now in the court of the British Museum. The language of the *Canaries* considerably resembles the Berber; thus, milk is *Acho* in Berber, and *Aho* in the *Canaries*. These islands were discovered in 1330, and afterwards conquered, with some difficulty, by the Spaniards. The inhabitants were a fine race of men, and lived in comfort and tranquillity: and they still present some traces of their original character and condition.

[The Gafat are Semitic; the Agows and Falasha Sub-Semitic. So are the Berber, or Amazingh tongues.

The Dongola forms of speech are Nubian. *Barabra* (dif-ferent from *Berber*) and Nubian are nearly synonymous — *R. G. L.*]

The country between the desert Zahara and the Niger is inhabited by a race of people who have a great resemblance to negroes, but are somewhat different from them. In the E. are those of *Soudan* or *Afmu*, and *Begermah*; in the W. the *Foulahs*; the *Fellatas* are a branch of these, extending considerably to the N.E., with a mixture of negroes.

Of the languages of the negroes, strictly so called, many interesting specimens have been collected by the zeal of the evangelical missionaries in the Caribbee Islands, and published by Oldendorp, in his *Account of the Mission*; but they do not afford us sufficient materials to enable us to trace any extensive connections or dependencies among their multifarious dialects.

There are some points of coincidence between the language of *Madagascar* and those of the Malays, the Philippine islanders, the *Beetjuana* Caffres, and the *Corana* Hottentots: there are also a few words, in many of the African dialects, borrowed from the modern Arabic, not, as Court de Gebelin would persuade us, from the Phœnician. Nor can any other of the affinities be very distinctly established.

The *Caffres* have little of the negro character except the black colour, and less of this as they become more remote from the equator. They are supposed to extend across the whole of Africa, immediately N. of the Hottentots, as far as Benguela and Quiloa. The *Hottentots*, with their neighbours the *Bosjemen*, speak different dialects of the same singular language, in different parts of their country. Of that of the *Dammaras*, little or nothing is known. Lichtenstein has classed them as Hottentots; but Barrow, who was better acquainted with them, considers them as Caffres.

[For a fuller sketch of the African languages in general, see below; here observing that—

a. The Malagasi of Madagascar is Malay.

b. There are two different populations known as *Dammaras*, one of which is Caffre, one Hottentot.—*R. G. L.*]

ADDENDA.

On the Languages of Armenia.

The *ESKIMO*.—The extent to which this language is isolate has been greatly exaggerated. It has decided and direct affinities with the north-eastern Ugrian and the Peninsular languages on one side, and the north-western languages of America on the other.

It is spoken in Greenland, Labrador, the coast of the Arctic Ocean, Russian America, the Aleutian Isles, and the parts about Tshuktsh-Noss in Asia.

It is succeeded by the languages of,—

The *ATHABASKAN GROUP*.—The vast size of the area over which the Athabaskan tongues have spread themselves has commanded less attention than it deserves. It should command attention if it were only for the fact of its touching both the oceans—the Atlantic on the one side, the Pacific on the other.

For the northern Athabaskans, the main body of the family, the philological details were, until lately, eminently scanty and insufficient. There was, indeed, an imperfect substitute for them in the statements of several highly trustworthy authors as to certain tribes who spoke a language allied to the Chepewyan, and as to others who did not,—statements which, on the whole, have been shown to be correct; statements, however, which required the confirmation of vocabularies. These have now been procured; if not to the full extent of all the details of the family, to an extent quite sufficient for the purposes of the philologue. They show that the most western branch of the stock, the Chepewyan proper, or the language of the Northern Indians, was closely akin to that of the Dog-ribs, the Hare (or Slave), and the Beaver Indians, and that the Dahodinni, called from their warlike habits the *Mauvais Monde*, were but slightly separated from them. Farther W. a change took place, but not one of much importance. The interpreters were understood with greater difficulty, but still understood.

The Sikani and Sussee tongues are known by specimens of

Language.

considerable length and value, and these languages, lying as far S. as the drainage of the Saskatchewan, and as far W. as the Rocky Mountains, are, and have been for some years, also known as Athabaskan.

Then came the Takulli of New Caledonia. This was the Nagail, or Chin Indian of Mackenzie, or nearly so. Now, *Nagail* I hold to be the same word as *Tacull-i*, whilst *Chin* is *Tshin* = *Dinne* = *Tnai* = *Atna* = *Knai* = *Man*. The Takulli division falls into no less than eleven (?) minor sections, all of which but one end in this root, viz., *tin*.

1. The Tau-*tin*, or Talko-*tin*.
- (?) 2. The Tsilko-*tin*, or Chilko-*tin*, perhaps the same word in a different dialect.
3. The Nasko-*tin*.
4. The Thetlio-*tin*.
5. The Tsatsno-*tin*.
6. The Nulaau-*tin*.
7. The Ntaau-*tin*.
8. The Natliau-*tin*.
9. The Nikozliau-*tin*.
10. The Tatshiau-*tin*, and
11. The Babin Indians.

Sir John Richardson, from vocabularies procured by him during his last expedition, the value of which is greatly enhanced by his ethnological chapter on the characteristics of the population which supplied them, has shown, what was before but suspected, that the Loucheux Indians of Mackenzie River are Athabaskan, a most important addition to our knowledge. Now, the Loucheux are a tribe known under many names,—under that of the Quarrellers, under that of the Squinters, under that of the Thycothe, and Digothi. Sir John Richardson calls them Kutshin, a name which we shall find in several compounds, just as we found the root *tin* in the several sections of the Takulli, and as we shall find its modified form *dinni* among the eastern Athabaskans. The particular tribes of the Kutshin division occupant of either the eastern frontier of Russian America, or the north-western parts of the Hudson's Bay territory, are (according to the same authority) as follows:—

1. The Artez-*kutshi* = Hard people.
2. The Tshu-*kutshi* = Water people.
3. The Tatzei-*kutshi* = Rampart people; falling into four bands.
4. The Teytse-*kutshi* = People of the shelter.
5. The Vanta-*kutshi* = People of the lakes.
6. The Neyetse-*kutshi* = People of the open country.
7. The Tlagga-silla = Little dogs.

This brings us to the *Kenay*. Word for word, *Kenay* is *Knai* = *Tnai*, a modified form of the now familiar root *t-n* = *man*, a root which has yet to appear and reappear under various new, and sometimes unfamiliar and unexpected forms. A *Kenay* vocabulary has long been known. It appears in Lisiansky tabulated with Kadiak, Sitkan, and Unalaskan of the Aleutian Islands. It was supplied by the occupants of Cook's Inlet. Were these Athabaskan? The present writer owes to Mr Isbister the suggestion that they were Loucheux, and to the same authority he was indebted for the use of a very short Loucheux vocabulary. Having compared this with Lisiansky's, he placed both languages in the same category—rightly in respect to the main point, wrongly in respect to a subordinate. He determined the place of the *Loucheux* (*Kutshin*, as he would now call them) by that of the *Kenay*, and made both Kolush. He would now reverse the process, and make both Athabaskan, as Sir John Richardson has also suggested.

The *Atna*, at the mouth of the Copper River, the *Koltshani*, higher up the stream, and the *Ugalents*, about Mount St Elias, are all held by the present writer to be Athabaskan; not, indeed, so decidedly as the Beaver Indians, the Dog-ribs, or the proper Chepewyans, but still Athabaskan.

The most southern of the Athabaskans are the Sussees, in N. latitude 51°; there or thereabouts. But the Sussees, far S. as they lie, are only the most southern of the Athabaskans *en masse*. There are outliers of the stock as far S. as the southern parts of Oregon. More than this, there are Athabaskans in California, New Mexico, and Sonora.

Few discoveries respecting the distribution of languages are more interesting than one made by Mr Hale, to the effect that the Umkwa, Kwaliokwa, and Tlatskanai dialects of a district so far S. as the mouth of the River Colum-

bia, and the upper portion of the Umkwa River (further S. still), were outlying members of the Athabaskan stock—a stock pre-eminently northern, not to say arctic, in its main area.

Yet the dialects just named were shown, by a subsequent discovery of Professor Turner's, to be only penultimate ramifications of their stock, inasmuch as further S., and further S. still, in California, New Mexico, Sonora, and even Chihuhua, as far S. as 30° N. latitude, Athabaskan forms of speech were to be found; the Navaho of Utah and New Mexico, the Jecorilla of New Mexico, and the Apatch of New Mexico, California, and Sonora, being Athabaskan. The Hoopah of California is also Athabaskan.

The KOLUSH of Sitka, &c., can be made Athabaskan by raising the value of the class, or it can stand as the sample of a separate and allied group.

The first of the populations to the S. of the Athabaskan area, who, lying on or to the W. of the Rocky Mountains, are other than Algonkin, are,—

THE KITUNAH.—The Kitunaha, Kutani, Cootanie, or Flatbow area is long rather than broad, and it follows the line of the Rocky Mountains between 52° and 48° N. latitude.

The Kutani, differs notably from the tongues with which it is in geographical contact; though, like all the languages of America, it has numerous miscellaneous affinities.

THE ATNA GROUP.—W. of the Kutanis, and S. of the Takulli Athabaskans, lie the northernmost members of a great family, which extends as far S. as the Sahaptin frontier, the Sahaptin being a family of Southern, or American Oregon.

The *Atna*, called by Mr Hale, Tshihali-Selish languages, reach the sea in the parts to the S. of the mouth of Fraser's River, i.e., the parts opposite Vancouver's Island; perhaps they touch it further to the N. also; perhaps, too, some of the Takulli forms of the speech further N. still reach the sea. The current statements, however, are to the effect that to the S. of the parts opposite Sitka, and to the N. of the parts opposite Vancouver's Island, the two families in question are separated from the Pacific by a narrow strip of separate languages—separate and but imperfectly known. These are, beginning from the N.,—

THE HAIDAH GROUP OF LANGUAGES, spoken by the Skittagats, Massetts, Kumshahas, and Kyganic of Queen Charlotte's Islands and the Prince of Wales Archipelago. Its area lies immediately to that of the S. of the so-called Kolush languages.

THE CHEMMESYAN, spoken along the sea-coast and islands of N. latitude 55°.

THE BILLECHULA, spoken at the mouth of Salmon River; a language to which I have shown elsewhere that a vocabulary, from *Mackenzie's Travels*, of the dialect spoken at Friendly Village, was referable.

THE HAILTSA.—The Hailtsa contains the dialects of the sea-coast between Hawkesbury Island and Broughton's Archipelago; also those of the northern part of Vancouver's Island.

In Gallatin, the Chemmesyan, Billechula, and Hailtsa are all thrown in a group, called *Naas*. The Billechula numerals are certainly the same as the Hailtsa; the remainder of the vocabulary being unlike, though not altogether destitute of coincidences. The Chemmesyan is more outlying still. I do not, however, in thus separating these three languages, absolutely deny the validity of the *Naas* family. I only imagine that if it really contain languages so different as the Chemmesyan and Hailtsa, it may also contain the Haidah and other groups; e.g., the ones that come next, or

THE WAKASH of Quadra and Vancouver's Island.

THE TSHINUK, or Chinuk.

THE KALAPUYA.

THE JAKON; all agreeing in the harshness of their phonesis, and (so doing) contrasted with—

THE SAHAPTIN, and

THE SHOSHONI.

The Sahaptin is separated by Gallatin from the Wailatpu, containing the Cayús or Molelé form of speech. The present writer throws them both into the same group.

The Shoshoni and Sahaptin languages are as remarkable for the apparent ease and simplicity of their phonesis as the Jakon, Kalapuya, and Tshinuk are for the opposite qualities.

Language. South of the Cavús, Wailatpu, and Wihinast, or Western Shoshonis, come—

(a.) The LUTUAMI; (b.) the PALAIK; (c.) the SHASTI, thrown by Gallatin into three separate classes. They are, without doubt, mutually unintelligible. Nevertheless, they cannot be very widely separated.

The Lutuami seems somewhat the most Sahaptin of the three, and this is what we expect from its geographical position, it being continuous with the Molelé (or Cayús) and the allied Wailatpu. It is also continuous with the Wihinast, Shoshoni, or Paduca, as is the Palaik. Both Palaik and Lutuami (along with the Shasti) have Shoshoni affinities.

Of three languages spoken in the N. of California, and mentioned in Schoolcraft by name, though not given in specimens—(1), the Watsahewa; (2), the Howteteah; and (3), the Nabitse, the first of which is said to be that of the Shasti bands.

Of the Howteteah I can say nothing.

The Nabitse is probably the language of the Tototune; at least, Rogue's River is its locality, and the Rascall Indians is an English name for the Tototune.

South of the Shasti and Lutuami areas we find—

1. The EHNİK.
2. The TAHELEWAH.

The junction of the Rivers Klamath and Trinity gives us the locality for—

The LANGUAGES AKIN TO THE WEITSPEK.—The Weitspek itself is spoken at the junction, but its dialects of the Weyot and Wishosk extend far into Humboldt county, where they are probably the prevailing forms of speech, being used on the Mad River, and the parts about Cape Mendocino.

The Weyot and Wishosk are mere dialects of the same language. From the Weitspek they differ much more than they do from each other. It is in the names of the parts of the body where the chief resemblances lie.

The MENDOCINO (?) GROUP.—This is the name suggested for the *Choweshak*, *Batendaikai*, *Kulanapo*, *Yukai*, and *Khwaklamayu* forms of speech collectively.

1, 2. The Choweshak and Batendaikai are spoken on Eel River, and in the direction of the southern branches of the Weitspek group, with which they have affinities.

3, 4, 5. The *Kulanapo* is spoken about Clear Lake, the *Yukai* on Russian River. These forms of speech, closely allied to each other, are also allied to the *Khwaklamayu*.

We may now turn to the drainage of the Sacramento and the parts S. of the Shasti area. Here we shall find three vocabularies, of which the chief is called—

The COPEK.—How far this will eventually turn out to be a convenient name for the group (or how far the group itself will be real) is uncertain. A vocabulary in Gallatin from the Upper Sacramento, and one from Mag Readings (in the S. of Shasti county), belong to the group.

The PUJUNI.—Concerning this we have a notice in Hale to the effect that, about 80 or 100 miles from its mouth, the River Sacramento formed a division between two languages, one using *momí*, the other *kik* = water.

The Pujuni, &c., say *momí*, as did the speakers of the Chepo.

For this group we have—(a.) Pujuni, (b.) Secumne, and (c.) Tsamak specimens, as also the Cushna vocabulary, from the country Yuba, the Cushna numerals, as well as other words, being nearly the same as the Secumne.

The MOQUELUMNE GROUP.—The name *Moquelumne* is proposed, inasmuch as we find a Moquelumne Hill (in Calaveras county), and a Moquelumne River within the area over which the languages belonging to it are spoken. Again, the names of the tribes that speak them end largely in *mne*, *Chupumne*, &c. As far S. as Tuolumne county the language belongs to this division.

These make a provisional division for a vocabulary called—

The COSTANO.—The tribes under the supervision of the Mission of Dolores were five in number—the Ahwastes, the Olhone, or Costanos of the coast, the Altahmos, the Tulomos, and the Romonans.

The MARIPOSA LANGUAGES.—In the N. of Mariposa county, and not far S. of the Tuolumne area, the language seems changed, and the *Coconoos* is spoken by some bands on the Mercede River, under a chief named Nuella. They are said to be the remnants of three distinct bands, each with its own distinct language.

The SALINAS GROUP.—This is a name which I propose for a group of considerable compass, and one which contains more than one mutually unintelligible form of speech. It is taken from the River Salinas, the drainage of which lies in the counties of Monterey and San Luis Obispo.

The Ruslen, Eslen, San Antonio, and San Miguel of this group are probably four mutually unintelligible languages.

The Salinas languages are succeeded to the S. by the forms of speech of—

The SANTA BARBARA GROUP, containing the Santa Barbara, Santa Inez, and San Luis Obispo languages.

The CAPISTRANO GROUP.—Capistrano is a name suggested by that of the Mission of San Juan Capistrano. The group, I think, falls into two divisions—

1. *The Proper Capistrano*, or *Netela*, of San Luis Rey and San Juan Capistrano.
2. *The San Gabriel*, or *Kij*, of San Gabriel and San Fernando.

The YUMA LANGUAGES.—At the junction of the Gila and Colorado stands Fort Yuma, in the district of the Yuma Indians. They occupy each side of the Colorado, both above and below its junction with the Gila. How far they extend northwards is unknown, probably more than 100 miles. They are also called *Cuchans*, and are a fierce predatory nation, encroaching equally on tribes of their own language and on aliens.

From these Yuma Indians I take the name for the group now under notice. It contains, besides the Yuma Proper, the Dieguno of San Diego, the Coco-maricopa, and the Cochimi (succeeded by the Waikur and Perien) of Old California.

The Coco-maricopa Indians are joint occupants of certain villages on the Gila, the population with which they are associated being *Pima*. Alike in other respects, the Pima and Coco-maricopa Indians differ in language.

That the Pima group contains the Pima Proper, the Oyata, and the Eudeve, may be seen from the Mithridates. That the language of the Papagos, or Papago-cotam, is also Pima, rests upon good external evidence. Whether the speech of the Ciris, and population of the island of Tiburon and the parts opposite, be also Pima is at present uncertain.

W. of the Pima lies the Tarahumara, and S. of it the Hiaqui, succeeded by the Tubar and Cora of Sinaloa.

The Paternosters of these four languages, compared with the Oyata dialect of the Pima, suggest the likelihood of a closer relationship than is usually admitted.

With these end our *data*, but not our lists of dialects. The names Maya, Guazave, Heria, Sicuraba, Xixime, Topia, Tepeguana, and Acaxee, all being either in Hervas, or elsewhere, as applied to the different forms of speech of Sonora and Sinaloa, to which may be added the Tahu, the Pacasca, and the Acasca, which is probably the same word as Acaxee, as Huima is the same as Yuma, and Zaque as Hiaqui. Of the Guazave a particular dialect is named as the Ahome. Add also the Zoe and Huitcole, probably the same as the Huite.

That some of these unrepresented forms of speech belong to the same class with the Pima, Hiaqui, &c., is nearly certain. How many, however, do so is another question; it may be that *all* are in the same predicament, it may be only a few.

The languages of Mechoacan are—

1. The PIRINDA.
2. The TARASCA.
3. The OTOMI.

More has been written on the Otomi than any other language of these parts, the proper Mexican not excepted. It was observed by Naxera that it was *monosyllabic* rather than *polysynthetic*, as so many of the American languages are, with somewhat doubtful propriety, denominated. A Mexican language, with a Chinese characteristic, could scarcely fail to suggest comparisons. Hence the first operation on the Otomi was to disconnect it from the languages of the new, and to connect it with those of the old world. With his accustomed caution, Gallatin satisfies himself with stating what others have said, his own opinion evidently being that the relation to the Chinese was one of analogy rather than affinity.

Doubtless this is the sounder view, and one confirmed by three series of comparisons made by the present writer.

The first shows that the Otomi, as compared with the mo-

Language. nosyllabic languages of Asia *en masse*, has several words in common. But the second qualifies our inferences by showing that the Maya, a language more distant from China than the Otomi, and by no means inordinately monosyllabic in its structure, has, there or thereabouts, as many. The third forbids any separation of the Otomi from the other languages of America, by showing that it has the ordinary amount of miscellaneous affinities.

In respect to the Chinese, &c., the real question is, not whether it has *so many affinities with the Otomi*, but whether it has *more affinities with the Otomi than with the Maya or any other American language*,—a matter which we must not investigate without remembering that *some* difference in favour of the Otomi is to be expected, inasmuch as two languages with short or monosyllabic words will, from the very fact of the shortness and simplicity of their constituent elements, have more words alike than two polysyllabic forms of speech.

The fact, however, which most affects the place of the Otomi language is the monosyllabic character of other American languages; *e.g.*, the Athabaskan and the Attakapa.

UTAH AND NEW MEXICO.—The comparative civilization of the Pueblo Indians of New Mexico has always attracted the attention of the ethnologist. Until lately, however, he had but a *minimum* amount of trustworthy information concerning either their habits or their language. He has now a fair amount of *data* for both. For philological purposes he has vocabularies for six (probably for all) of them.

Of the Pueblo languages two belong to the drainage of the Rio Colorado, and four to that of the Rio Grande. Of these two divisions the former lies the farthest W., and of the two Colorado Pueblos, the most western is that of—

The *Moqui*.—The Moqui vocabulary was procured by Lieut. Simpson from a Moqui Indian who happened to be at Chelly.

The *Zuni* country lies in 35° N. latitude, to the S. and E. of the Moqui, and is probably divided by the Sierra de Zuni from—

The *Acoma*, or *Laguna*, the most southern of the Pueblos of the Rio Grande. N. of the Acoma area lies that of—

The *Jemez*, on the San Josef.

The two that still stand over lie on the main stream of the Rio Grande itself. They are—

The *Tesuque*; and

The *Taos* or *Picuri*.—The northern boundaries of the Tesuque seem to be the southern ones of Taos. Connect these *Pueblos* with the town of Taos, and the Tesuque with Santa Fé, and the ordinary maps give us the geography.

The philological affinities of the Pueblo languages scarcely coincide with the geographical relations. The Moqui lies far W. Laying this then out of the question, the three that most strike the eye in tables, as agreeing with each other, are the Laguna, the Jemez, and the Tesuque. The other two that thus outwardly agree are the Taos and the Zuni,—two that are not in the most immediate geographical juxtaposition.

The Moqui, which is not to be separated from the other Pueblo languages, has, out of twenty-one words compared, eight coinciding with the Utah.

Neither are there wanting words common to the Pueblo languages and those of the Athabaskan Navahos, Jecorillas and Apaches.

It is convenient, in a notice of the languages of the state of TEXAS, to bear in mind its early, as well as its present, relations to the United States. In a country where the spread of the population from the other portions of the Union has been so rapid, and where the occupancy is so complete, we are prepared to expect but a small proportion of aborigines. And such, upon the whole, is the case. The displacement of the Indian tribes of Texas has been great. Even, however, when Mexican, Texas was not in the category of the older and more original portions of Mexico. It was not brought under the *régime* of the missionaries, as we may see by turning to that portion of the Mithridates which treats of the parts W. of the Mississippi. The references here are to Dupratz, to Lewis and Clarke, to Charlevoix, to French and English writers, rather than to the great authority for the other parts of Spanish America—Hervas. And the information is less precise and complete. All this is because Texas, in the earlier part of its history, was, in respect to its exploration and description, a

part of Louisiana (and, as such, French) rather than a part of Language. Mexico (and as such, Spanish).

The notices of Texas, in the Mithridates, taken along with our subsequent *data*, are to the effect that (*a.*) the *Caddo*, (*b.*) the *Adaize* or *Adahi*, (*c.*) the *Attakapa*, and (*d.*) the *Choktah*, are the prevailing languages of Texas; to which may be added a few others of minor importance.

The details as to the distribution of the subordinate forms of speech over these four leading languages are as follows:—

(*a.*) The Nandakoes, Nabadaches, Alich (or Eyish), and Ini, or Tachi, are expressly stated to be *Caddo*; and, as it is from the name of the last of these that the word Texas is derived, we have satisfactory evidence that *some* members, at least, of the Caddo family are *truly and originally* Texian.

(*b.*) The Yatassi, Natchitoches, *Adaize* (or *Adaye*), Nacogdoches, and Keyes, belong to the Caddo confederacy, but without speaking the Caddo language.

(*c.*) The Carancouas, the *Attacapas*, the Apelusas, and the Mayes, speak dialects of the same language.

(*d.*) The Tunicas speak the same language as the Choktahs.

Concerning the philology of the Washas, the Bedies, the Acoosesaws, and the Cances no statements are made.

It is obvious that the information supplied by the Mithridates is measured by the extent of our knowledge of the four languages to which it refers.

Of these, the Choktah, which Adelung calls the Mobilian, is the only one for which the Mithridates itself supplies, or could supply, specimens; the other three being unrepresented by any sample whatever. Hence, to say that the Tachi was Caddo, that the Yatassi was Adahi, or that the Carancoua was Attacapa, was to give an instance, in the way of explanation, of the *obscurum per obscurius*. Since the publication of the Mithridates, however, we have got samples of all three—Caddo, Adahi, and Attacapa.

The tendency of the Mithridates is to give prominence to the Caddo, Attakapa, and Adahi tongues, and to incline the investigator, when dealing with the other forms of speech, to ask how far they are connected with one of these three. The tendency of the later writers is to give prominence to the Cumanch, and to suggest the question: How far is this (or that) form of speech Cumanch, or other than Cumanch?

A *Washita* vocabulary, which will be referred to in the sequel, concludes the list of Texian languages known by specimens.

At present, the chief question respecting the philology of Texas is one of distribution. Given, as centres to certain groups—

1. The Choktah,
2. The Caddo,
3. The Adahi,
4. The Attakapa,
5. The Cumanch, and
6. The Washita languages—

how do we arrange the tribes just enumerated? Two works help us here,—1. *A Letter from the Ex-President Burnett to Schoolcraft on the Indians of Texas*; date 1847. 2. *A Statistical Notice of the same by Jesse Stem*; date 1851.

Stem's statistics run thus:—

TRIBES.	NUMBERS.	TRIBES.	NUMBERS.
Towacarros.....	141	Caddos.....	161
Wacos.....	114	Andarcos.....	202
Ketchies.....	38	Ioni.....	113
Tonkaways.....	1,152	Lipans.....	500
Wichitas.....	100	Cumanches.....	20,000

giving us several of the names that have already appeared; giving also great prominence to the Cumanches—numerically at least.

In Mr Burnett's *Letter* the term *Caddo* is prominent; but whether it denote the Caddo language, or merely the Caddo confederation, is uncertain. Neither can I find from the context whether the statements respecting the Indians of the Caddo connection (for this is what we must call it at present), are made on the personal authority of the writer, or whether they are taken, either directly or indirectly, from the Mithridates. The term that Burnett uses is *stock*, his statement being that the Waco, the Tawacani, the Towiah, the Aynic, the San Pedro Indians, the Nabaducho, and the Nacodochets, are all both Texian in origin and Caddo in stock.

His other tribes are—

Language. 1. The *Ketchi*, a small tribe on Trinity River, hated by the Cumanches as sorcerers, and, perhaps, the same as—

2. The *Hitchi*, once a distinct tribe, now assimilated with their neighbours.

3. The *Tonkaways*, a separate tribe, of which, however, the distinctive characters are not stated.

Whatever may be the exact details of the languages, dialects, and subdialects of Texas, the general outline is simple.

The *Choctah* forms of speech are anything but native. They are of foreign origin and recent introduction. So are certain Sioux and other dialects spoken within the Texian area.

The *Cumanch* is in the same predicament; though not, perhaps, so decidedly. It belongs to the Paduca class, and its affinities are with the Shoshoni and Wihinast of Oregon.

The *Caddo* Proper is said to be intrusive, having been introduced so late as 1819 from the parts between the great Raft and the Natchitoches, or Red River. I hold, however, that some *Caddo* forms of speech must be indigenous.

The *Witchita* is probably one of these.

The *Adahi* has already been noticed as being a comparatively isolated language, but, nevertheless, a language with numerous miscellaneous affinities.

The *Attacapa* is one of the pauro-syllabic languages of America, by which I mean languages that, if not monosyllabic after the fashion of the languages of south-eastern Asia, have the appearance of being so. They form a remarkable class, but it is doubtful whether they form a natural one; *i.e.*, whether they are more closely connected with each other in the other elements of philological affinity than they are with the tongues not so characterized. They deserve, however, what cannot be given in the present paper, a special consideration.

For the north-eastern districts of Mexico, New Leon, Tamaulipas, &c., *i.e.*, for the parts between the Rio Grande and Tampico, no language is known to us by specimens. It is only known that the *Cumanch* dips deeply into Mexico. So does the *Apatsh*.

A tribe, lately mentioned, that of the Lipans, is, *perhaps*, *Apatsh*. Burnett states that they agree with the Mescalero and Seratics of the parts about the Paso del Norte. For these, however, we still want vocabularies *is nominibus*.

For the parts about Tampico the language belongs to the Huasteca branch of—

The *MAYA*.—The *Maya* succeeds the languages just enumerated on the east. On the west, the *Otomi*, *Pirinda*, and *Tarasca* are succeeded by—

The *MEXICAN PROPER*.

The languages that, from their comparative obscurity, claim the attention of the investigator, are those which are *other than Maya*, and *other than Mexican Proper*.

Of these, the first succeeds the Huasteca of Huastecapan, or the parts about Tampico; which it separates, or helps to separate, from the northern branches of the *Maya Proper*, being—

The *Totonaca* of Vera Cruz.

Cross the watershed from Vera Paz to Oaxaca, and you come to the area of—

The *MIXTECA*.—In the ordinary maps, Tepezcolula, on the boundaries of Oaxaca and Puebla, is the locality for its chief dialect, of which there are several.

The *Mixteca* is the language of Northern Oaxaca.

The *ZAPOTECA* that of Southern Oaxaca.

South of the areas of the three languages just enumerated comes the main division of the *Maya*—the *Maya* of Guatemala and Yucatan, as opposed to the Huasteca of the parts about Tampico. This, however, we pass over *sicco pede*, for—

The *LENCA* dialects of Honduras, San Salvador, &c.; these being from the four Pueblos of Guajiquiro, Opatoro, Intibucá, and Sirmilton, those of the last being shorter and less complete than the others. They are quite recent, and are to be found only in the Spanish edition of Mr Squier's Notes on Central America. The English is without them.

As Mr Squier is the sole authority for the *Lenca* of San Salvador and Honduras, so he is for *Nicaragua*, for which we have specimens of—

1. The *CHORETEGA*;

2. The *NAGRANDA*; and

3. The *WULWA*, of the Chontal district.

The language of the Mosquito country gives us a fourth form

of speech; at least (I think) as different from the *Choretega*, *Language*, *Nagranda*, *Wulwa*, and *Lenca*, as they are from each other. This is—

The *WAIKNA* of the Indians of the coast, and, probably, of several allied tribes inland.

In Costa Rica, a *Talamanca*; in Veragua, a *Bayano*, a *Savanenc*, and a *Cholo* vocabulary carry us into South America, which must not, however, be entered before the languages of North America, to the E. of the Rocky Mountains, have been noticed.

S. of the Eskimo, and S. and E. of the Athabaskan group, come the great class of the languages called—

ALGONKIN, falling into the following (more or less) provisional divisions:—

1. The *Bethuck* of Newfoundland;

2. The *Central Group*, containing the Cree, Skoffi, Micmay, Echemin, Abnaki, Algonkin Proper, Ojibwa, Delaware, Pequod, Mohican, Narraganset, Natick, Massachusetts, Messisauigi, Pamticough, Menomini, Sauk, Potowotami, &c.;

3. The *Shyenne and Arapaho*;

4. The *Blackfoot*.

The vast area of this class extends from Labrador to North Carolina. It surrounds that of the—

IROQUOIS—the Mohawk, Oneida, Onondago, Seneca, Cayuga, Huron, Nottoway, and Tuscarora, &c.

The *SIoux*.—Winnebago, Dakota (with divisions and subdivisions), Assineboin, Upsaroka (Crow), Mandan, Minetari, Osage. The *Sioux* area lies chiefly between the Mississippi and the Rocky Mountains.

The *Woccon* (with which associate the *Catawba*) of Carolina.

The *CHEROKEE* of Tennessee, &c.

The *CHOCTAH*, *MUSKOGHE*, and *CREEK* of Florida, &c.

The *Caddo* (see notice of Texas) have all *Sioux* and *Iroquois* affinities; as have also—

The *RICCAREE* and *PAWNEE* of Kansas and Nebraska.

In Alabama, Mississippi, and Louisiana.

The *NATCHEZ*, *UCHE*, and *CHELOMACHA*, have miscellaneous affinities, but still have to be definitely fixed.

They are succeeded by the *Adahi* and *Attacapa*, already noticed.

In South America we begin with a very obscure area. In the *Mithridates* there is no specimen of any sufficient length of any of the languages of New Grenada, of which the chief was called the *Muyska*. Neither, until lately, did the present writer know of any vocabularies. He wrongly imagined that all the Indian forms of speech were extinct, and has erroneously stated as much in his work on the *Varieties of Man*. This opinion he now corrects. The *Bibliotheca Glottica* of Ludwig gives the following data. For (see *sub. voc.*)—

The *Andaqui* of the territory of Mocoa, a vocabulary taken in 1854 by the Presbyter Manuel Marca Albis.

Notices of some words of the *Coconucos*, *Polindaras*, and *Guambras*, in the province of Cundinamarca.

Vocabulary of the *Correguaje*, spoken in the territory of Mocoa.

Do. of the *Guaque*, *ibid.*

Do. of *Inganos*, *ibid.*

The *Muyska Proper*, or *Chibcha*, nearly extinct, is spoken in the neighbourhood of Santa Fè de Bogota. The chief dictionary of it is in MSS. (See Ludwig, *ad voc. MUYSKA*).

To the south the languages of New Grenada are succeeded by—

The *QUICHUA* of Bolivia and Peru, the language of the Incas, spoken from the equator to S. Lat. 28. The *Quichua* area almost surrounds that of—

The *AYMARA* of the parts about the Lake Titicaca, to which it is allied.

The *Quichua* is spoken as far inland as Tucuman; but over a great portion of its area it is an intrusive and foreign language, a fact which leads us to the consideration of the minor, and less known language, within its area, or on its precincts. These, though probably numerous, are little known by specimens. There is one of the *ZAPARA* language of the province of Mainas, which looks like an independent form of speech. There is also the—

YURAKARES of the eastern slope of the Andes, in 17° S. Lat.

In Venezuela and Demerara, the great—

Language. CARIB family takes the same prominence as the Quichua in Peru. To it belong the Chayma, Tamanak, Arawak, Accawa, Macusi, Arecuna, Maionkong, Guinai, Soerikong, Wayawara, Maopetyan, Tiverighotto, Pianoghotto, and most of the numerous languages whose names end in *ghotto*.

Akin to the Carib are several of the languages of the Orinoco, Rio Negro, and northern bank of the Amazons, of which we know by specimens the—

SALIVA, MAYPURE, YABURA, and OTTOMACA groups, of undetermined value.

With Carib and Maypure affinities, in proportions hitherto unascertained, we find on the northern affluents of the Amazons, the Uainambu, Tariana, Isanna, Barre, and Tomo-Maroa forms of speech; and somewhat more isolated (though with miscellaneous affinities), the Juri, the Javita, the Coretu, Cobeu, and Tucano, known from vocabularies in Mr Wallace's work on the Amazon and Rio Negro.

In a similar state of isolation, as compared with the definite and undoubted members of the Carib family (though still with miscellaneous affinities), are the Warow, Taruma, and Wapishana of Demerara.

In Brazil there is the great family of the GUARANI tongues, and, by the side of it, the analogues of the minor languages of the Inca and Carib districts. Thus, of the Brazilian languages

OTHER THAN GUARANI we know, by specimens, the Botocudo, Coropo, Coroado, Puri, Machacali, Malali, Camacan, Menieng, Cachriaba, Kiriri, Sabujah, Timbira, and others. Of—

THE GUARANI, the Guarani Proper (the basis of the Lingua Geral, Lingua Franca), the Chiriguano, the Omagua, the Mundrucu. The Omagua is spoken on the Napo, the Chiriguano on the La Plata; so wide is the vast Guarani area. (See *Ethnology*.)

Passing over large tracts of *terra incognita*, in the Missions of Moxos and Chiquitos, the Moxa, Movima, Cayuvaya, Sarabeca, Covareca, Pacaguara, Curuminaca, and Paicoconca forms of speech, known by specimens, with miscellaneous affinities, and leading to the languages of the Chaco, which form a class of considerable compass called—

ABIPONIAN — Abiponian Proper, Mbocobi, Toba, Payagua (?) Lengua, and Zamucu (?). The exact relations of these to the Lule is uncertain. We approach, however, another group.

THE CHILENO-PATAGONIAN—The Araucarian (Chileno Proper), the Pampa (?), the Patagonian, and the Fuegian.

A recent and valuable contribution to the philological ethnography of America, by Mr Daa of Christiania, besides giving a comparison of the Samoyed of Asia with the Dakota of America (along with much other subsidiary matter), contains more than one suggestion respecting the forces by which changes in language are effected. Great stress is laid upon the size of the community that uses it. "When language is confined to the daily use of a family, or a small knot of acquaintance, it stands in a quite contrary relation to the use of men, than when it is the common medium that combines millions of human beings. In the last case, the individual license in changing the adopted sounds and significations of words, whereby are introduced novelties of speech, is continually checked by the impossibility of making all such unnecessary changes comprehensible to the mass of those who speak. Thus we see that in the present English and French languages, this license of adding to what is the common property of millions in both hemispheres, is a privilege for only a few distinguished inventors of new things, or authors of widely-read books. The power of changing language is so much repressed, that it can only be observed by comparing two remote periods of the history of the language, as you observe the geological changes by considering generations as merely a single day. The habit of speaking distinctly is then kept up and cultivated as a necessary means to be comprehended by the many unknown persons you continually meet with.

"In a small island in the South Sea, or an insignificant tribe in the wildernesses of America or Siberia, the facility of changing language may easily be conceived to be next to unbounded. Everybody who speaks must become understood, because his hearers almost know beforehand what he is to say. The most arbitrary changes of languages are thus introduced continually, as may be proved historically.

"Almost all those languages that are spoken by nations living either in a natural (geographical) isolation, or in an arbitrary and artificial one, want a great number of letters. For one letter in one dialect is substituted another letter in the next tribe; because every word is as well understood whether you pronounce it with the letter *r*, or *l*, or *v*. Accidental and individual defects of uttering are thus changed into national peculiarities, and a general indistinctness of pronunciation is introduced. The sounds that are hardly perceptible to a stranger will, among close relatives, appear sufficiently intelligible.

"The strange practices of mutilating the nose and the lips must have contributed a great deal to disfigure the enunciation of language itself. The insertion of one or more large pieces of wood into incisions in the lips or the nose, still practised on the Pacific coast, and from which custom a tribe is called *Naz Percé*, has no doubt been more frequent formerly. These mutilations would evidently make it next to impossible to pronounce any labial consonant, and they would in return introduce a nasal articulation. Now a paucity of labial, and a superfluity of nasal sounds, is just what we observe in many American languages.

"Similar permutations of letters of course happen among all languages of the world, and in fact form the basis and the principal means by which the differences in language are introduced and produced. Only among those nations who lead an isolated life are these changes more violent, and appear to separate tribes that evidently, from their general habits and manners, must be very closely related. Thus the Dakotas, forming only a nation of 25,000 individuals, are split into tribes divided by such considerable differences of dialect as these—one tribe changes *d* into *t*, and *h* into *r*; another changes *h* into *k*; a third changes *h* into *g*; *d* is altogether rejected, and *l* substituted in its place; another band only uses *g* at the end of syllables, and *l* does not occur; thus, the word *hda*, 'to go home,' becomes *kda* and *gla* in different dialects.

"In the syllabic alphabet invented for the Cherokee tongue by a native, the whole number of possible syllables is merely seventy, besides the vowels. In the excellent Dakota Dictionary of Mr Riggs we see abundant proofs how a scarcity of radical words and simple ideas is made to expand into a language of endless compositions. But, from the variety of objects to be expressed, these composed words in a great measure must contain the most arbitrary descriptions of things: a continual make-shift of substitutes for the thing that is thus obscurely brought before the mind. For instance, the word *maza* means 'metal of any kind,' *gadi* 'merchandise;' hence are derived, by addition of other substantives, or adjectives and particles, compositions expressing an *anchor*, *iron pot*, *bracelet*, *bell*, *trap*, *chair*, *gun* and all its parts, *pistol*, *cannon*, *lock*, *ramrod*, &c., *nail*, *steelyard*, *blacksmith*, *spade*, *fingerring*, *stove*, *skates*, *sword*, *iron*, *silver*, *money*, *dollar*, *shilling*, *bank-note*, *medal*, *gold*, *lead*, *bullet*, *moulds*, *copper*, *pewter*, *button*, *spoon*, *pan*, *brass*, *file*, *hammer*, *pincers*, *tongs*. In like manner the syllable *ta* comprehends all ruminating animals and their parts.

"The state of small isolated tribes or clans in which the half-savage nations live will as easily introduce an endless change of significations. In a family, or amongst the inmates of the same house, it is quite as easy to make arbitrary expressions or slang words understood and ultimately accepted of as an indistinct utterance of the common words. Instead of *father*, you may say *master*, *governor*, *husband*, *the old one*, and the original word *father* you may restrict to *God* only; instead of *child* you may use any word signifying *little* or *dear*, &c. We have special accounts of two remarkable instances of the action of this principle among the rude tribes. One is the superstitious custom of the South Sea islanders, on the death of a king whose name is composed of a couple of common words, to abstain altogether from the use of those words that form his name, and to substitute others. The practice is either ascribed to a reverence for him, or to some religious sentiment connected with omens. Such a custom will, of course, in many instances, lead to a permanent instead of a temporary change of language. The other fact upon this head is the sacred languages employed by the conjurors or priests. As far as this has been accurately found out, for instance, in the Greenlandic, it seems to be chiefly an arbitrary pervers-

Language. sion of the significations of old and known words. It is then the same principle as in Europe has formed any slang, for instance, among vagrants and thieves. Yet these words of the conjurers have been so far altered that any double meaning is sufficiently avoided.

"From the effect of these causes it appears probable that as one savage tribe may, from trifling occasions, suddenly split into two, that separate widely from each other, thus also their language may, in a comparatively short time, deviate into two very different dialects. If there were means of investigating the state of a given language of savages in different periods, it would perhaps be demonstrable that its formation as a peculiar dialect, or a variety of speech, does not require those thousands of years, as one might suppose, who starts from the fact, that a great many Greek and Hebrew words have been preserved uncorrupted for thousands of years, through the influence of literature and civilization."

ON THE LANGUAGES OF AFRICA.

Our data for the investigation of the African languages are greater than we expect *à priori*. Many unexplored districts are known in respect to their philology. This is because missionaries, and other investigators, have taken down the accounts of slaves transported from the more inaccessible portions of the continent to either localities on the coast, or to America.

The general distribution of the African languages is that of the languages of the rest of the world, viz., irregular in respect to the different areas of the different tongues. This means that sometimes a single form of speech, with either a paucity of dialects and sub-dialects, or else with a slight amount of difference between its extreme forms, is spread over a large extent of country; whereas, on the other hand, a small tract of land shall contain several mutually unintelligible tongues. The Berber, the Fulah, and the Kaffir tongues are remarkable for the ground they cover; all the parts S. of the equator, with the exception of the Hottentot, being Kaffir, and all the parts N. of Negroland, with the exception of the Arabic and Tibboo districts, being Berber.

The small areas with the greatest number of mutually unintelligible tongues, are the alluvial tracts between the Gambia and Cape Mount, *i.e.*, the deltas and valleys of the Casamansa, Rio Grande, Nunez, &c., then certain districts in Abyssinia.

The areas of moderate or intermediate magnitude are those of the Hausa, Woloff, Mandingo, &c.

The evidence that all the languages of Africa are related to each other is, in the mind of the present writer, though not, perhaps, to the majority of investigators, conclusive. This rests upon two series of facts—the accumulation of new materials and the breaking down of distinctions which at first sight appear more definite and trenchant than they really are.

This latter process has taken place most especially with the tongues of the extreme N. and the extreme S.

To begin with the former. The languages akin to the Hebrew and Arabic—Semitic as they are called—were long either isolated, or, if connected with those of any other class, connected with the so-called Indo-European forms of speech. This was on the strength of the higher civilization, greater historical importance, and superior physical organization of the nations which spoke them. Writers, however, were not slow to observe that the populations of Northern Africa in general were, to a great extent, possessed of the same characteristics. Such were the Egyptians, whose language was the Coptic, a language which was one of the first to be recognised as one exhibiting Semitic characteristics. This was not doubted. It was only doubted whether the Coptic was, in the ordinary sense of the word, African.

Then came a language to which the French conquest of Algeria gave prominence, whilst it also made it accessible; the language of the Kabyles, Tuaricks, Siwans, and Canary islanders. This was recognised, if not as actually Semitic, as what was designated by the new term, *sub-Semitic*.

That other tongues, especially those in geographical contact with the Kabyle (Berber or Amazirgh), were, more or less, what the Berber was, was shown by even the Berber scholars; the foremost of whom recognised, in the Hausa of Sudania, Berber elements. (See a paper by Francis Newman in the Appendix to Pritchard's *Physical History of Man*.)

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Then came the turn for the tongues to the south of the Coptic area to be considered as, more or less, Coptic; *e.g.*, the Bisharye, the Nubian, and the Galla; and, finally, that for the languages of Abyssinia in contact with the recognised Semitic tongues (such as the Tigre, Amharic, &c.), but not themselves Semitic. Of these, the Agow and Falasha forms of speech are the chief.

With this relation between the Semitic and sub-Semitic classes—a relation made patent by the name itself—the question as to the relations of the African languages at large must either remain stationary, or one of two alternatives be resorted to.

Either languages like the Hausa, Nubian, Agow, &c., must lead to the true Negro tongues, or they must be wholly separated from them. It is not too much to say that, on the part of the proper Semitic philologues, the tendency was towards separation. This, however, was impossible. Whoever knew anything of the other African languages knew that for every step from such languages as the Coptic and Berber, towards the Hebrew and Arabic, a similar advance could be made in the opposite direction, *i.e.*, towards the Fellatah, Mandingo, and Woloff, and through these to the most Negro languages of the whole continent.

On the south there are the same apparent differences, and the same abrogation of them; two languages coming more especially under notice,—

1. *The Hottentot*.—It is doubtful whether the presumed isolation of the Hottentot forms of speech rests on purely philologic grounds; indeed, it is pretty certain that it does not. The same is the case with the Semitic and sub-Semitic tongues, wherein physical difference has as much to do as glossarial. The contrast between the Bushman, and not only the so-called higher races in general, but his immediate neighbours, is great. At the same time, there are many more transitional and intermediate forms than is generally believed, especially in the northern parts of the Hottentot area. The articulate sound described as a *click* characterizes the Hottentot languages. Like most points of phonesis, its import has been overvalued. It is not limited to the Hottentot, and would not prove isolation if it were. More than one Kaffir dialect has it. Then there is a kind of gender in the Hottentot grammar; a fact which has led some able philologists to the preposterous doctrine, that it has an affinity with the more cultivated tongues of Europe. It has some Kaffir affinities too, and others (perhaps more numerous) with the languages N. of the Kaffir area—a matter that should by no means surprise us, inasmuch as the amount of displacement along the whole frontier has been great.

The comparison of the scanty specimens of a scanty language gives us the following miscellaneous Hottentot (*H*) affinities with the other languages of Africa (*A*):—

<i>English</i>	sun.	<i>English</i>	mountain.
<i>H. S</i>	<i>i'kora.</i>	<i>H. Corana</i>	<i>teub.</i>
Hottentot	<i>sorre.</i>	<i>A. Falasha</i>	<i>duba.</i>
Corana	<i>sorob.</i>	<i>English</i>	ear.
<i>A. Agow</i>	<i>quorah.</i>	<i>H. Corana</i>	<i>i'naum.</i>
Somauli	<i>ghurrah.</i>	<i>A. Bullom</i>	<i>naimu.</i>
Kru	<i>gruro.</i>	<i>English</i>	star.
Kanga	<i>jiro.</i>	<i>H. Corana</i>	<i>kambrokoa.</i>
Wawu	<i>jiirri.</i>	<i>A. Kossa</i>	<i>rumbereki.</i>
<i>English</i>	tongue.	<i>English</i>	bird.
<i>H. Corana</i>	<i>tamma.</i>	<i>H. Bushman</i>	<i>i'kanni</i>
Bushman	<i>i'inn.</i>	<i>A. Mandingo</i>	<i>kuno.</i>
<i>A. Fertit</i>	<i>timi.</i>	<i>English</i>	sleep.
<i>English</i>	neck.	<i>H. Corana</i>	<i>i'kchom.</i>
<i>H. Bushman</i>	<i>i'kau.</i>	Bushman	<i>i'koing.</i>
<i>A. Darfur</i>	<i>kiu.</i>	<i>A. Susu</i>	<i>kima.</i>
<i>English</i>	hand.	Howssa	<i>kuana.</i>
<i>H. Corana</i>	<i>i'koam.</i>	<i>English</i>	fire.
<i>A. Shilluck</i>	<i>kiam.</i>	<i>H. Corana</i>	<i>taib.</i>
<i>English</i>	tree.	Congo.	<i>tubia.</i>
<i>H. Corana</i>	<i>peikoa.</i>	Somauli	<i>dub.</i>
Bushman	<i>i'hauki.</i>	Bushman	<i>i'jih.</i>
<i>A. Shilluck</i>	<i>yuke.</i>		

Language.	A. Fot	dia.	A. Howssa	sha.
	Ashanti	oja.		
	English	neck.	English	star.
H. Bushman		i'kau.	H. Bushman	ikoati.
A. Makua		ichico.	A. Bagnon	hoquoud.
			Fulah	kodé.
	English	die.	English	child.
H. Corana		i'koo.	H. Corana	i'kob.
Bushman		ikuki.	Bushman	i'katkoang.
A. Makua		ocoo=dead.	A. Bagnon	colden.
	English	good.	Timmani	kalent.
H. Corana		i'kain.	Bullom	ishant.
Bushman		tetsini.		
A. Makua		oni-touny.	English	tree.
	English	foot.	H. Bushman	i'hu.
H. Corana		i'nah.	A. Seracolé, &c. etc.	
Hottentot		i'noah.		
A. Makua		nyahai.	English	foot.
	English	drink.	H. Corana	i'ketb.
H. Corana		i'kchaa.	Bushman	i'koah.
			A. Sereres	akiaf.
			Waag Agau	tsab.

In respect to the so-called genders, the following table shows how little they are those of the European languages. The forms are simply compounds. They are taken from the *Abriß der Formellehre der Namaqua-Sprache* (Barmen, 1854); the German *ich, dur, &c.*, being translated into Latin:—

I.			II.		
MASC.		FEM.			COM.
Ta	<i>Ego</i>	Ta	<i>ego</i>	Ta	<i>ego.</i>
Ke	<i>nos</i>	Se	<i>nos</i>	Da	<i>nos.</i>
Khom	} <i>nos ambo</i>	Tm	} <i>nos ambo</i>	Um	} <i>nos ambo.</i>
Khoma		Tma		Uma	
III.					
B, ba	<i>is</i>	" S, se	<i>ea</i>	T, e	<i>is, ea.</i>
Ku, ka	<i>ii</i>	Ti, te	<i>ea</i>	N, na	<i>ii, ea.</i>
Kha	<i>ii ambo</i>	Ra	<i>ea ambo</i>	Ra	<i>ii (ea) ambo.</i>

Te = mei, mhi, me, meus, mea, meum.
 Zi = tui, tibi, te, tuus—Masc.
 Si = tui, tibi, te, tua—Fem.
 U = tui, tibi, te, tuus, tua, tuum (?)—Com. (?).
 Bi = sui, sibi, se, suus, sua, suum.
 Si = eos, eorum, earum, eorum.
 Du = vestrum, vos, vester, vestra, vestrum.

	MASC.	FEM.	COM.
Au-ta	vir ego	Tara-ta ¹	Koi-ta. ²
Au-ke	vir nos	Tara-se	Koi-da.
Au-khom	viri nos ambo	Tar-aim	Koi-um.
Au-khom-a		Tar-aima	Koi-uma.
Au-z	viri tu	Tara-s	Koi-s.
Au-ze		Tara-se	Koi-se.
Au-ko	viri vos	Tara-so	Koi-do.
Au-kho	viri vos ambo	Tara-ro	Koi-ro.
Au-b	vir is	Tara-s	Koi-i.
Au-ba		Tara-sa	Koi-e.
Au-ku	vir ii	Tara-ti	Koi-n.
Au-ka		Tara-te	Koi-na.
Au-kha	viri ii ambo	Tara-ra	Koi-ra.

¹ Mulier ego, &c., as *Homo ego*.

² *Homo ego* (Mensch), &c., as with the other two.

By turning to the Lexicon, we find, *aub*, man; *aus*, woman; *awi*, person; *taras*, woman; *koib*, man; *kois*, woman; *koii*, person (Germ. *mensch*). There is an expression of sex here, but no true gender.

The *Kaffir* tongues have two notable characteristics,—(1.) Alliteration; (2.) The system of prefixes.

According to the former, when two words stand in certain

grammatical relations to one another, the initial letter of the subordinate is changed to that of the governing term, just as if we said, in English, *bun-beam* instead of *sun-beam*.

According to the latter, every noun has, as its concomitant, some non-radical prefix, so necessary, that when the missionaries would introduce such English words as *priest* or *pharisee*, the form they gave them in Kaffir was *um-priest*, *um-pharisee*.

These two characteristics give a very remarkable physiognomy to the language. Doing this, they have a tendency to create broad and definite lines of demarcation. Hence the separation between the Semitic tongues on the N. and the inland and western dialects, is repeated in the S. between the Kaffir and the non-Kaffir languages.

The ethnological import of the two characteristics in question has never been very closely considered. They may mean much; they may mean little.

Their absence may separate languages, otherwise like, from the Kaffir; their presence may connect languages otherwise unlike. So, at least, was the opinion of many investigators; for the fact suggested is a real one.

Both have been discovered elsewhere. The Timmani is a language of the parts about Sierra Leone. It is a language of Northern Africa. That it exhibits the so-called characteristics of the Kaffir tongues of South Africa, is notified by Bishop Vidal in the preface to his edition of Crowther's *Toruba Grammar*. Mr Norriss had, by independent researches, arrived at the same conclusion.

The import of this coincidence is another question. That the most northern of all the Negro languages, the Woloff, exhibited a remarkable series of euphonic initial changes, had been known since the time of Dard. The Woloff changes, however, were not so Kaffir as the Timmani.

But there is another series of facts. The language of all the languages of Africa, wherein the Kaffir characters are at a minimum, is the Mandingo—at least in the proper Mandingo dialect. Writers who have made everything that was Kaffir-like Kaffir, have still left the Mandingo undisturbed. The most that has been done towards even approximating it to Kaffir-like languages has been done by Mr Norriss and Dr Bleek. The former has suggested the likelihood of the signs having been lost—obscure traces of them still being discoverable. The latter has, at one and the same time, pronounced the Grebo dialects to be Mandingo, in respect to the class to which they belong, and South African (Kaffir) in their structure.

But the Timmani is connected by its vocabulary with the Mandingo,—not directly, but still as a member of the same class; that class being one of no inordinate magnitude, and one which does not contain the Kaffir; one, too, which the geographical conditions indicate as likely. How does this affect our classification? Much more than it ought to do. The present tendencies are to make everything Kaffir. True criticism only tells us to look twice before we allow a single characteristic to become the basis of a classification. Naturalists know this. Philologists have yet to learn it. In the mind of the present writer, the Timmani, and other languages in the same category, are Kaffir, in the way that an eel is a snake, a whale a fish, or a bat a bird.

There is another preliminary to the classification of the languages of Africa. We cannot treat them as we treat those of Europe. Everything in Europe is definite; i.e., it is Latin or Greek, German or Celtic, Sarmatian or Turkish,—there being no such thing as an intermediate, transitional, or equivocal form. Hence, we can classify by *definition*, separating tongue from tongue. In Africa we must classify by *type*; i.e., group certain forms of speech round certain others, without being able to separate the outlying members of one class from the outlying members of another. This makes the place of many forms of speech equivocal,—equivocal rather than actually doubtful or obscure. They may belong to two classes at once.

Thus guarded against the expectation of finding greater definitude than the nature of the inquiry will allow, we begin with the parts where Asia and Africa join, and where the (so-called) Semitic touch the (so-called)---

I. *Sub-Semitic* form of speech:—

- (1) Berber (which leads to the Hausa, Tibbu, and Bornui.
- (2) Coptic (which leads to the Bishari, Nubian, and Galla.
- (3) The Gafat, Agow, and allied tongues of Abyssinia.

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- II. The *Nubian* group, containing:—
 (a.) The Kensy, Noub, and Barabra of the specimens, the Dongolawy of Dongola.
 (b.) The Koldaji of Kordovan.
 (c.) The Shelluk, Denka, Takeli, Tumali, Shabun, and Fer- tit of the parts to the S. of Kordovan.
 (d.) The Furian of Darfur, allied to—
 III. The *Bisharye*, between the Nile and Red Sea; and,
 IV. The *Fazoglo* and *Qamamyl* of Bertat.
 To the west of Darfur follow—
 V. The *Borgho* (of Wadai or Darseleh).
 VI. The *Begharmi*.
 VII. The *Mandara*.
 VIII. The *Bornui* or *Canowry* group; which will, prob- ably, when better known, be more closely connected with each other, and also with—
 IX. The *Tibbu* of the eastern part of the desert.
 To the W. of Bornu lie the languages of—
 X. The *Hausa*; and—
 XI. The *native* language of the parts about Timbuctu.
 XII. The *Fulah* groups, leading to the complex philology of the languages known to us on the coast of the Atlantic. Between the southern boundary of the desert and the equator we find, passing from N. to S.—
 XIII. The *Woloff* of the Gambia.
 XIV. The *Mandingo* of the Senegal.
 XV. The *Felup*, &c., for the mouths of the Nunez, Río Grande, &c.
 XVI. The *Grebo* or *Kru*, of the parts about Cape Palmas; passing through—
 XVII. *Avekvom*, of the Ivory Coast, to—
 XVIII. The *Gold Coast* group, containing,—
 (a.) The Fanti (Ashanti);
 (b.) Acra (Cape Castle);
 (c.) Whidah (of Dahomey).
 Akin to which are—
 XIX. The *Yoruba*.
 XX. The *Ibo* (of the Lower Niger).
 XXI. The *Nuñi* (of the Tshadda) leading through—
 XXII–XXIII. The *Efik* of Old Calabar, and the Fernando
 Po language, to—
 XXIV. The *Empoonga* of the Gaboon.
 XXV. The *Bati* of Adamova has miscellaneous affinities with the language last mentioned, and with—
 XXVI. The great *Kaffir* class, which reaches to—
 XXVII. The *Hottentot* area. On the E., Kaffir languages are spoken as far N. as (there or thereabouts) the equator, where they are contemporaneous with a transitional form of speech.
 XXVIII. The *Ukuañi*; and also with—
 XXIX. The *Galla*, which leads us up to Nubia and Abyssinia.
 In the interior, a class of languages spoken by the negroes of Abyssinia is represented by—
 XXX. The *Darmichegan*; and—
 XXXI. The *Tacaze* vocabularies of the specimens; and further inland still, to the S.W. of Abyssinia, we find consti- tuting a class conveniently called—
 XXXII. The *Gonga*, the *Kaffa*, *Woratta*, *Wolaita*, and *Yangaro* forms of speech.
 It is not pretended that the value of all these groups is the same. It is only submitted that there is no African language, hitherto known (and, with few exceptions, all are known), which cannot be referred to some of the previous groups. It is also added, that they have all miscellaneous affinities; in other words, there is no such a thing as isolation.
 The preceding arrangement is a modification of one laid before the British Association for the Advancement of Science in 1844, and expanded (with slight modifications) in 1847, the original form being as follows. It is given for the sake of foreshadowing the more complex classification of divisions and sub-divisions of higher and lower groups, &c., which a more advanced state of our investigations will require.
 1. The Coptic class, containing the extinct dialects of Egypt.
 2. The Berber class, containing the *non-Arabic* languages of northern Africa.
 3. The *Hottentot* class.
 4. The *Kaffir* class, extending from the limits of the Hot- tentot country as far northward as Loango, and the River Juba W. and E.

5. The fifth and last class, which was left unnamed, fell into Language. eleven subordinate groups?—

- | | |
|------------------------|----------------------------|
| 1. The Nubian group. | 7. The Hawssa group. |
| 2. The Galla group. | 8. The Mandingo group. |
| 3. The Borgho group. | 9. The Woloff group. |
| 4. The Begharmi group. | 10. The Fulah group. |
| 5. The Bornu group. | 11. The Ibo-Ashanti group. |
| 6. The Mandara group. | |

Of these groups the ten first were undivided; whilst the eleventh fell into the following sub-divisions:—

- | | |
|--------------------------------|-------------------------------|
| α The Fantee division. | δ The Ibo division. |
| β The Acra division. | ϵ The Nuñi division. |
| γ The Dahomey division. | ζ The Yoruba division. |

Notwithstanding these sub-divisions, the following languages remained unplaced:—

- | | |
|---------------------------|-----------------|
| 1. The Agow dialects. | 4. The Sereres. |
| 2. The Bisharye dialects. | 5. The Akvambu. |
| 3. The Serawoolli. | 6. The Kru. |

These last are now distributed as follows:—The first is sub- Semitic; the second allied to the Nubian and Coptic: the third and fourth Mandingo, with Fulah elements; the fifth Fanti; the sixth intermediate to the Mandingo and Fanti.

The Mandingo, Kru, Ashanti, Woloff, and Fulah will, prob- ably, be brought by future researches more closely together.

That this classification is right in its main elements is ren- dered probable by the confirmation it has received from sub- sequent investigations. The *Polyglotta Africana* of Mr Kölle (published in 1854), as far as it goes—which is to the extent that specimens collected at Sierra Leone carried the writer— gives the same groups, though under different names, the in- vestigation being (I believe) independent. Thus Kölle's:—

I. *North-western Atlantic* languages fall into four groups, represented by the (a.) Felup, (b.) Pepel, (c.) Biafada, and (d.) Timmani languages, respectively each falling into dialects and subdialects.

II. The *North-western High Sudan*, or *Mandingo* lan- guages, constitute the second group.

III. The *Upper Guinea*, or *Middle-coast* languages, the third. This means, the forms of speech akin to (a.) the Kru, (b.) the Dahomey, (c.) the Yoruba.

IV. The *North-eastern High Sudan* languages are spoken inland, at the back of the Ashanti country, and along the eastern range of the Kong Mountains. They are akin to the (a.) Mosee, (b.) Kouri, (c.) Koama, and (d.) Yula forms of speech.

V. The *Niger-delta* group falls into the (a.) Isoama, (b.) Sobo, and (c.) Okuloma divisions.

VI. The *Niger-Tshadda* languages as those akin to the Nuñi.

VII. The *Central African* division contains the languages allied to (a.) the Bornui, and (b.) the Pika.

In Part II. we have the *South African languages distin- guished by an initial inflection*, as has been already stated. It excludes the *Hottentot*, and includes the Old Calabar, Came- roon and Gaboon languages. Doing this, it coincides with the so-called Kaffir class of tongues, in its latest form, i.e., in the form it has taken since it was shown that the Poongwe, the Isubu, the Efik, and other languages, exhibit a similar series of initial changes to those of the Kaffir and Bichuana.

There are of course some differences of detail; the main groups, however, are the same. The first is one for which de- tails were especially wanted. The fourth also is important. It should probably form a separate substantive division of the group called Ibo-Ashanti.

If the foregoing is what the writer believes it to be, viz., the sketch of the classification into which the languages of Africa ought to fall, it is far from being that which the very newest investigations have suggested. The very newest investigations are those of which Mr Norriss, Dr Bleek, and Mr Kölle are the chief representatives; and, in a less degree, perhaps, Professor Lepsius. It is the overvaluation of the Kaffir characteristics (along with certain other points of less importance) that makes these arrangements exceptionable; and it is this against which the preliminary criticism of the previous pages is directed.

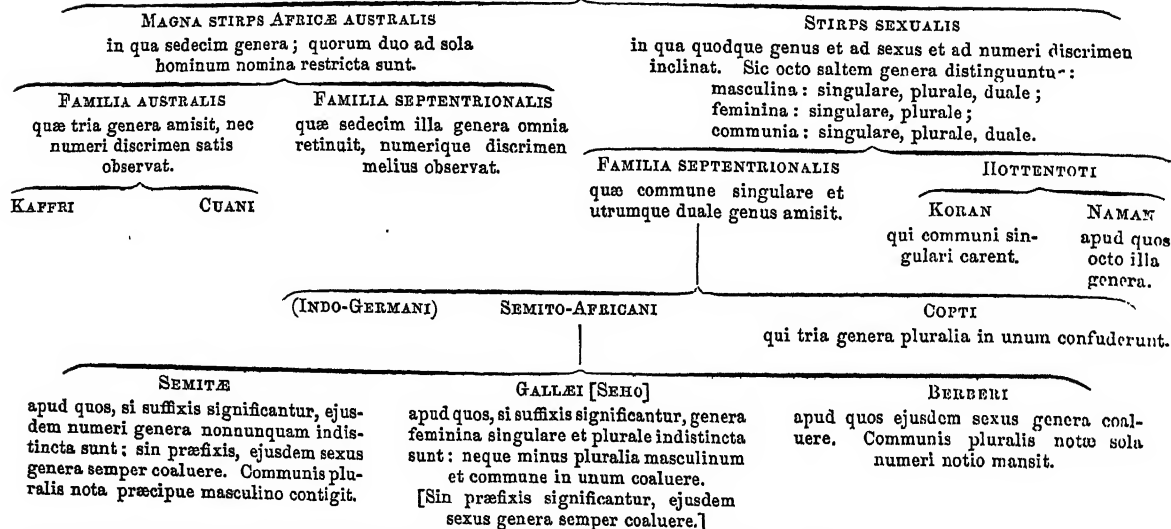
Lest it should be thought unnecessary, I subjoin the follow- ing table from Dr Bleek's paper, *De Nominum Generibus*:—

Language.

LINGUA MATER

Language.

in qua pronomina e nominum particulis derivativis petita sunt, ideoque nomina
in genera dispersa quæ cum naturæ discriminibus non congruunt.



One of the best measures of the truth of a principle, is to be found in the result to which it leads. Here we have one, which, separating the Hottentots from the Kaffirs, connects them with the Egyptians, Algerians (Berberi), Gallas, Jews, and Arabs (Semitæ), and, finally (though more indirectly), with the Sclavonians, Germans, Greeks, and Latins (Indo-Germani). This is what it comes to when we classify on the strength of a single characteristic. The actual details of the ethnographical philology of Africa are important. The principle, however, on which investigators arrive at them is much more so.

To conclude: The preface of a work, not two months old,—*The Languages of the Mozambique, or Vocabularies of the Dialects of Lourenço Marques, Inhambane, Sofala, &c.*, from the MSS. of Dr Peters, by Dr Bleek,—contains the following passage: "The languages of these vocabularies all belong to that great family which, with the exception of the Hottentot dialects, includes the whole of South Africa, and most of the tongues of Western Africa, &c. If so, and if the table be equally accurate, the affinities of the Bushman are with the Parisian, the Londoner, and the Athenian, rather than with the Negro of the Gold Coast, or Sierra Leone.

It is the old error—a bat has wings, therefore it is a bird; an oyster lives in the sea, therefore it is a fish; and so on through the whole range of possible misnomers.

On the so-called Indo-European Class.

As this stands, it contains, according to *all* authorities, the Keltic, the German, the Sarmatian, the Classical (the Latin and Greek), and Sanscrit groups. To these many (perhaps most) add the Armenian and Ossete; some the Albanian. In respect to the import of these terms, the ordinary views make *Gothic and German* nearly synonymous, and Sanscrit the name of a language of *Asiatic* origin, to which the Zend was allied, and out of which and its congeners some Indian and Persian forms of speech have been developed, and to which they are allied, as the Italian, &c., is to the Latin. The greater part of this is believed by the present writer to rest on an illegitimate amount of assumption.

Firstly, that the Keltic was not isolated, but allied to the German, Sclavonic, &c., was shown by Dr Prichard, and excellent service he did in showing it. But that it is allied to these tongues, *as they are to each other*, has never been shown. Yet this is what is wanted, in order to make an addition to a class *without raising its value*. This, however, should never be done without consideration. The principle upon which the value of a class is raised, in order to admit one addition, may be extended so far that, by successive increases of value, it may be no class at all; as the so-called Indo-European class is in a

fair way of becoming. Good reasons can be given for limiting rather than widening it. It can, of course, when thus limited, be subordinated to some other.

Secondly, In respect to the German division, a vast superstructure totters as soon as we inquire for evidence to the assumed fact of any German population whatever having been called *Goth* anterior to its settlement in the country of the Getæ. No such evidence exists. On the contrary, the Germans were Goths as they were Britons, *i.e.*, occupants of British soil, but no Britons at all—nor yet Goths.

Thirdly, The philological evidence of the Sanscrit being of Asiatic origin is that of the Latin of Spain having been Hispanian; certainly no better. It consists in the fact of its appearing on the soil at an early (admittedly a very early) period; a literature indigenous to the Indian soil having existed in it, along with inscriptions, and a certain amount of influence upon the later language. In India, the appearance of the Sanscrit on the soil is earlier than that of the Latin in Spain. On the other hand, no one has doubted the Latin origin of the Spanish language, whilst more than one competent judge has doubted the Sanscrit origin of the Hindui, Bengalee, &c. Yet we know from history that the Latin of Spain was not only not indigenous to the Peninsula, but that it was not even derived from the next country. All that rests upon legitimate inference, in respect to the Sanscrit in India, are the facts of its early introduction and the greatness of its subsequent influence. Its Indian origin, its Persian origin, and the like, are all based upon covert, but undue, assumptions.

Akin to these are the explanations of the affinity between the Sanscrit on the one side, and the Lithuanic, Slavonic, Latin, Greek, and German on the other. The latter are deduced from Asia, *i.e.*, five species of a genus are deduced from the scite of one, instead of the one from the scite of the other five. This is all improbable, except so far as it can be shown that the Dnieper and Danube are nearer to the Indus and Ganges than the Ganges and Indus are to the Danube and Dnieper.

The Asiatic origin of the Greek, Latin, Lithuanic, Slavonic, German, and Keltic, has been assumed at once, without any consideration whatever of the other alternative, *viz.*, the European origin of the Sanscrit. This is over-hasty.

The recent deductions from the Ossete, and its Indo-European affinities, verify what has been said concerning the Keltic. Whatever the Ossete is, the Georgian is also; and the Georgian has been made Indo-European. But what the Georgian is, the Circassian is; which is more Chinese than Greek, more Tibetan than Latin, more Burmese than German. Classifications of this kind prove too much.

It is held that the class in question is most conveniently limited to (1.) the German; (2.) the Classical (Greek and

Language. Latin); (3.) the Sarmatian; and (4.) the Sanscrit groups,—the two last, perhaps, belonging to the same division.

At any rate, the principles upon which the ordinary division has been formed, along with its name, and many important details in the way of fact, require revision.

Gessner, *Mithridates de Differentiis Linguarum*, Zurich, 1555, 8vo; Megiser, *Specimen XL. Linguarum*, 1592; Duret, *Thésor de l'Histoire des Langues*, 4to; Luideken (Müller), *Specimina Linguarum*, Berl. 1680; Chamberlayne, *Oratio Dominica*, Amst. 1715; Schultz, *Orientalischer und Occidentalischer Sprachmeister*, Leipz. 1748; Hervas, *Saggio*, Hervas, *Idea dell' Universo*, Cesenn. 1778-87, vols. xvii.-xxi. 4to; *Vocabularia Comparativa*, 2 vols. 4to, Petersburg, 1787, 4 vols. 1790; Bergmann, *Specimina*, Ruen, 1789; Marsden's *Catalogue of Dictionaries and Grammars*, 1796; Marcel, *Oratio Dominica*, Paris, 1805; Adelung und Vater, *Mithridates, oder Allegemeine Sprachkunde*, 4 vols. 8vo, Berlin, 1806-17; Le Pileur, *Traitéaux Synoptiques de Mots similaires*, 8vo, Paris and Amst. 1812; Jamieson's *Hermes Scythicus*, 8vo, Edin. 1814; Townsend's *Character of Moses*, vol. ii., 4to, Bath, 1815; Leyden, *Asiatic Researches*, x.: *Brief View of the Baptist Missions and Transactions*, 8vo, Lond. 1815; Vater, *Index Linguarum totius Orbis*, 8vo, Berl. 1815; Vater, *Proben Deutscher Mundarten*; Seetzens *Nachlass*, 8vo, Leipz. 1816; Arndt, *Ursprung und Verwandtschaft der Europäischen Sprachen*, 8vo, Frankfurt, 1818, compared with the Russian; Volney, *sur l'Etude Philosophique des Langues*, 2d edit., 8vo, Paris, 1820, laments that he has not the happiness to understand German.

Bopp, *Vergleichende Grammatik*; Grimm, *Deutsche Sprache*; *Deutsche Grammatik*, &c.; Jülg, *Supplement to the Mithridates*; Humboldt (K. W. von), *Ueber die Kawi Sprache*; Craufurd's

Indian Archipelago; *Malay Dictionary* (Introduction); Klaproth, *Language Asia Polyglotta*; Hodgson, chiefly in *Journal of the Asiatic Society of Bengal* (for India, Nepal, Tibet); Logan, in *Journal of Asiatic Society* (for the Malayan Peninsula and Indian Archipelago); Rask, *Om Zendsproget og Zendavestas Aldre og Agethed*, &c. For the Fin branch, consult works of Sjögren and Castrén (the latter most especially); *Samojed Grammar*; *Ostiak Grammar*; also papers in the *Transactions of the Royal Academy of Sciences of Berlin*, by Schott, Gabelentz, &c.; Prichard, *Eastern Origin of the Celtic Nations*; Kælle, *Polyglotta Africana*; Newman (Francis W.), *Berber Grammar*, and short papers; Dard, *Grammaire Wolofe*; Schön, *Haussa Grammar*; Machrair, *Mandingo do.*; Crowther, *Yoruba do.*, and *Fulah do.*; Tutschek, *Grammar of the Galla*, and of the *Tumah Language*; Latham, *Report in Transactions of British Association*, 1847 (*Africa*); Riis, *Grammatik der Odschi (Ashanti) Sprache*; *Grammars of the Baka*, and other languages akin to the Kafir, by the American Missionaries of the Gaboon station; Rev. J. Mackay, *Grammar of the Banga Language*; Boyce, *Kafir Grammar*; Archbell, *Beehuana Grammar*; Koelle, *Bornu Grammar*; Dr Bleek, *De Nominum Generibus Linguarum Africæ, Australis, Copticæ, Semiticarum, aliarumque sexualium*; Appleyard, *The Kafir Language*, &c.; Krapf, *Outline of Elements of the Kenaheli Language*.

For America, see Ludvig, *Bibliotheca Glottica*; Gallatin, *Transactions of the American Ethnological Society*, vols. i. and ii.; *American Archaeological Society*, vol. ii. Hale, *Philology to the United States Exploring Expedition*; *Travels of Prince Maximilian of Newwied, and of Castelnau* (chiefly for Brazil); D'Orbigny, *L'homme Americain*; Schoolcraft, *Indian Tribes*; Squier, *Nicaragua and Central America* (Spanish edition), for Honduras; Seeman, *Voyage of the Herald* (for the Isthmus of Darien). (T. Y.) (R. G. L.)

LANGUEDOC, (the ancient *Narbonensis Prima*), an old province of the S. of France, of which Toulouse was the capital, now forming the departments of Haute-Loire, Lozère, Ardèche, Gard, Hérault, Aude, and Tarn, the greater part of Haute-Garonne, and a part of Tarn-et-Garonne. As a Roman province, it enjoyed the freedom of Italy. It formed part of Gallia Narbonensis, but, in the middle ages, was known as Septimania from the seven cathedral churches which it contained. From the hands of the Romans, it passed into the possession of the Goths; and, being wrested from them, it was occupied by the Saracens till 725, when they were expelled by Charles Martel. It afterwards came under the sway of Philip the Bold, and became a part of the French kingdom in 1361. During the old Bourbon monarchy, Languedoc had a kind of parliament of its own, of which the archbishop of Narbonne was the perpetual president. The canal of Languedoc is 153 miles in length, commencing in the Garonne, near Toulouse, and terminating in the Lake of Thau and the Mediterranean. See FRANCE.

LANNION (the ancient *Lanium*), a town and river-port of France, capital of a cognominal arrondissement in the department of Côtes-du-Nord, on the right bank of the Guer, near its mouth, 35 miles W.N.W. from St Brieuc. It has manufactures of linen fabrics, leather, hats, ropes, and refined wax; and carries on a trade in flax, hemp, thread, corn, cider, wine, timber, and colonial produce. Its harbour admits vessels of a burthen less than 200 tons. Pop. (1851) 6075.

LANTAO, a small island of China, at the mouth of the Canton River, about 10 miles W. of Hong Kong. It is 15 miles in length from E. to W., by 5 in breadth; has a very uneven surface, and a coast indented by numerous bays.

LANUVIUM, now CIVITA LAVINIA, an old and important city of Latium, on the Appian Way, about 20 miles S. of Rome. Tradition describes it as a colony from Alba, but it first rose to importance in the fifth century B.C., when it took part against Rome as one of the thirty cities of the Latin League. After this date its name does not again appear in history, till, in the long wars between Rome and the Æqui and Volsci, it is found siding with Rome. For some unexplained reason, it changed sides in B.C. 383, but was leniently treated by its old ally at the end of the war. In

the great Latin war, B.C. 340, it again took part against Rome, and, in the general settlement at the close of hostilities, it obtained the Roman civitas, but without the suffragium. At a later period it obtained the suffrage also. After the time of Cicero, Lanuvium became a mere municipal town, and was only important as the chief seat of the worship of Juno Sospita, whose rites were celebrated first by the Lanuvians, and afterwards by the Romans, with great pomp and splendour. Lanuvium was the birthplace of the Emperor Antoninus Pius, who often went to live there, as did also his successors, M. Aurelius and Commodus. The little town of Civita Lavinia occupies part of the site of the old Lanuvium. Some shapeless ruins in the neighbourhood are supposed to mark the site of the temple of Juno; and a small portion of a theatre has also been brought to light.

LANZEROTE. See CANARY ISLANDS.

LANZI, LUIGI, a celebrated Italian archaeologist, and the historian of Italian art, was born in 1732, at Monte dell' Almo (*Ulmodynamum*), near Fermo, in the States of the Church. He was carefully trained at home, and made great and rapid progress, especially in the classics. Cicero was his favourite author. He used to boast that he knew nearly all his works off by heart. In his eighteenth year he joined the Jesuits, studied at their college in Fermo under the celebrated Boscovich, taught publicly in various schools, and made himself a considerable name as a teacher and elegant writer. When the order of Jesus was suppressed, he adopted the career of letters. In 1775, Leopold, Grand Duke of Tuscany, made him sub-director, and, in the following year, *antiquario*, or conservator, of the Florentine Gallery. The next six years of his life were spent in preparing his *Guida della Galleria di Firenze*, in which the history of the objects in the collection is traced with great learning and critical skill, and, at the same time, so agreeably as to interest the mere pleasure-seeker. In 1789 he published his *Saggio di lingua Etrusca*. His design in this essay was to draw the attention of scholars to the archaeology of Tuscany; and he may be said by it to have created this difficult branch of erudition. Before his day native antiquarians had been in the habit of elevating the civilization of Etruria, by maintaining that its religion and mythology owed nothing to Grecian influence. Lanzi, taking a different

Lanzerote
||
Laocoon.

view, claimed a Greek origin for both, and his opinion has been followed by continental scholars. His *Saggio* was a work of immense erudition and research, and placed him at the head of the antiquarians of modern Italy. In the course of his wanderings through Italy in quest of materials for these works, Lanzi had conceived the idea of a general history of Italian art. He was encouraged in the idea by his old friend and colleague, Tiraboschi, who had some time before completed his own history of Italian literature. The *Storia Pittorica della Italia* came in time to supply a want that had long been felt. There was no general history of painting, and the histories of particular epochs, as well as the biographies of individual artists, merely recorded the private opinions and prejudices of their authors. They were all partial, and without method, or a philosophical standard of taste and criticism. Lanzi, following out the plan of Winckelmann, gives a separate history of each school. After giving its general character, he distinguishes it into three, four, or more epochs, according as its style underwent changes with the change of taste, in the same way that the eras of civil history are deduced from revolutions in governments, or other remarkable events. A few celebrated painters, who swayed the public taste, and gave a new tone to the art, are placed at the head of each epoch; and their style is particularly described, because the general and characteristic taste of the age was formed upon their models. Their immediate pupils and other disciples follow the great masters; and, without a repetition of the general character, reference is made to what each has borrowed, altered, or added to the style of the founder of the school. This method, though not susceptible of strict chronological order, is much better adapted to a history of art than either an alphabetic arrangement or a body of separate lives. The first portion of the *Storia Pittorica*, containing the schools of Lower Italy—that is, the Florentine, Siennese, Roman, and Neapolitan schools—was published in 1792. The publication of the rest of the work was delayed by the author's bad health, and only appeared in 1796, at Bassano, whither he had gone to recruit. There is a good translation of it in English by Thomas Roscoe. When the French became masters of that part of Italy, Lanzi retired to Treviso, and afterwards to Udine. In the latter city he remained till 1801, when he returned to Florence, and resumed his duties in the ducal gallery. Soon after his return, he was made president of the Cruscan Academy. His next literary undertaking was three dissertations upon *Ancient Painted Vases, commonly called Etruscan*, which he followed up with his learned and pleasantly written *Inscriptionum et Carminum libri tres*. Among his latest productions may be mentioned his edition of Hesiod's *Works and Days*, with valuable notes, and a translation in *terza rima*. It had been begun as far back as 1785; but was re-cast and completed in 1808. The list of his works closes with his *Opere Sacre*, a series of treatises on spiritual subjects. Lanzi himself attached more importance to these than to any other of his writings, and was often heard to say that he would gladly renounce all kind of literary honours for the pleasure of being assured that his sacred works had in any degree promoted the cause of Christianity. Lanzi died of apoplexy, March 30, 1810, in the seventy-eighth year of his age. He was buried in the church of the Santa Croce at Florence, by the side of Michael Angelo.

LAOCOON, in *ancient mythology*, a Trojan hero, was a priest of Apollo, or, according to some, of Neptune. While the Trojans were hesitating whether they should convey into the city the wooden horse which the Greeks had left at their pretended departure, Laocoon urged them to destroy it, and, at the same time, pierced its side with his lance. The horse had been consecrated to Minerva, who punished the sacrilege. Soon after, when Laocoon was sacrificing a bullock to Neptune on the shore, two enormous ser-

pents issued from the sea, and attacked his two sons, standing beside the altar. The father, rushing to their aid, was likewise involved in their coils, and all three perished. This story, so often sung by ancient poets, is interesting to us, chiefly from being the subject of a magnificent piece of sculpture, which was found, in 1506, among the ruins of the palace of Titus, was bought by Pope Julius II., and placed in the Vatican. It represents three persons (of whom the middle one, Laocoon, is the tallest) struggling in the folds of two monster serpents, and with intense agony visible in all parts of their bodies. According to Pliny, with whose description it has been identified, it is the work of three Rhodian sculptors, Agesander, Polydorus, and Athenodorus, and stood in the palace of Titus. He also supposes it to have been made out of one stone, but minute examination can discover five pieces, artfully joined together. The right arm of Laocoon, which was wanting when the group was dug up, has been skilfully replaced. The date of the work is not fixed. Lessing places it in the reign of Titus, and Winckelmann in the time of Lysippus and Alexander. This group has been made the subject of an essay by Lessing, and has been described by Heyne and others.

LAODICEA, a name common to four places,—one in the western part of Phrygia, on the borders of Lydia; a second in the eastern part of the same country, denominated Laodicea Combusta; a third on the coast of Syria, called Laodicea ad Mare, and serving as the port of Aleppo; and a fourth in the same country, called Laodicea ad Libanum, from its proximity to that mountain. The first-named, lying on the confines of Phrygia and Lydia, about 40 miles E. of Ephesus, is the Laodicea of Scripture.

Laodicea was the capital of Greater Phrygia, and is supposed to have received its name from Laodice, wife of Antiochus Theos. Before this time it had been called Diospolis and Rhoas. It was a very considerable city at the time it was named in Scripture (Strabo, p. 578); but the frequency of earthquakes, to which this district has always been liable, demolished, some ages after, great part of the city, destroyed many of the inhabitants, and eventually obliged the remainder to abandon the spot altogether. Smith, in his *Journey to the Seven Churches* (1671), was the first to describe the site of Laodicea. He was followed by Chandler and Pococke; and the locality has, within the present century, been visited by Mr Hartley, Mr Arundell, and Colonel Leake.

Laodicea is now a deserted place, called by the Turks Eski-hissar (*old castle*), a Turkish word equivalent to *Paleókastro*, which the Greeks so frequently apply to ancient sites. From its ruins, Laodicea seems to have been situated upon six or seven hills, taking up a large extent of ground. To the N. and N.E. runs the River Lycus, about a mile and a half distant; but nearer it is watered by two small streams, the Asopus and Caprus, the one to the W., and the other to the S.E., both passing into the Lycus, which last flows into the Mæander (Smith, p. 85).

Laodicea preserves great remains of its importance as the residence of the Roman governors of Asia under the emperors.—namely, a stadium, in uncommon preservation; three theatres, one of which is 450 feet in diameter; and the ruins of several other buildings (*Antiq. of Ionia*, part ii., p. 32; Chandler's *Asia Minor*, c. 67). Colonel Leake says, "There are few ancient sites more likely than Laodicea to preserve many curious remains of antiquity beneath the surface of the soil; its opulence, and the earthquakes to which it was subject, rendering it probable that valuable works of art were often there buried beneath the ruins of the public and private edifices (Cicero, *Epist. ad Amic.*, ii. 17; iii. 5; v. 20. Tacit. *Annal.*, xiv. 27). And a similar remark, though in a lesser degree, perhaps, will apply to the other cities of the vale of the Mæander, as well as to some of

Laodicea.

Laodicea those situated to the N. of Mount Tmolus; for Strabo (pp. 579, 628, 630) informs us that Philadelphia, Sardis, and Magnesia of Sipylus, were, not less than Laodicea and the cities of the Mæander, as far as Apameia, at the sources of that river, subject to the same dreadful calamity" (*Geography of Asia Minor*, p. 253).

LAODICEA AD MARE. See **LATAKIA**.

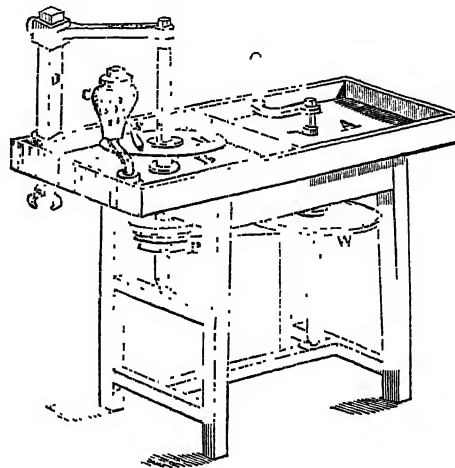
LAON (*Landunum*, or *Lugdunum clavatum*), a city of France, and capital of the department of Aisne, stands on an almost isolated hill, commanding an extensive view over the surrounding plain, 74 miles N.E. from Paris. The town is surrounded by old walls and ramparts. Among its public buildings are the noble cathedral of Notre Dame, built in the twelfth century, and surmounted by two square towers; the church of St Martin, and the Hotel de Prefecture, established in the ancient Abbey of St Jean. There are also the Hotel Dieu, a library containing 20,000 volumes, and a college. Corn and wine form the staples of its trade, and woollen cloths, blankets, hats, and worsted caps are its principal manufactures. Laon is the see of a bishop. Under the early French kings it was a place of note, and was the last possession of the Carolingian dynasty. In 1411 it was captured by the Duke of Burgundy; the English took it in 1419, and lost it in 1429. In 1594 it surrendered to Henry IV.; and in 1814 it was the scene of the defeat of the French under Marmont, by the allied army under Blücher. Pop. (1851) 8043.

LAOS, a country in S.E. Asia, extending from N. Lat. 15. to 24., and E. Long. 96. to 103., bounded N. by China, W. by the Birman Empire, E. by Cochín-China, and S. by Cochín-China and Siam. Little is known of this extensive country, or its inhabitants, by Europeans. Numerous mountain-chains traverse it from N. to S., forming an equal number of valleys, through which the rivers flow. These rivers (the principal of which are the Saluen, the Mackhaun, and the Menam), from their frequent overflowings, form extensive tracts in the plains. The soil, however, in these level tracts is fertile, produces rice, cotton, tea, and other fruits, and is covered in many parts by extensive and luxuriant forests. The mountains contain gold, silver, iron, and copper, and some tin and lead have also been discovered. Of wild animals, the tiger and the rhinoceros are the most numerous. The history of the people is very obscure. About the end of the eighteenth century they were subject to the Birmans. Since that time, although yielding a nominal submission to China, they have been gradually regaining their freedom, and are now under a number of small native governments. Though speaking the same language, the various tribes differ considerably in civilization and character. The divisions of Laos are three—Upper Laos, the northern; Lactho, the middle; and Lanchang, the south-eastern part. Kemalatain is the capital of the first; Zaenmae, or Changmai, the capital of the second; and Lanchang is said to be the capital of the third. A considerable commerce is carried on by the natives with China, Burmah, and Siam. They export cattle, fruits, precious stones, gold, silver, cotton, wool, lac, rhinoceros' horns, ivory, benzoin, hides, and tiger skins, salt, and silk stuffs. The chief articles imported are iron-ware, sandal-wood, chintzes, opium, musk, and chowry tails. They have a national literature, and are Buddhists in religion. Except for the purposes of trade, they have little communication with foreigners.

LAPIDARY, a name given to the artist or artisan whose business it is to cut, grind, and polish gems, small stones, &c., for the purposes of jewellery, and also for mineralogical specimens. The name, derived from *lapidarius*, pertaining to stones (from *lapis*, a stone), would seem to include the various modes of working or finishing stones in general; the technical use of the word, however, is limited as above noticed.

Minerals differ greatly in the physical property of *hardness*; and this is so marked a feature, that a scale has been formed in which certain well-known minerals are arranged as standards of comparison; they increase gradually in hardness from No. 1 in the scale, represented by talc, which is very easily cut, to No. 10, the diamond, which nothing will cut. No. 2 is compact gypsum, No. 3, calc-spar; No. 4, fluor-spar; No. 5, apatite; No. 6, felspar; No. 7, quartz; No. 8, topaz; No. 9, sapphire.

Stones are usually cut or polished by means of harder stones, in the form of powder, applied to the edge, or on the surface of certain disks of metal, wood, &c., revolving horizontally, on vertical axes, and called *mills*. The annexed figure represents the lapidary's bench, consisting of a stout



plank, supported on a frame. The top is formed into two unequal compartments, and a rim rises above it to prevent the dispersion of the waste emery and water. In the compartment A is a hole and collar, through which passes the vertical spindle of the driving-wheel W, which is about 18 inches in diameter, and is worked by the handle represented in A. In the compartment B is another vertical spindle, carrying the mill M, which is 8 or 9 inches in diameter, and also the pulley P, which causes it to revolve by its connection, by means of a cord, with W. D is a square wooden rod, supporting a horizontal iron arm, in which the top conical end of the spindle works. At C is an iron support, called a *gim-peg*, or *germ-peg*, the use of which is to support the arm of the workman in grinding the edges of small stones, and also as a guide for the vertical angle in cutting facets, for which purpose a wooden socket C is slipped over the upper part of the peg, and held by a wedge, while holes or notches in the side of the socket enable the operator to place at the proper angle the stick S, upon which is cemented the stone to be cut.

Diamond powder is preferred as the cutting material, even where sand or emery might be employed. It does its work far more rapidly than any other material; it lasts much longer, it can be used with very thin plates, which not only expedite the process, but waste much less of the material in the cutting than thick slicers. Diamond powder is prepared from *dort*, as diamond fragments are called, or from imperfect stones; they are crushed in a mortar of hard steel, a process rendered easy by the brittleness consequent on the crystalline structure of the diamond. If not made sufficiently fine by this means, the powder is mixed with oil of brick, placed on a flat piece of iron, and worked with another piece of iron as a muller.

The slicer is of planished iron, 8 or 9 inches in diameter, and $\frac{3}{16}$ th of an inch in thickness. The diamond powder is formed into a paste with oil of brick, and is applied to

Lapis-
Lazuli
||
Laplace.

the edge of the slicer with a piece of stick or a slitted quill, and the particles of diamond are pressed into the iron with a piece of agate or flint applied to the edge. This *seasoning*, as it is called, will last several hours. The stone to be cut is applied lightly to the edge of the slicer, which, to prevent heating, is made to revolve with moderate velocity by turning the handle, shown in A; the slicer during the cutting being well supplied with oil of brick.

The flat surfaces produced in the above arrangement, which is called a *slitting-mill*, are ground upon what is called a *roughing-mill*, which consists of a lead lap, charged with emery and water. It is polished in the *polishing-mill*, on a lead or pewter lap, supplied with rotten-stone and water.

When a stone is to be worked into a definite shape, a pattern is cut out in card, and this being laid upon the stone, the outline is marked with ink. The stone is then roughly worked into shape by means of flat nippers of soft iron. The stone is then cemented to a stick, and the exposed portion is ground by holding the stick upon a flat mill, and imparting to the stone certain peculiar motions, which are well understood by working lapidaries, who produce rounded, elliptical, and other faces and edges, with surprising accuracy. The numerous forms of facetting are performed with the assistance of the gim-peg, as already explained.

Diamonds are, for the most part, cut at Amsterdam, where the steam-engine is used to give motion to the mills. (C. T.)

LAPIS-LAZULI. See MINERALOGY.

LAPITHES, in *Grecian mythology*, the son of Apollo and Stilbe, was the brother of Centaurus, and the husband of Orsinome, daughter of Euronymus. From him the descendants of his sons, Periphas and Phorbas, who dwelt among the mountains of Thessaly, were called the Lapithæ, and the name was afterwards extended to all the inhabitants of the country under their rule. The most notable event in their history was their quarrel with the Centaurs. See CENTAURI.

LAPLACE, PIERRE SIMON, MARQUIS DE, the greatest of recent physicists, was born March 23, 1749, at Beaumont, near Pont l'Évêque, in Lower Normandy. His father, a small farmer in the Vallée d'Auge, was too poor to send him to school, but some rich friends took an interest in the young scholar and sent him to the college of Caen, and afterwards to the military school of Beaumont. Though mathematics were at this time his favourite study, he seems to have paid a good deal of attention to theology. In his eighteenth year he went to Paris, furnished with introductions to D'Alembert and others. D'Alembert took no notice of his letter, till Laplace sent him an essay involving some of the higher principles of mathematics, when he invited him to his house, and shortly afterwards procured him a mathematical mastership in the military school of Paris. Laplace soon justified his choice by his papers read before the Academy of Sciences, of which, in 1773, he became an associate, and in 1785 a member. Before he was thirty years of age he had begun that career of discovery which only terminated with his life. It is not necessary here to recapitulate the details of his studies and their results, which are given in full in the PRELIMINARY DISSERTATIONS of Sir John Leslie and Professor J. D. Forbes. When the Revolution broke out, Laplace became ambitious of political distinction. In 1796 he was one of the deputation which, in presence of the Council of Five Hundred, swore eternal hatred against royalty. A little later he dedicated to this same body his *Exposition du Système du Monde*. On the return of General Bonaparte from his campaigns in Italy, Laplace paid his court to him and secured his admission into the Institute. His good will was rewarded at a later period with the portfolio of the interior. But, as Napoleon afterwards said, "he carried into government the principles of

the calculus," and managed matters so ill, that after six weeks of office it was found necessary to promote him to a sinecure in the senate. This occurred in 1799. Four years later he was made successively vice-president and chancellor of that body. Though he had sworn eternal hatred against kings and tyrants, he cheerfully took the oath of allegiance to Napoleon when he mounted the throne in 1804. His complaisance was rewarded with numerous honours. He received the grand-cordon of the Legion of Honour in 1805, the title of count in 1806, the cross of grand-officier of the Legion of Honour in 1813, with many other distinctions. Yet when his benefactor's power began to wane, Laplace was among the first who voted for the overthrow of the imperial throne, and the restoration of the Bourbons. He even displayed a spirit of pusillanimous ingratitude to his fallen patron. He had dedicated to him, in very fulsome terms, his *Théorie des Probabilités*; in 1814, on the downfall of the empire, he suppressed this dedication. Shame or remorse for this time-serving may perhaps have prevented him from visiting the Tuileries during the Hundred Days. It is all the more creditable to him, however, that he did not go, as he had been assured of a kindly welcome. He carried a somewhat similar spirit into his writings, in which he withheld nearly all mention of any who had preceded him in his own branch of science, though liberal enough of praise to the great names in other departments of inquiry. On this point, however, it is unnecessary to dwell, as it has been already discussed in Professor Forbes' DISSERTATION. In 1816 Laplace was named by Louis XVIII. president of a commission for the reorganization of the Polytechnic School, and in the following year became president of the Academy of Sciences. Before this date he had been elected a member of all the leading learned societies of Europe. At the time of his death, March 5, 1827, exactly a century after that of Newton, he had nearly completed his 78th year. The last words he was heard to utter were, "Ce que nous savons est peu de choses; ce que nous ignorons est immense."

Laplace.

The following list of Laplace's works is taken chiefly from *La France Littéraire*, by M. Quérard, and includes not only his separate publications, but also numerous memoirs, with which, during a period extending to rather more than half a century, he enriched the collections of the Academy and the Institute, and the Journal of the Polytechnic School:—

1. *Essai Philosophique sur les Probabilités*, Paris, 1814, in 4to. Another edition of this work was published the same year in 8vo, and the work was reprinted in 1816, 1819, and 1825. The *Essai Philosophique* is merely an abstract of the large work on the same subject.

2. *Exposition du Système du Monde*, in five books, the fifth edition, revised and augmented by the author, Paris, 1824, in 4to, and in two vols. 8vo. The first edition of this work appeared in 1796, in two vols. 8vo. In five books the author treats, 1st, of the apparent motions of the heavenly bodies; 2d, of the real motions of those bodies; 3d, of the laws of their motions; and, 4th, of the theory of universal gravitation. The fifth book contains an abridgment of the history of astronomy.

3. *Précis de l'Histoire de l'Astronomie*, Paris, 1821, in 8vo. This is merely the fifth book of the fifth edition of the *Exposition du Système du Monde*, published separately.

4. *Théorie Analytique des Probabilités*, third edition, revised and augmented by the author. The first edition of this work appeared in 1812, in 4to. From 1816 to 1825, M. de Laplace published four supplements, which the publisher, after having sold them for some years separately, added to the volume to which they now serve as a complement. These supplements treat, 1st, of the application of the calculus of probabilities to natural philosophy; 2d, of the application of the calculus of probabilities to geodesical operations; and, 3d, of the application of geodesical formulæ of probability to the meridian of France. The fourth contains an abridgment of the theory of probabilities.

5. *Théorie des Attractions Sphéroïdes, et de la Figure des Planètes*, Paris, 1785, in 4to. This is a memoir extracted from the collection of the Academy of Sciences.

6. *Théorie du Mouvement et de la Figure elliptique des Planètes*, Paris, 1784, in 4to. This work was printed at the expense of Pre-

Laplace. sident Bochart de Saron, who only caused 200 copies to be struck off. for the purpose of being distributed gratuitously.

7. *Traité de Mécanique Céleste*, in sixteen books, Paris, 1799–1825, in five volumes 4to, with four supplements published at different times. The first book treats of the general laws of the equilibrium of motion; the second, of the law of universal gravitation, and the motion of the centres of gravity of the heavenly bodies; the third, of the figure of the heavenly bodies; the fourth, of the oscillations of the sea and the atmosphere; the fifth, of the motions of the heavenly bodies around their proper centres of gravity; the sixth, of the theory of the planetary motions; the seventh, of the theory of the moon; the eighth, of the theory of the satellites of Jupiter, Saturn, and Uranus; the ninth, of the theory of comets; the tenth, on different points relative to the system of the world; the eleventh, on the figure and rotation of the earth; the twelfth, on the attraction and repulsion of spheres, and the laws of the equilibrium and motion of elastic fluids; the thirteenth, on the oscillation of the fluids which cover the planets; the fourteenth, on the motions of the heavenly bodies around their centres of gravity; the fifteenth, on the motions of the planets and comets; and the sixteenth, on the motions of the satellites. A second edition of the first two volumes of this work was published at Paris in 1829, 1830. In this country no attempt has yet been made, so far as we know, to translate the *Traité de Mécanique Céleste* into English; but, in 1830, an English translation of the first volume, with a commentary, was published at Boston, in the United States of America. Both the translation and the commentary are by Dr Bowditch of Boston; but the amount of the latter is out of all proportion to the text, being intended to enable persons but moderately skilled in the mathematics to comprehend the profound analytical investigations of the great astronomer, and to follow him to his beautiful and striking results.

8. Besides the works which we have just enumerated, M. de Laplace is also the author of a series of very important Memoirs, in which, from 1772 to 1823, he published the collections of the old and the new Academy of Sciences, that of the Institute, and the Journal of the Polytechnic School. The subjects of these Memoirs are exceedingly various. We give the following list in the chronological order of their impression, viz.:—1. On the Particular Solutions of Differential Equations, and on the Secular Inequalities of the Planets, 1772; 2. On the Integral Calculus, and on the System of the World, 1772; 3. On the Integral Calculus of Partial Differences, 1773; 4. On recurring Series, and their Uses in the Theory of Chances, 1774; 5. On the Probability of Causes afforded by Events, 1774; 6. On some Points in the System of the World, 1775 and 1776; 7. On the Integration of Differential Equations with Finite Differences, 1776; 8. On the Mean Inclination of the Orbits of Comets, id.; 9. On the Use of the Calculus of Partial Differences in the Theory of recurring Series, 1777; 10. On the Precession of the Equinoxes, id.; 11. On the Integration of Differential Equations by Approximation, id.; 12. On Probabilities, 1778; 13. On Series, 1779; 14. On the Determination of the Orbits of Comets, id.; 15. On Heat, id.; 16. On the Electricity which Bodies absorb when reduced to Vapour, 1781; 17. On the Approximations of Formulæ which are functions of very great numbers, 1782, 1783; 18. On the Figure of the Earth, 1783; 19. On the Births, Marriages, and Deaths at Paris from 1772 to 1784; 20. On the Population of France, and the Number of Inhabitants in the Country, 1783–1788; 21. On the Secular Inequalities of the Planets and of the Satellites, 1784; 22. Theory of Jupiter and of Saturn, 1787; 23. On the Secular Equation of the Moon, 1786; 24. On the Theory of Saturn's Ring, 1787; 25. On the Secular Variations in the Orbits of the Planets, id.; 26. Theory of the Satellites of Jupiter, 1788, 1789; 27. On the Theory of the Satellites of Jupiter, 1789; 28. On the Flux and Reflux of the Sea, 1790; 29. On the Determination of a Plane which remains always parallel to itself, in the movement of a system of bodies acting upon each other in any manner whatsoever, and free from all foreign action, 1798; 30. On Mechanics, id.; 31. On the Motions of the Heavenly Bodies round their Centres of Gravity, id.; 32. On the Secular Equations of the Motions of the Moon, of her Apogee, and of her Nodes, 1799; 33. On the Motion of the orbits of the Satellites of Saturn and Uranus, 1801; 34. On the Theory of the Moon, id.; 35. On Different Points of Analysis, 1809; 36. On the Motion of Light in Diaphanous Media, id.; 37. On the Approximations of the Formulæ which are functions of very great numbers, and on their application to Probabilities, id.; 38. On the Figure of the Earth, 1817; 39. On the Flux and Reflux of the Sea, 1818; 40. Addition to the Memoir on the Figure of the Earth, id.; 41. On the Developments of the true Anomaly, and of the Elliptical Radius Vector, in series, arranged according to the powers of the eccentricity, 1823. Lastly, the Marquis de Laplace contributed, in the mathematical department, to the *Leçons de l'École Normale*.

(See *Eloge Historique de M. le Marquis de Laplace*, by Baron VOL. XIII.

Fourier, in the *Mémoires de l'Académie Royal des Sciences de l'Institut de la France*, tom. x., p. lxxxii.; Quérard, *La France Littéraire*, art. LAPLACE; *Revue Encyclopédique*, tom. xxxiii., p. 880; *Edinburgh Review*, vol. xi., p. 249, et seqq., vol. xv., p. 396, et seqq., and vol. xxiii., p. 320, containing masterly criticisms on the *Mécanique Céleste*, the *Exposition du Système du Monde*, and the *Essai Philosophique sur les Probabilités*; and Dissertations Fourth and Sixth, prefixed to the present work.) (J. B.—E.)

Lapland.

LAPLAND, the most northerly country of Europe, is bounded N. by the Arctic Ocean, S. by Sweden, E. by the White Sea, and W. by Norway and the Atlantic Ocean. Its limits are not very accurately laid down by geographers; but it seems to be divided from the rest of Scandinavia by a line nearly corresponding with the polar circle, in latitude 66. 32., and is consequently almost entirely an arctic region. North Cape, its most northerly point, is situated in N. Lat. 71. 10. 15., consequently its length from N. to S. is about 330 miles. and not 500, as is usually stated. From Cape Orlov, on the White Sea, to the Atlantic on the W., it extends about 700 miles; but besides this continental territory, there are a vast number of islands, which are included in the general name of Lapland. The whole country is divided into three parts, called Russian, Swedish, and Norwegian Lapland or Finmark, and is recognised by the Swedes and Norwegians by the name of Lapmark, *mark* signifying, both in Swedish and Norse, land or tract of country. The very early writers, however, do not notice any country under the name of Lapmark, whilst Finmark is alluded to, though not with such clearness as would admit of our defining the exact extent of country which went by that appellation. It has been conjectured that, in former ages, the parts of the north now known by the names of Swedish and Russian Lapland were distinguished as Russian and Swedish Finmark previously to the period when the Finns obtained the name of Lapper, or Laplanders. Throughout Norway and Finmark they are uniformly termed Finns, which was their ancient and most proper designation; it is only in Sweden, and Swedish and Russian Lapland, that the name of Lap is given to the inhabitants of the country. They were called Lappes by Laxo in the twelfth century; but still the etymology of the word is thus very obscure, though circumstances seem to favour the supposition that the term Lap was applied to this race of people by their neighbours the Swedes, and hence was transferred to the country which they inhabited. In the old Russian annals they are always styled Lepori, a word most probably of Finnic origin. Finmark, which forms the most northern part of this wild and extensive territory, constitutes one extremity of the kingdom of Norway, to which it now belongs, though doubtless in ancient times it was a separate kingdom, governed by its own sovereigns. Its present boundary on the W. is Loppen, the first island in Finmark, and which forms a line between it and the Nordlands, a part of Norway sometimes erroneously confounded with Lapland. On the N.W. and N.E. it is washed by the Polar Ocean, whilst to the E. it is bordered by Russian Lapland, which also, with Nordland, bounds it to the S.; the boundary line between the two countries being the River Tana. Its extent from N. to S.,—that is, from the borders of Russian Lapland to the North Cape,—is nearly three degrees of latitude; its greatest breadth being from W. to E., namely, from the western side of Faroe to the coast above Waranger, near the borders of Russian Lapland. At the eastern extremity of Finmark there is a considerable tract, to which both Norway and Russia lay claim. It lies between the acknowledged boundaries of each of these powers, and being now considered as neutral ground, is free to the Laplander of both countries to hunt and fish in. This district extends a little to the westward of Bugefiord, stretching nearly S. to the Enara Lake, where it bends to the E., and afterwards to the N.E., where it joins the coast. Russian Lapland lies to the S. and E. of the debateable ground above

Lapland. mentioned. The river Muonio, which for a considerable portion of its early course receives the name of the Kōngärnälf, constitutes the boundary between Sweden and Russia. The circle of Kola, and the northern part of Eastern Kemi, constituted at one time Russian Lapland; but, by subsequent treaties, two extensive districts, all the Lapmark of Western Kemi, and the greater part of the Lapmark of Torneo, have been ceded to Russia. Thus nearly two thirds of the regions inhabited by the Laplanders are included in the dominions of the emperor of Russia. Swedish Lapland, the most southerly division, occupies the interior part of the country to the west of the river Torneo; the maritime district of Nordland, a portion of Norway, being situated between it and the North Sea. How much of the northern part of Sweden is entitled to be called Swedish Lapland, it is impossible to say. If the arctic circle be taken as the boundary line, only that portion of Sweden called North Bothnia can be considered as belonging to Lapland; but Pitea Lapmark and Umea Lapmark are sometimes mentioned as forming part of the latter country, and these are situated in West Bothnia. The cause of error may be traced to the circumstance of these nomadic tribes frequently inhabiting, at least for a portion of the year, districts of country far down in the interior of Sweden and Norway. Thus, in the latter country, the Roraas Mountains, situated between Christiania and Drontheim, are inhabited, during summer at least, by a family of Laplanders, with the never-failing herd of rein-deer. But the exact boundary line is not very material, as it has reference only to different portions of a tract of country which is under one government.

Mountains.

Lapland is not intersected by alps or very high mountains, as is sometimes asserted; but, from Nordland onwards, the whole region is a table-land, crowned only on its western frontier with a mountainous chain, which forms the extremity of the Scandinavian Alps, and descends from Sulitelma, of which the elevation is 6200 feet, to the height of Norwegian Finmark. These are about 3600 feet high on the continental coast, and nearly 4000 on some islands. The sea-coast presents a remarkably bold and rugged, if not magnificent appearance. Mountain is seen piled on mountain in stern grandeur, and white with the snows of ages; and the sublimity of the scene is enhanced by the myriads of islands which are scattered in an extraordinary manner along the Norwegian and Lapland coast, as far as North Cape. Ravines and valleys intersect the interior; the elevation of the highest plains has been estimated at about sixteen hundred feet, but towards the east and the south they descend. Rocks and hills rise from the table-land, varying, to the east of 18° west longitude, from 2000 to 2400 feet above the level of the sea, but only from 500 to 600 feet above their base. These hills are rather isolated groups than a continuous chain; and at twenty leagues to the south of them the streams and rivers separate in different directions between the North Sea and the Bothnian Gulf, and between the Gulfs of Alten and Torneo. The central ridge is supposed to descend without interruption to the entrance of the White Sea, and that part of Lapland consists of extensive marshes, studded with rocks. These have been called the Koelin Mountains, and, strictly speaking, may be said to form one great chain; but the branches which it casts off to the right and to the left, the mountainous isles of Lofoden, which are merely the summits of some of its branches, and the mountains which terminate near Lake Enara in Russian Lapland, entitle it to the name of a group. Other ranges of hills, which traverse Lapland, and are connected with Finland, are lost round the numerous lakes in that country. Sulitelma, already mentioned, is the highest mountain in Lapland. The islands of Waag and Hurd have each heights rising 4264 feet above the level of the sea; and a glacier on the island of Seyland is 4155 feet high. The mineralogical structure of the

Lapland Mountains has not been thoroughly ascertained. Lapland. M. de Buch informs us that the hills which he examined on the higher part of the table-land are composed of granite and gneiss. The latter rock is said to be by far the most abundant in Scandinavia, all the other primitive rocks appearing in some degree subordinate to it. Quartz is very abundant on the island of Mageröe. On the Dovrefield, and other mountains, it is met with in scattered blocks; but at the North Cape the surface of the ground is wholly covered with it. M. de Buch also observed, in an excursion which he made towards the Gulf of Bothnia, a succession of calcareous and schistose rocks. These substances likewise abound in the country between the last-named gulf and that of Kandala. The land is intersected with ravines, but its elevation is inconsiderable. The whole region is supposed to rest on a base of red *decomposable* granite, or, as it is generally called by the natives, *rapakivi*. There is abundance of metal found in Lapland, particularly iron, of which whole mountains exist in that part of the country belonging to Sweden. Copper, lead, zinc, silver, and even traces of gold, have been found; but iron ore is the chief mineral treasure of the country, and might assist in introducing cultivation and an extensive trade into this desert portion of Europe, did not the scarcity of timber, and the great difficulty of conveying goods, constitute insuperable obstacles to the working of the mines in the inland and eastern parts of the country, where it would appear to be most abundant. The marshy lands are impregnated with this valuable metal, and in gneiss it occurs in beds which are sometimes nearly forty feet in thickness. Numerous minerals are found in Lapland; rock crystal in particular is very common, and the inhabitants occasionally dispose of it for amethysts and topazes.

There are numerous lakes and rivers in Lapland. Of Lakes, the latter, several take their rise in the Koelin Mountains, rivers. and flow in various directions into the Atlantic Ocean or the Gulf of Bothnia. The principal rivers of the country are the Tana or Tarna, which takes a north-eastern course through Finmark, and empties itself into a bay or sound of the same name; the Alten or Alata, which is very rapid, forcing its way through the mountains of Finmark in a north-westerly direction, empties itself into a bay of the same name; the Torneo, which issues from a lake so named, and, after being enlarged by a number of streams uniting in one channel and running nearly due south through a long course, falls into the northern extremity of the Bothnian Gulf at Torneo; and the Muonio, which rises from the Killpis Jaure, at the foot of the alpine chain of Norway, is a considerable stream, and constitutes the boundary line between Sweden and Russia, till it unites with the river Torneo, when the latter marks the limits of either country in this quarter. There are also other rivers which take their rise in Lapland, and fall into the Gulf of Bothnia, such as the Lulea, Pitea, Kalix, and others. In Russian Lapland there are several considerable streams, but these have not been so well defined, nor has this part of Lapland been so fully described, as the others. The Kemi takes its rise amongst the Kemi Mountains, situated near the centre of the country, and flows into the Gulf of Bothnia. It has many imposing cataracts, of which the *Taival Koski*, or the fall of the heavens, is the only one which the adventurous boatmen never attempt to cross. The *Passe*, or holy stream, is the outlet of the great lake Enara, flowing thence to the Arctic Ocean. The eastern declivities of Russian Lapland are watered by the Panoi, which discharges itself into the White Sea. The Tuloma falls from a great height, enters the lake Kola, which name it afterwards takes, and falls into Kola Bay, on the Arctic Ocean. Besides these, there are numerous other rivers which traverse the country in various directions, and either give rise to lakes, or issue from them. The abundance of

Lapland. lakes is the most prominent feature of Lapland, as it generally is of all countries situated in such latitudes. Sometimes these sheets of water occur singly, sometimes in chains, and many of them are of considerable size; but there exists such a confusion of nomenclature, that it is difficult to distinguish one from another, and apply to each its proper designation.¹ Very often the rivers, such as the Muonio, become so broad in some parts, as often to assume the appearance of lakes, and there is little doubt they have occasionally been so termed. The most considerable lakes are, the Enara, in Russian Lapland, which is about forty miles in length by sixteen in breadth; the Imandra, which has an elevation of four hundred feet above the level of the sea, and is discharged into the Gulf of Kandala; the Biggi Lobe, and Biggi Jaure, one or other of which, Sir Capel Brooke supposes, is that designated by Von Buch the Jess Jaure; and many others which do not require to be enumerated. Besides these inland bodies of water, the shores are indented by extensive *fjords* or arms of the sea, which frequently run thirty, or even forty miles into the heart of the country.

Vegeta-
tion.

Finmark and Swedish Lapland, including all the modern provinces belonging to Russia, have been carefully examined by Wahlenberg and Von Buch, and the vegetable kingdom distinguished into six zones, concentric with the Gulf of Bothnia, each differing from the others in climate and productions. The first or lower region of the forests rises from the level of the sea to the height of five hundred feet, forming a zone generally eighty miles in breadth; and here the spruce and Scotch fir abound. The second is higher and colder than the first, rising from five hundred to eight hundred feet, and being generally only from six to eight miles in breadth. This portion has been denominated the upper region of the forests, and here the Scotch fir is still found, but the other plants disappear. The third is higher than any of the preceding, rising from 800 to 1200 feet, and for the most part about twelve miles in breadth, excepting at one place, where this becomes very great. The fir here is rarely seen, but pines are abundant. The fourth or subalpine region, rising from 1200 to 1800 feet, is a zone of about the same dimensions as the preceding, and contains birch, but coniferous trees do not grow there. The fifth is called the alpine region, or the country of the dwarf birch; and the sixth, which is the highest and most northern of all, varies in breadth according as it is indented by the sea. It is the region of perpetual congelation and eternal snow, producing no trees, and scarcely any vegetation whatever. The vegetable scale in Norwegian Lapland has been marked by Von Buch. The following table is intended for seventy degrees of north latitude:—Limit of the red pines, 730 feet; of the birch, 1483; of the *vaccinium myrtillus*, 1908; of the dwarf birch, 2576; of the *salix myrsinites*, 2908; of the *salix lanata*, 3100; and of perpetual snow, 3300. The species of plants which constitute the *Flora Laponica* are not numerous, but they abound in individuals, and the vegetation here is decidedly superior to that of the other countries round the Frozen Ocean. Mosses and lichens cover the plains and rocks which are elevated more than a thousand feet; and were the inhabitants more industrious, these might be rendered useful as dye-stuffs. The rein-deer's lichen is of a bright yellow colour, which, however, is fugitive, the yellow giving place to white as the plant dries or withers. The mosses

and lichens constitute the food of the cattle, and from a species of the latter a wholesome and nutritious flour is extracted. The rocky country is the region of these cryptogamia. The *rubus chamaemorus*, and the *vaccinium myrtillus*, occur in the neighbourhood of the extensive marshes; but reeds or aquatic plants are found on the banks of lakes or rivers. A plain surrounded by rocks, and covered with moss and other alpine herbage, forms a Lapland meadow. Rein-deer moss is quite indispensable to the Laplander's herd. It is hardly to be met with on the Finmark coast, but on the continent it is found in abundance, though not so plentifully as in the interior parts. It thrives best in a flat extent of low ground, consisting of morass or forest well saturated with moisture. On this account Finmark, which is rocky and mountainous, does not abound so greatly in this moss as the level plains and morasses of Russian Lapland, where it grows in the greatest profusion, immense tracts of country being wholly covered with it. Of trees, twenty-six kinds have been enumerated, including the *salices*. There are no less than nineteen species of willows; the others consist of Scotch and spruce fir, birch, alder, poplar, mountain ash, and bird cherry. Apples, pears, plums, and cherries, scarcely grow at all, although carefully cultivated; but considerable varieties of berries are spontaneously produced, amongst which are black currants, and raspberries of an exquisite fragrance. It may be stated, that in Swedish Lapland the vegetable productions bear a nearer resemblance to those of Siberia than the plants of the western part of Lapland, which, towards the sea, are analogous to those of Scotland and Iceland. The most abundant indigenous vegetables are the sorrel, which is prized on account of its antiscorbutic properties; the angelica, a highly-relished article of food; and the *lichen rangiferinus*, the staple of the rein-deer during winter. Towards the south are gardens in which the vegetables of the temperate zone are cultivated; and various flowers, including roses, carnations, and the like, also adorn these enclosures. Potatoes reach the size of poppy-heads (those of Finmark are very sweet, and of a waxy consistency); French beans, broad beans, and tobacco, where care is taken with it, are raised, but neither peas nor white cabbage come to perfection.

With respect to the climate and vegetable productions of Alten, Sir Arthur de Capel Brooke observes, "in speaking of its horticulture, it might be supposed that the produce of a country under the latitude of 70° would be extremely scanty. This, however, is not the case. Most kinds of vegetables succeed perfectly well, and are cultivated in sufficient abundance for the wants of the inhabitants." This traveller then proceeds to mention the cultivation of the potato, which is raised to some extent in Finmark.

Most of the wild animals common to Norway and Sweden are found in Lapland. Bears are numerous; and though the rein-deer evades destruction by the rapidity of its flight, yet cows, goats, and sheep frequently fall victims to their rapacity. These animals are extremely partial to a certain kind of berry which is abundant in the country; but they likewise feed on grass. Wolves and foxes are plentiful, and the former are likewise very destructive to the tame animals; the skins of the latter are much prized in the north of Europe. The glutton, which is strongly furnished with teeth, as well as very sharp

Lapland.

Animals.

¹ Much confusion exists regarding the names of places and things in Lapland, and every writer must experience difficulty and be exposed to error in describing any portion or feature of that country or its inhabitants. Mountains, lakes, and rivers have frequently, indeed in almost every instance, more than a single appellation assigned to them; so that what is called by one name in any given work, will be found described under another designation in every other. This is particularly the case with regard to rivers, which, from their source to the sea, sometimes change their names two or three times.

Lapland. nails, is common; and its skin, on account of a white shining streak with which the neck is marked, is held in great estimation. In the woods the glutton frequently surprises the rein-deer, by suddenly descending upon it from the branch of a tree, and killing it by mangling the neck with its teeth. Otters of different kinds, ermines, a species of white weasel, squirrels whose skins are beautiful and much valued, the *mus lemmis*, a species of marmot peculiar to the country, and field-mice in vast numbers, are all natives of these high latitudes. The beaver is found in some parts, but seldom on the rivers. The wool and the skin of this animal are marketable commodities. Hares are bred in great numbers; and they are distinguished by the striking peculiarity of changing their colour from gray to white during winter. Coverlets are made from their skins. There are three species of martens found; the *steen-maar*, which inhabits the rocks; the *birfe-maar*, which makes the birch-tree thicket its home; and the *furr-maar*, which haunts the fir-trees. There are said to be a few elks, but of wild rein-deer the number is very great. From these to the individuals of the race which have been domesticated, the transition is natural. The most valuable part of a Laplander's possessions, and the chief object of his care, is the rein-deer. It unites in itself the best qualities of almost every other animal which has been found essential to the comfort of man in other countries to which it is a stranger, being at once the horse, the cow, the sheep, and the stag of Lapland. Its milk is so rich as to require being diluted before it is used. Its flesh is superior to that of the sheep; and, from its tractability and natural power of endurance, it drags the sledge of the Laplander with extraordinary speed and perfect safety over the desolate and chilling regions of snow which he inhabits. It is, moreover, easily maintained, finding its food, the favourite moss which goes by its name, amongst the frozen wastes during winter with perfect ease. These animals are also said to feed on frogs, snakes, and mountain-rats, and to be very partial to human urine, which they lick up with avidity whenever it comes within their reach. But the possession of this invaluable quadruped is very uncertain, for the wandering herds sometimes disperse themselves in the woods, from which it is difficult for the shepherd to dislodge them. They are, besides, not easily milked, and yield but a small quantity at a time, so that a large flock is necessary before the head of a family can be supplied with a sufficiency of food and milk. In shape they resemble stags; and their hair, at first gray, becomes blanched before it falls off. They cast their horns annually; those of the male are often two feet and a half in length, and their points are frequently as far asunder. They are generally four feet in height from the foot to the top of the back; and the length from the shoulder to the tail is two feet. A crackling noise is heard when they walk, which is asserted by some writers to result from the hoofs striking together when the foot is raised, but there are other opinions upon this subject.

The rein-deer is subject to various diseases from which other animals appear to be exempt, and during summer they are attacked by the *æstrus tarandi*, a large kind of bee, whose eggs, deposited in the skin, produce ulcerations not unfrequently destructive to the fawns. This great enemy of the rein-deer will pursue it for many miles; and in hot weather the Laplander takes a journey of some hundred miles to the sea-coast, principally for the purpose of avoiding its attacks. The *æstrus nasalis*, another tormentor of the rein-deer, makes small punctures within the nostrils, and there deposits its eggs. It is a singular fact, observed by Sir Arthur de Capel Brooke, that the rein-deer increases in size the farther north it is found. Cows, sheep, goats, and horses, have been naturalized in Lapland; but the management of these animals,

together with other particulars regarding the rein-deer, **Lapland.** we will afterwards have occasion to recur to.

Of birds there are many found in Lapland which are **Birds.** unknown in other countries, such as the Lapland woodcock, the Swedish mock-bird or nightingale, called, from its melodious notes, "the bird of an hundred tunes," together with a peculiar species of the owl, magpie, woodpecker, woodcock, and others of the feathered races. Flocks of birds of passage resort to Lapland during summer for the purpose of breeding, amongst which may be enumerated the eagle and falcon tribe, owls larger than common, and occasionally white, crows or rooks in great numbers, ravens, partridges, large bustards, magpies, pigeons, plovers, ptarmigans, swans, wild geese, eider ducks, cocks of the wood, varieties of grouse, curlews, and various other feathered frequenters of the field or lake. Only a very few species of birds remain during winter, there being little subsistence for them in such chilly wastes of snow and ice. Common frogs and lizards are the only amphibious animals found. No venomous animal is to be met with in Lapland, but insects are in hot weather as numerous and annoying as in tropical climates. Besides the two already mentioned, the interior forests of Lapland swarm with gnats, which attack both man and beast with the greatest fury. The rivers abound in excellent salmon, and the lakes in perch, pike, trout, char, and other fish. The seas are also well replenished with the finny tribes, such as cod, tusk, and ling; and whales, particularly that species called the fin whale, so difficult to be captured, abound upon the Lapland coast. These enormous animals are very plentiful about Cape North; and Sir Arthur Capel Brooke was informed by the Laplanders that they are extremely partial to cows and horses, and will pursue a boat in which these are until they are landed.

The climate of Lapland is of course very cold, but it **Climate.** is milder than that of any other region on the same parallel, the coasts of Siberia, for instance. The temperature of the air is regulated by the height above the level of the sea, and the distance from the Gulf of Bothnia, and may be divided into two regions, the inland and the maritime. It may be laid down as a principle which generally holds true, that in the former the winter is severe and the summer hot, whilst in the latter the winter is comparatively mild and the summer cold. An open and ever agitated sea is one great cause of the mildness of temperature which is experienced on the northern coasts of Finmark; but the maritime climate is much colder on the other side of Cape North, and the harbours on the coast of Eastern Lapland are sometimes blocked up in the middle of June. In the inland parts the summer is short; but in the sixty-six days during which there is no night, the crops are sown, ripened, and reaped. At this time the enlivening songs of birds are heard, and the earth is in some places covered with flowers. There is no darkness, and the coolness of evening is never felt. The heat is thus very oppressive, particularly in confined places, such as valleys. At this time insects are exceedingly troublesome. Acerbi, a traveller in Sweden and Lapland, found the degree of heat fifty-two of Fahrenheit in the shade, and eighty-one in the sun. The ground was so hot as to give uneasiness to the feet, whilst it oppressed the lungs; and the shrubs which were met with at distant intervals afforded little or no shelter to the traveller. In various parts of Lapland the days during summer are in brightness, geniality, and serenity, equal to those of more propitious latitudes, and both delightful and healthy. Von Buch found the mean temperature of the month of July nearly sixty-three degrees at Altengaard, in north latitude sixty-nine degrees. In winter the cold is so excessive, that mercury, and even brandy, frequently freeze

Lapland. in the open air. All the lakes and rivers are covered with ice of great thickness, and the whole face of nature is buried beneath a sheet of snow several feet in depth. During the winter solstice the sun continues seven consecutive weeks below the horizon, when only a partial twilight prevails; but this "darkness visible" is to a considerable extent compensated by the superior brightness of the moon and stars, and the vivid beams of the aurora borealis, the light of all these luminaries being augmented by the whiteness of the snow, which keeps up a perpetual reflection from the earth's surface. Thunder storms sometimes occur during the depth of winter. When a thaw comes on, the atmosphere is filled with vapours; but during the prevalence of the north wind the air is clear and the sky is serene.

Vegetation depending more upon the heat of summer than the cold of winter, Enontekis is superior to the North Cape in bringing the productions of the ground to maturity, notwithstanding that the mean temperature is lower, because the heat during the summer is higher at the former than at the latter place. The covering of snow here also, as elsewhere, serves to retain the heat which the earth has imbibed during the warmer months, and preserves it in a better state for vegetation. At Enontekis the snow continues on the ground from October till May, whilst at the North Cape, being open to the sea-breezes, it is exposed to frequent thaws; nor is it likely, under such circumstances, it can ever lie so deep. On some of the inland elevations, particularly in Finmark, if the summer be very cold, it lies during the whole year, and entirely prevents vegetation from making its appearance, with the exception of some of the *cryptogamia*.

Agriculture.

The soil of Lapland is generally sterile. The greater part of the country is covered with rocks or moss, or gravelly plains, or a kind of turf composed of mosses decayed by the frost, and impregnated with standing water. There are a few tracts of tolerable soil, especially in the more southern districts. The agriculture of Lapland is hence very trifling, for the soil yields but a very inadequate return for the labour which the hardy native bestows upon it; and in general he finds a more ready means of supplying himself with what he requires, by barter with the Russians. The following quotation, however, from Sir Arthur de Capel Brooke, presents a more favourable view of the climate and its productions than might have been anticipated. After mentioning the culture of the potato, already alluded to, and which is likely to be very beneficial to the country, as rendering it less dependent upon Russia for a supply of bread corn, he proceeds: "To this it may be added, that barley and rye are cultivated to some extent in parts of Finmark, particularly at Alten, although no agriculture is carried farther north; and this circumstance alone would induce us to form no unfavourable opinion of the climate of a place situated near four degrees beyond the polar circle. The Scotch fir, too, reaches Talvig in seventy degrees; and the *moltebær* (*rubus chamæmorus*) flourishes to the very verge of the North Cape, in 71. 10. 15. where the winter night is ten weeks in length."

Origin of races.

Much obscurity veils the origin and early history of the inhabitants of Lapland. The Samoyedes, Esquimaux, Greenlanders, and Laplanders, appear to have been originally the same people. The more immediate ancestors of the latter were probably the ancient Finns, for the description which Ptolemy and Tacitus give of the Finni exactly corresponds to that of the highland Laplanders of the present day. There is also a race of people inhabiting Finmark, quite distinct from the Laplanders, called the Quäns.

Professor James D. Forbes, who visited Finmark in 1851, thus speaks of the Quäns:—"A stranger has some diffi-

culty to understand their relation to the Laplanders, with whom they are easily confounded, both being often called Finns. It is, indeed, in Finmark itself that the Lapps are most frequently, but inaccurately described as Finns. The Quäns, however (who, like the Lapps, are foreigners), properly come from Finland, whilst the Lapps belong principally to the opposite or western side of the Gulf of Bothnia. Their appearance (excepting, however, their dress), their habits, and even their language, are essentially distinct; the Lapp is dwarfish in the extreme, and the form of the countenance resembles that of the Tartar tribes. The Quän, or Finlander, or Esthonian, with some features in common, is moderately tall, and has a skull more of the usual European type. Their habits are absolutely diverse: the Quän being domestic and fond of agriculture, the Lapp essentially nomadic and incapable of steady labour; so much is this the case, that some writers consider the distinction as referring rather to occupation than to race. Of the capacity of the Quäns some difference of opinion exists. Von Buch considers them to have done much more for Finmark than the Norwegians themselves, and that they are even now its most civilized inhabitants, and by far its best agriculturists. The report of the Alden Company's officers is less favourable; but it is quite possible that mining industry is unsuited to their tastes and habits. The language differs as much from the Lappish as Swedish does from the German. Though their costume is similar, their houses, substantially built of logs, are roomy, comfortable, and of course permanent, unlike the Lapps. The appearance of the Quäns in Norway is believed not to date earlier than the commencement of the last century. They are stated by Von Buch to have been driven out of their native country by the wars of Charles XII."

The Finmark Laps have been divided into two classes, the fishing or Shore Laplanders, and the rein-deer or Highland Laplanders. From their different habits of life, there is a marked distinction between the two; and there is yet another class of poorer Laplanders, who are numerous in all parts of Swedish and Russian Lapland. These are called *Shogslapper*, or Wood Laps, dwelling almost entirely in the wooded parts of the country, their herds of deer being too small to enable them to live in the mountains. During summer they live in tents; in winter they construct sod-huts, resembling the *gammies* of the coast Laps.

This kind of Laplander is unknown in Finmark, the country being mountainous, and nearly destitute of forests. The mountain Laps of the latter country are for the most part wild and savage, both in appearance and habits. They exhibit a degree of haughtiness and proud independence of spirit, which is wanting in individuals of the race who inhabit the plains of Russian Lapland or the shores of the northern coast. Until softened by a present, they are surly and morose in disposition; and their suspiciousness of temper detracts much from any hospitality which is apparent in them. The stranger must therefore remove this natural mistrust of the Lap before he can expect to receive from him any attention; and brandy, above all things, is the most potent softener of his feelings. This, or a present of tobacco, is so efficacious as to render him quite a different person, and willing to perform any service to the donor.

The dress of the mountain Laplander of Finmark does not materially differ from that of the inhabitants of other parts of Lapland. In winter they are entirely clothed in rein-deer skins, consisting of a *pæsk*, or frock of rein-deer fur, or, what is more common, a *muadda* or sheep-skin garment. This is belted up by the leathern girdle (*buagan*), to which is suspended the knife, the tobacco pouch, and shooting apparatus when they follow the chase. The first is a long knife, not unlike that of a butcher, the handle of birch root, and the blade of great substance and strength.

Lapland.

character.
&c. of the
people.

Lapland. The driving *pæsk* is composed of the thickest and best skins his deer afford; and, as a further protection whilst travelling, a broad bear-skin tippet covers the shoulders, and reaches nearly as low as the elbows. The lower part of the dress consists of the *bællinger*, a sort of loose spatterdashies or leggins, which, being drawn over a pair of long, loose deer-skin pantaloons, reach from the ancles high up the thigh. These are whole, and fastened or tightened at the top by a running string, and covered over at the bottom by the *skallkomager*, or high rein-deer shoes, and the *komager baand*, which is a long, narrow band, going several times round the ancle, keeping the whole tight together, and preventing the possibility of any snow from getting in; for the upper parts of the *bællinger* are of course covered by the *pæsk*, which, when girded up, reaches just below the knees, but, when loose, falls down nearly to the ground. In summer, the heat of the weather compels them to make an alteration in their dress, and the rein-deer *pæsk* is exchanged for a round frock of wadmal cloth. This *gappe* or summer frock, which is generally made of the skins of young deer, extends below the knees. On the head is worn a small low cloth cap (*gappir*), turned up all round, with a facing of fine rein-deer fur. No shirt is worn next the skin, linen being a luxury with which the Laplanders are entirely unacquainted. The use of stockings is likewise unknown, but a substitute is found in the soft dried grass called *sena*, with which the shoes are well stuffed. The hands are protected by rein-deer gloves, or rather mittens, being without fingers, but stuffed with the same kind of grass as the shoes. Almost every part of the winter dress of the Laplander is thus furnished by the useful animal which is the companion of his wanderings. The *pæsk* is made from the whole hide of the deer killed during winter; the *bællinger* and gloves, of the skin covering the legs and thighs of the animal; and the shoes are taken from the skin between the horns, and covering the crown of the head. The fur is worn on the outside, and, from the peculiar closeness and thickness of its texture, it is impossible for the cold to penetrate it. Every part of a Laplander's dress is worn loose, and thus the blood is allowed to circulate freely, an advantage which could not be enjoyed were the clothes tight on the skin. The dress of the coast Laplander is entirely similar to that of the mountaineer, except that when the weather is not warm, he usually wears a sheep-skin garment called *muadda*; and the wool being next the skin, it is rendered nearly as warm as the rein-*pæsk*, though this also he commonly wears in winter. The former, however, being the produce of his own flock, and made up by himself, is naturally in more general use. The rein-deer skins are obtained by barter from the highland Laplanders, and being made into garments by the inhabitants of the coast, who are expert at this kind of work, are again sold or exchanged for silver money, or the necessities they may require. The women have some skill in embroidery, and collars and cuffs of the wadmal dresses, both male and female, exhibit their taste in the art of adorning. The dress of the females very much resembles that of the men. In winter a frock or *pæsk* of sheep-skin, worn with the woolly part inside, is bound to the waist by a belt, to which a small knife is suspended. In summer the sheep-skin frock is exchanged for one of wadmal cloth. The cap is sometimes made of various kinds of cloth, and it is usually encircled by a ribbon. The fondness of these people for anything gaudy is very conspicuous in their summer dress, for the necessities of winter compel them to keep it more unvaried. During the hot months the Lapland costume is very picturesque, from the variety of colours combined in it. It is then, particularly on the sabbath-day and on holidays, that he shows his pride, by making his appearance in all the finery that his means will afford. The usual colour of Lapland. his *koften* or daily frock is white, with several edgings of blue and red cloth round the bottom and cuffs, but his Sunday garment is of a more ornamental nature, and frequently of thin cloth, richly embroidered in party colours round the cuffs and collars. In some parts of Lapland *koften* of black cloth are met with, and those that are wealthy sometimes array themselves in scarlet ones. On extraordinary occasions, other parts of their dress are also of a finer nature than what is commonly worn. As may be supposed, even the best species of cloth which finds its way to these regions, is of a very inferior quality; it is chiefly of German manufacture, although cotton from England is also found here. Those of the women who can afford it, adorn their persons with rings, and ribbons of the gayest colours flutter around their bonnets. Like the Greenlanders, and other inhabitants of high latitudes, females wear pantaloons like the men, a practice which was in all probability had recourse to for personal comfort, in regions where open garments would have unnecessarily exposed the body to the cold. It may be mentioned, that the dresses of the families of the merchants who live on the coast are very superior, in point of elegance, to the garments of the native Laplanders.

The difference of character between the highland and coast Laplander has already been adverted to. The former is known by his haughty expression of countenance, and proud independence of demeanour. The more domestic habits of life of the coast Laplander, render him a more quiet and inoffensive being, and give to his features a milder and a somewhat vacant expression. Speaking of the Laplanders in general, they must be considered as a diminutive race, though not such pigmies as is commonly supposed. The Norwegian Laplander is superior in stature to the rest of the race, and this difference is probably to be attributed to the freer and purer air of his mountains rendering him more hardy and robust. The average height of the highland Laplander may be considered as varying from five feet to five feet two inches. They sometimes, but very rarely, exceed this stature. The characteristic features of the race are small elongated eyes, high cheek-bones, wide mouth, and a pointed chin, with little or no beard. Their hair is generally brown, or dark coloured. Their bodies, from their habits, are naturally spare, and devoid of corpulence, though in general they are ill made. They are bony and muscular, possessing greater strength than their stature would seem to indicate, active, and capable of enduring almost any fatigue. Their hands and feet are remarkably small; their voice is weak, and its tones have a squeaking effect upon the ear of a foreigner. In their moral character the Laplanders exhibit some marked peculiarities. Their passions partake of the torpor of the climate, and flow in a slow, cool, and regular course, unbroken by those sudden ebullitions and transports which characterize the men of warmer latitudes. Love, or the amatory feeling, is but a lingering spark, only sufficient to answer the purposes of nature. They possess in a remarkable degree the virtue of continency, and the conjugal relation is rarely or never violated, although both their parental and filial affections are weak. Anger and bloodthirstiness are unknown to them; and Sir A. Capel Brooke found, in 1823, that, during the space of twenty years, only one murder had been committed in Finmark. Although they are generally cautious, mistrustful, and suspicious, especially of strangers, as well as cunning in their commercial dealings, yet theft is almost unknown amongst them. The absence of this vice is proved by the fact, that locks, bolts, and other safe-guards, are considered as unnecessary appendages to a door. They have been accused of avarice, but without any just reason; for whatever strictness they may

Lapland. observe in bargain-making does not arise from a wish to hoard up money, but that they may be more bountifully supplied with their favourite beverage, brandy, of which they are excessively fond. Drunkenness is not only common, but may be said to constitute a feature of their character. In temper the coast Laplander is of a kinder nature than the mountaineer, and he is more inclined to hospitality, although this virtue is by no means very conspicuous in either. They are generally passive, without much courage, and altogether of a very peaceable and inoffensive disposition. They now exhibit little of a warlike spirit, although in former ages they were frequently the cause of terror to the Norwegians. Notwithstanding their ebriety, health is a blessing which the inhabitant of Lapland enjoys in a high degree. They were formerly addicted to degrading superstitions; and the witchcraft in particular which was exercised amongst them has passed into a proverb. Milton alludes to this circumstance when he speaks of dancing "with Lapland witches." They were famous for their empire over the winds, which they disposed of in bags to the credulous mariners. In performing their infernal rites, the instrument used was the magical drum, by beating which as an accompaniment to other ceremonies, they fancied they had the power of foretelling future events, curing diseases, and exorcising evil spirits. Their mythology was distinguished by an universal idolatry, in which the elements were typified, and a polytheism, by which every object in nature was changed into a god. But on these wild creations of the human mind in a state of ignorance and barbarism it is unnecessary to dwell. The rites by which the worship of their deities and idols were celebrated are now unknown, being supplanted by those which have their origin in the milder and purer genius of Christianity.

Habitations,

The habitations of the Laplanders now demand description. The mountaineers live in tents, which differ in no respect in summer and winter, and are of very simple construction. They are formed by six beams of wood rising in a pyramidal form, and meeting nearly at the top, covered with thick and coarse cloth, a flap of which, left loose between two of the beams, constitutes the door. The height of the tent is generally about six feet, and the whole circumference of the inside seldom exceeds fifteen or eighteen feet. The floor is strewed with rein-deer skins, having the hair upwards, and which thus serve for either lying or sitting on, the tent being too low to permit of the occupants assuming the erect posture, except in one place. A stone frame is made in the middle for the fire, and there is a hole at the top to which the smoke must find its way; but its speedy egress is by no means considered as necessary to comfort. The fumes thickly impregnate the whole tent, as well as "all which it inhabit;" a species of jappanning highly valued, as affording a protection in winter against the cold, and in summer against the swarms of musquitoes. Cabined and confined in this limited domicile, it is here that the Laplanders, seated on their heels in the manner of the eastern nations, or squat like toads, spend in all the beatitude of idleness the moments which they can spare from their pastoral avocations. The different provisions are kept in boxes attached to the stakes; and boxes are ranged on the inside round the cloth or covering; but these precautions are often unavailing against the impetuosity of the blast, whilst the thinness of the tent naturally exposes the inmates to the severity of the weather. In regard to habitation, the shore Laplanders have a decided superiority over those of the mountains. The gammie or hut of the former is usually about five feet in height. It is generally of a circular or oblong form, having the appearance of a large rounded hillock, which name it may be said to deserve, being composed of turf laid on branches of the birch, and supported underneath by a

wooden frame-work of stronger materials, to bear the weight of the whole. The entrance is by a low, narrow passage, at the extremity of which is the door communicating with the part inhabited. Around them are generally enclosures for the cattle, and several racks of coarse fodder for their winter food. The farming stock of the coast Laplander consists of a few sheep, and sometimes a cow or two, which are kept in the enclosure during the summer season, and in winter occupy the same buildings with their owner, being supported during the latter partly by the coarse fodder which he has been able to collect, but chiefly by the remnant of his fishing produce.

Necessity has rendered the highland Laplander a wanderer, and habit has made that mode of life a second nature to him. It is upon the rein-deer that he almost entirely, if not altogether, depends for subsistence; and hence their welfare is the chief object of his care, in promoting which he is compelled annually to take long journeys to the seashore for the purpose of avoiding the attacks of insects. His habits of life are thus in a great measure formed; and the year is divided between his abode on the mountains and his migrations to the coast, whilst his life as a whole consists of the extremes of bodily fatigue and total inaction, plenty and want. When he is hungry, and has the power of gratifying his appetite without restraint, he is perfectly ravenous, and devours a quantity sufficient to support him for several days. Those who inhabit high latitudes, where subsistence is precarious at certain seasons, seem all to have a remarkable capacity of stomach, and to be capable of eating an enormous quantity at a meal, so as to serve them for five or six days, without being annoyed by the load. The necessities of their situation have compelled them to practise this frequently, and custom has rendered it easy. The Laplander's household economy, it may readily be imagined, is simple in the extreme. His food during the period of his summer rambles is spare and frugal, and without any indulgence in rein-deer venison, his favourite food and the luxury of the winter season. In summer he is intent only on increasing the number of his flock, and on providing against his future wants. He contents himself then generally with milk, and the remains of the curd and whey after making his cheese. The first is taken sparingly, on account of the small quantity which a single deer yields, as well as of the great importance it is to him to secure a good quantity of cheese for his winter stock, and to guard against any disaster that might befall his herd and reduce him to want. As he milks his herd during the summer season only, when this approaches a close, some milk is generally preserved for the purpose of being frozen. This serves not only for his own individual use during the winter, but, being highly prized for its exquisite delicacy in this state, it constitutes an article of trade; and the merchants with whom the Laplander deals, and who then repair to the interior, gladly purchase it at any price. Though the rein-deer milk is thus of a very rich quality, yet the cheese made from it is extremely bad, and unpalatable to any one but a native. It is made by simply placing the milk in a large iron pot over the fire, which, with the addition of rennet made from the stomach of the deer, quickly coagulates. The curd is then pressed, and the whey, being separated from it, is put into shallow moulds of about the size of a small plate. Bad as it is, the hardy Laplander is very partial to it both raw and roasted; in the latter state it appears at the tables of the merchants, and is rather more eatable than when unprepared. When heated, an oily juice exudes from it, which is found of great use in removing the effects arising from being frost-bitten. Butter is seldom if ever made of rein-deer milk by the Laplanders, but it is so by the Finland settlers, who in many parts of Lapland keep herds of rein-deer, the colour of which, it is said, is peculiarly white. The Laplanders sometimes vary

Lapland.

Habits and modes of life.

Lapland. their dishes by mixing different kinds of wild berries with the whey, the latter being previously boiled till it acquires some degree of consistency. They are no less fond of the roots of the angelica, which has an agreeable taste, and likewise possesses antiscorbutic properties. Much value is set upon the blood of the rein-deer, from which a variety of dishes is prepared, care being always taken to preserve it when the animal is killed. It is also supposed to possess antiscorbutic properties. Those who reside upon the coast subsist chiefly on fish, with a little beef and mutton occasionally. The furniture consists of horn spoons, pots and kettles made of brass or copper, and sometimes of stone, wooden bowls capable of holding about twelve quarts, a basket for holding cheese, and a barrel for oil and other liquids. Some of the richer natives possess the more showy utensils, such as pewter plates, and spoons of silver. The highland Laplanders obtain all the artificial light which they require from the fire alone, but those on the coast use a rude sort of lamp. One or two shelves for cheese run along the upper part of the house; and a few rennet bags, containing the milk for winter use, are suspended from the roof. Oval fir boxes, answering for panniers, are employed in transporting their goods; two of them, weighing about two pounds each, are carried by one rein-deer. The most ornamental article of furniture is the cradle, which is a piece of wood hollowed out, and having a recess for receiving the head of the child, and being provided with cords, by which it is fastened to the mother's back when she travels. In shape it somewhat resembles the sledge, with the lower part open, and the upper protected by an arched covering made of leather, which shelters the head of the infant. It is stuffed with soft moss, is portable and safe, and, when slung on the back, the head of the child appears above the shoulders of the mother, whose hands are left at liberty, and who is otherwise little incommoded by her burden in travelling.

Herds. The herds of the Laplanders vary much in size, and this circumstance constitutes their riches or poverty. He who has 1000 rein-deer is accounted rich, though instances are by no means rare of one individual possessing 1500 or 2000 animals of this description. With three hundred a family may live in tolerable comfort, but with one hundred subsistence is precarious, and fifty reduces a Laplander to the state of a menial. He is no longer independent and able to keep a separate establishment, but generally joins his herd to that of a richer proprietor, whom he serves in the capacity of a servant, milking and tending the herd. Sometimes when thus reduced he migrates to the sea-coast, where he supports himself by fishing or otherwise. If successful in his efforts, he returns, purchases a herd, and resumes his pastoral habits. It more generally happens, however, that having once become a coast Laplander, he remains so to the last, being naturally too thoughtless and improvident to carry his views beyond the exigencies of the moment. Should the herd of the mountain Laplander be at all numerous, it rarely happens that the possessor is aware of the exact number, there being a superstition prevalent amongst them, that counting the flock, like numbering the heads of the Israelites, will be attended with evil. During the day they are allowed to wander over the hills where they please, but watched by a shepherd, who observes their motions, and is assisted in his duties by several dogs. These are in readiness not only to guard against any attack of wolves, but also to prevent the herd from being too widely dispersed, and to assist in bringing them to the fold in the evening to be milked. After they are brought into this enclosure, and secured by a cord attached to the horns, and held either in the hands, or fastened to some shrub, the women bring their bowls from the tent, and proceed in the operation in the usual way. Many of the deer are very refractory whilst this is going on, and, butting with

their horns, not unfrequently overthrow the female in attendance. The Laplander justly sets a very high value upon his dogs, the services of which are invaluable. The breed is remarkable for the smallness of its size, resembling the arctic fox in every thing but colour.

The employment of the highland Laplander may be said to be entirely confined to the care of his deer; and when not actively engaged in tending them, he most frequently stretches himself in his tent in a state of listless ease, or amuses himself by fashioning a rein-deer's horn into a spoon. But this monotony is occasionally broken by a hunting excursion, in which he pursues the bear and other animals. Ptarmigans, foxes, gluttons, martens, and other animals, he either shoots, or catches by means of traps and snares. He has several kinds of sledges, both for the conveyance of himself and of his effects. The pulk, which is intended for the use of merchants and other travellers, in form resembles a boat, and is about seven feet in length by sixteen inches in breadth, and generally about eight inches in depth, the back board or stern part being about sixteen. The head of the pulk comes to a point like a canoe; the stern is flat, and the bottom or keel convex. Above it has an oval half deck in front, covered with seal-skins. This is the close pulk; the open sledge wants the deck, but its general dimensions are similar to the other, and it is made, like it, of birch wood, although of ruder construction, and finished with less care. For the conveyance of goods, there is another open sledge of much larger dimensions, being about eight or nine feet in length, and of proportionate breadth. One deer is sufficient for a sledge, to which it is attached by a very simple harness, consisting of a collar of rein-deer fur for the neck, a trace which passes between the legs of the deer, and through a broad belly-band of cloth fastened round the body of the deer. There is of course a bridle and rein, and round the neck is a loose band of cloth, to which a bell is suspended, the sound serving to keep the party together. Although the difficulty of preserving the equilibrium of the pulk is at first very great, yet, so expert is the Laplander in guiding it, that the chief accidents that happen to him in his winter expeditions arise either from losing his way, or being caught by snow-storms or snow-drifts. Without these convenient vehicles it would be impossible to traverse a country so rugged and broken as Lapland, and even with this advantage as to locomotion, the difficulty is very great. The speed with which the animal travels is remarkable, ten miles an hour being easily accomplished at a trot, and probably double that space at a gallop. In the interior parts of Lapland travelling is suspended during summer, roads being unknown here; and it is only in winter that, by the aid of this invaluable animal, the country can be traversed. In some parts of Lapland, rein-deer have been made available for agricultural purposes, such as ploughing and harrowing; but this only happens when the proprietor is very poor. They are likewise employed during the winter season in drawing hay and fodder loaded upon trays. The Laplanders, especially those of Finmark, have a mode of travelling by means of the *skie* or snow-skait. It is made of wood, is very narrow, but frequently more than seven feet in length. In many parts of Lapland the greatest use made of them is in pursuit of wild rein-deer, and the other animals with which the country abounds. With these he makes rapid progress, and undertakes very long journeys without any other means of locomotion.

Various reasons induce the mountaineer to repair to the coast during the summer season. First, that his herd of deer may escape the gad-fly, with which, in June, July, and August, the rein-deer are much tormented; and secondly, to sell or barter the disposable commodities which he has collected during winter. These consist of the skins and horns of the deer which he has killed for the support of

Lapland his family during winter; and the skins of other animals which he has succeeded in capturing, such as the bear, fox, glutton, and marten, and the feathers of the ptarmigans which he has shot or ensnared. All these are valuable articles of commerce to him; and, by bartering them with the merchants of the coast, he is enabled to procure others that are necessary to his comfort in winter, such as coarse cloth, meal, gunpowder, and tobacco. It is also a matter of belief with the Laplander that it is absolutely necessary to the existence of his rein-deer, that they should once during the summer drink salt water; and this forms another and a very strong inducement for him to visit the coast. The deer eagerly drink salt water, and the draught is said to be efficacious in destroying the larvæ of the gad fly, which lays its eggs in the hide of the animal previously to quitting the forest. The annual migration of the Laplander commences in June, by which time the snow is generally off the ground, and consequently his mode of travelling is no longer in sledges. These, with all his winter necessities, are left behind him in his summer expedition, and he commonly deposits them in the storehouse which almost every highland Laplander possesses, near his church, in the neighbourhood of which he generally remains during the winter. The distance which he has to travel varies according to the situation of the coast to which he is bound, but sometimes exceeds three hundred miles. Sir Arthur de Capel Brooke, speaking of migrations, observes, "the Swedish Laplanders that repair to the coasts of Tromsö and Senjen belong chiefly to Tornea Lapmark, inhabiting the shores of the Tornea Träsk. These parts are also the resort of those from Enontekis, in Russian Lapland. The Laplanders from the other Lapmarks make for other parts of the Norwegian coasts which are nearest to them; and, though the distance may be less, they do not, I believe, ever bend their steps toward the Gulf of Bothnia, preferring the coasts of Norway, from the absence of wood, the freshness of the breezes, and the freedom from the insects which swarm in the forests that skirt the shores of the gulf, as well as in their own."

In studying the health and safety of their herd, they generally make choice of the numerous islands on the western coasts of Norway and Lapland, from their superior coolness, as well as from the absence of bears and wolves. These also present a great advantage in being very convenient stations for fishing, and possessing good harbours; whilst fish likewise resort in great numbers to the numerous fiords or bays, and narrow channels between them. This is the reason why on the whole of the northern line of coast the mainland is nearly uninhabited, with the exception of the borders of the fiords, though the only supply of wood is to be found there; whilst almost all the rocky isles so profusely scattered along the coast possess inhabitants, although generally barren in the extreme. After the mountain Laplander has reached his fishing station, he erects his tent of coarse wadmal cloth, and proceeds to barter his skins, furs, and other articles of commerce, for necessities which he requires, but principally for brandy, which he drinks to excess. Indeed it sometimes happens, that when he is about to return to his winter quarters, he is occasionally obliged, though reluctantly, to part with his deer, in order to supply himself with what is absolutely necessary to his existence. The mountain Laplander makes it a point to be paid in silver in all his dealings with the merchants; and he frequently amasses a considerable quantity of dollars, which he usually buries in the ground in some spot near his tent. In September, he breaks up his summer quarters, and gradually retires into the interior parts of the country. The circumstances which oblige him to return is the want of rein-deer moss on the islands, and also of fuel, both of which are readily procured in the in-

terior parts of the country. The want of the latter is said to have led to the gradual and almost entire depopulation of the Finmark coasts. His stock of necessities and household utensils are packed in a kind of wicker pannier, one of which hangs on each side of the deer, and, by slow and easy stages of six or seven miles a day, he reaches that part of the continent where he intends to fix his winter abode. Venison constitutes the principal article of food of the highland Laplander in winter, the only season when he kills his deer for supporting himself and his family.

The coast Laplanders support themselves entirely by the Fisher fishery, which is astonishingly productive, 2000 lbs. weight &c. of cod-fish being caught in a day by means of lines alone. From the great number of small Russian vessels which frequent the coast at certain seasons, they find a ready sale for the fruits of their industry, receiving in exchange chiefly meal, brandy, tobacco, and the like. Whales are abundant, particularly what is called the fin whale, which is long, active, swimming with great strength and speed, and consequently difficult to capture. It is usually killed by darting the harpoon into the body, and then breaking it close off. No more notice is taken of it at the time, but the wound generally proves mortal, and in a few days the animal is found cast upon some part of the neighbouring shore. The value of a good whale of this kind is about L.150, or 1000 specie dollars. The owner is known by a mark on the barb of his harpoon, by which he identifies his property; but law entitles the finder to one third of the booty. Great quantities of other kinds of fish, particularly the sey or coal-fish, are likewise caught. The latter are taken by means of nets, and this fishery constitutes one of the most lucrative branches of the Finmark trade, as does the down of the eider-duck. Plaice of a huge size, halibut, and echini of all hues and sizes, are likewise amongst the fish taken; but of shell-fish there are few or none, the northern shores, from their nature, being particularly barren of testacea. Halibut of 500 lbs. weight is frequently taken, and it is esteemed a great delicacy. The farming stock of the coast Laplander consists of a few sheep and goats, and sometimes a cow or two; but pigs are little known in Finmark, and do not constitute part of his property, sheep being of superior utility in furnishing him both with food and raiment; and his wants are, besides, very limited. On the approach of winter the whole of the cattle are brought from the mountains, where they are sent to graze during summer, and are shut up in stables. The weight of the cattle is not considerable. During winter, as a substitute for fodder, they are almost entirely fed upon fish, to which they are very partial. Some of the shore Laplanders keep rein-deer, but these animals very rarely constitute part of their property.

In their manual arts and manufactures, that is, making the various utensils which their mode of life requires, the Arts, manufactures, Laps display some ingenuity. Their sledges and canoes are very strongly and closely put together, so as to be entirely impervious to water. They tan hides with the first inner bark of the birch, make strong cordage and thread of the sinews of the rein-deer, weave coverings for their tents, knit gloves, fashion wooden utensils for domestic purposes; and the women prepare the skins of foxes, fawns, otters, and other animals for sale, by stripping off the membranous parts, and curing them with fish-oil. The Laplanders have a few amusements, but the chief is hunting, which, however, rather constitutes a part of their professional avocations, than of their choice pastimes. The bow and arrow, which formerly constituted their offensive weapons, are now supplanted by fire-arms, particularly rifles, in the use of which they are very expert. A taste for music and poetry have been attributed to the Laplanders; but this, Sir Arthur de Capel Brooke observes, is a mistake, arising from travellers mistaking Finns for Laplanders, a circumstance which very frequently takes place. Amongst the

Lapland. amusements of the Laplanders may be mentioned their occasionally assembling at feasts, where the favourite beverage, brandy, freely circulates, and mirth and noisy loquacity prevail. At marriage-feasts hundreds meet, and the ceremony is conducted with great formality and decorum; but the more solemn ritual of a funeral is characterized by an appropriate want of anything like parade or show.

Russian Lapland begins at the Waranger Fiord, under N. Lat. 70., and extends as far as the White Sea. Admiral Litke, in surveying its northern coast, in the years 1822-3, has noted down many interesting particulars, from which we derive the following notes:—

It may appear surprising, but it is nevertheless true, that this coast, navigated for three centuries by the first maritime nations, was, before Admiral Litke's survey, less known to us than many of the most distant and uninhabited parts of the globe. Vessels trading to Archangel had, for a long time, only the *Zeefahel* of the Dutch for a guide. Litke, June 1822, began his survey of the Lapland coast at Cape Orlov, in about N. Lat. 67. This, the eastern extremity of Russian Lapland, consists of high, steep, and bare rocks. Near Sviatoi Nos (in N. Lat. 68.) the coast has an inviting appearance; the S. side of the islands, or indentations, being covered with beautiful turf, wild leek, and a number of strawberries, but there were no bushes. On the main shore, however, were seen low dwarf birch and juniper bushes, and numerous tracks of rein-deer. During summer, as Admiral Litke was here informed, there is no land route through Lapland; and all who are then necessitated to travel,—as, for example, clergymen, the judges, or officers of judicial courts, &c.,—pass by *shnakes* along the shore, by stations, from Kola, round the whole peninsula, as far as Kandalaksha, in the extreme north-western point of the White Sea. Between Kandalaksha, however, and Kola, they manage to travel in the usual manner.

A little to the W. of Sviatoi Nos is the mouth of the Yukanka River, which is navigable for 3 to 4 sea miles up, when rapids commence, and prevent navigation, even for small boats. On the left bank of this river lies a Lopar village, called the Yukanka Lodge; for all places of the Lopares, both for summer and winter residence, are called by the Russians *pagosti* (lodges). The summer houses are entered about the beginning of May, and are inhabited until the first snow, when the winter quarters are re-entered, which are 150 to 200 wersts farther inland. The rein-deer, which the Lopares bring with them to this coast, are then let loose on the islands, or on the bogs, and in autumn they are found again by their tracks in the snow. Sometimes, however, rein-deer are lost on the bogs, or are devoured by wolves. On the islands, on the contrary, they are secure; but they would not all find food there. The Lopares are occupied during summer with fishery, and those on the Yukanka River chiefly take salmon, the neighbouring sea being poor in other fish. The fish taken is either used by themselves, or bartered for flour and other necessities, brought to them from various parts of the White Sea. Sometimes they lease for a summer the whole river, or part of it, to Archangel traders. One of their most important occupations during summer is the making of their *keroschki*, i. e., winter sledges, which resemble a pointed trough. During the winter, the Lopares are employed with fishery in the lakes, and with the chase. The Yukanka lodge consists of eleven vyeyi, inhabited by about sixty persons of both sexes. These vyeyi are made of wattles, of a conical shape, covered with thorn-bush branches and moss, and are from 7 to 10 feet wide, and 5 to 7 feet high. A small opening on the ground serves at the same time for window and door, whilst the smoke escapes through another hole at the top. In the middle of the vyeya is a hearth made of stones, where a fire is burning for the purpose of heating, cooking, and bread-baking: the latter is done in a most simple way, by

making a dough of flour and water, and forming it into a flat cake, which, with one side, is laid on a hot stone, and with the other, is turned to the fire, and, when done, is called bread. The place between the hearth and the wall is filled with branches, and covered with rein-deer skins, and there the inhabitants sleep, wrapping themselves up in other rein-deer skins. Around these vyeyi prevails a filth and disorder that is frightful: the entrails of fish, heaps of bones, dogs, kettles, sledges, and keroschki, are lying about pell-mell, spreading most offensive smells. The appearance of the Lopares themselves, however, is quite pleasing. The men are dressed in short woollen overcoats, mostly of blue colour, with a similar coat underneath, worsted stockings, and shoes. The women wear Russian *sarafanes*, and around the head the Russian *kakoshnik*, or handkerchiefs.

About 30 miles N.W. from Yukanka is Cherni Nos, or Black Cape; and near it, Noknev Island,—in earlier charts, called Nagel, or Nagol. Here Admiral Litke found that the needle showed no variation. On the main shore, near Noknev Island, the principal fishes caught are salmon, bib, *paltus*, and *piksha*. The *peshchanka* (sand-eel) is caught in a remarkable manner. Some time before ebb, the Lopares set about digging up the wet sand close above the strand line; with almost every step they dig out such a fish, to which, however, they must not allow a second's time, as otherwise it would be sure to dig itself in again, and escape. As soon as they perceive it, therefore, they seize it with a handful of sand and throw it violently on the ground. The fish, thus stunned, are collected in baskets or casks. It is strange that this fish is found only at ebb during the day, and never at night. The people of this place had also some sheep, which had abundant food in the adjoining pastures.

The chief island on the coast of Russian Lapland is Kildin, —not Kilduin, as the Dutch call it,—and lies 11 miles E. from the mouth of the Kola Bay. It is 9 miles long, and $1\frac{1}{2}$ to $3\frac{1}{2}$ miles broad. Its shores are high and precipitous on the N. side, and terminate abruptly in a perpendicular rock on the W., while on the S.E. side it slopes down gently to the sea. The appearance of the S. coast is most peculiar, rising as it does in four most regular terraces, forming an amphitheatre of 500 feet in height, with a flat table-like top. This coast is everywhere clothed with the richest verdure, forming a most striking contrast with the bare granite crags on the main shore. The island consists of primary slate, and thus differs from both the islands and the main shore to the south-eastward, which show only granite.

Rein-deer, belonging to Mr Popow, merchant in Kola, are pastured on this island. He introduced them here about twenty-five years ago, and since then their number has increased from two or three couples to several hundreds. Mr Popow permitted the Lopares to use these rein-deer on condition of delivering to him the skin of every beast killed, and paying him for the meat one *pud* of salmon, or other fish they may take during the winter in the lakes. Excellent mushrooms, called *mochoviki* (bog-mushrooms), grow in great abundance.

Kola, the capital of Russian Lapland, is situate at the confluence of the Rivers Kola and Tuloma, about 30 miles from the sea. As determined by Mr Rasumowski, who, in the last century, observed in this place the transit of Venus over the sun, the latitude of the city is 68. 52., the longitude 33. 1. E. from Greenwich. It appears that Kola was founded long before 1533, as English and other mariners traded already about the middle of the sixteenth century to Kola as to a well-known place. It was at first only a *wolash* (capital of a district), became under Peter the Great an *ostrog* (fortified place), and since the foundation of the stadtsholdership, the capital of a government. The place extends 530 fathoms along the River Kola, and 175 fathoms along the River Tuloma. Except a church built of stone,

Lapland. all the houses are of wood. The streets are paved with planks. On the bank of the Kola, near the centre of the town, lies a wooden fort, being a square with five towers: since the rupture with England, in the year 1800, the cannon of this fort were removed to the priory of Solowez, in order to put the latter in a state of defence; and since then, the walls of the fort serve only as a fence for the cathedral, and the towers are transformed into storehouses. The number of inhabitants of both sexes were estimated by Litke, in 1822, at about 800, but recent official data show that it was, in 1849, only 642.

As famous names like London, Paris, &c., call forth involuntarily the idea of incomparable splendour, uninterrupted pleasure, and constant happiness, so one thinks, at the name of Kola, of a direful place, the seat of extreme poverty, entirely separated from the civilized world, enveloped in enduring night. Human imagination seldom knows the middle course, and, accordingly, the latter notions are as incorrect as the former ones. The officials and merchants of Kola live in a style varying little from that of the capital. In external appearance, Kola is that of a clean town; and the houses, consisting frequently of two floors, are neat. The view of the town from the N.E. is most charming; it stands on a high and abrupt bank, from which a wide plain extends, bordered on three sides by high hills.

The principal trade of Kola is in fish, particularly in bib (*treshka*) and *paltus*. The Kolaers are not themselves engaged in fishing, but obtain the fish by barter, mostly from the Russian fishers trading on the Lapland coast, partly from the Norway ports of Wadsö, Wardhuus, Hammerfest, and even from Tromsö, to which ports the Kolaers are permitted to export about 2000 *tehetwert* of rye flour every year.

Kola *lodji* go to Archangel to barter their cargo of fish for the various merchandise they require, and some of them venture to set out from the latter place on their return home as late as October. Whilst the men of Kola are thus occupied, their wives and daughters do not remain idle. They cross in little boats to the islands to gather *moroshka*, the berries of *Rubus chamæmorus*. A boat contains usually but one young and able man, and from twelve to twenty women. Among the islands near the Bay of Kola, the Koreline Islands are considered to give the best produce of *moroshka*; they lie 5 miles W. from the mouth of the bay. The Kola women, however, will go still farther, to Motov Bay, and even to the Ainova Isles, at least 100 miles from Kola, in a boat. The *moroshka* from these isles are said to surpass in size and flavour all others, and are mostly destined for the imperial court.

The Bay of Kola, near the town, is so shallow, that even the smallest vessels can approach it only at high water. The River Kola ceases altogether to be navigable at the town; but the Tuloma is navigable for about 40 miles, namely, to its origin from the lake. Its banks are densely wooded with splendid fir.

There is a small and bare island in the middle of the Bay of Kola, called Solnoi Ostrow (Tallow Island), from the immense number of seals which formerly used to come ashore here, but which have entirely disappeared about the end of the last century.

W. from Kola is the Bay of Motov, and Ribachi, or Fisher's Peninsula, in old maps mostly presented as an island. This difference must not, however, be altogether attributed to the inaccuracy of the old charts; for it is not merely possible, but even highly probable, that this peninsula was once separated from the mainland; and this hypothesis is the more probable, because the rising of the Scandinavian peninsula has been noticed before. Almost throughout the whole extent of the coast of Lapland, traces were found by Litke, in a height from 4 to 9 fathoms, that the sea once attained that height. On the isthmus grow very straight

and thick birches; and in case of necessity, fuel can be procured from this wood, although with some difficulty. *Moroshka* grow in great plenty, and of exceeding beauty, on the shores of the peninsula.

The Bay of Motov is very remarkable on account of the whales which are driven in thither every year, in greater or smaller numbers. Sometimes, in the course of the summer, as many as ten whales are cast up; generally fewer, but they are seldom totally wanting. All the shores are covered with bones of these animals, or remains not yet thoroughly decomposed, which emit an insupportable stench to a great distance, and by which bears and other beasts of prey are attracted to the strand. The Lopares, to whom this district belongs, consider as their property everything that is cast up by the sea, and this forms one of their contested privileges. They sell the cast-up whales to the Pomarov, who come to them, for fish and fat. The usual price of a whale is 60 rubles, which is exceedingly moderate, when we consider the quantity of train oil to be obtained from a whale. These whales are probably the *Balæna physalus* and *B. mysticetus*.

On the western side of the Fisher's Peninsula is the Waranger Fiord, which has in its eastern portion the River Petchenga, celebrated, because on its banks dwelt St Triphon, the miracle-performer, who converted the Lopares to Christianity. The abode of this saint still exists at the embouchure of the River Triphonov into the Petchenga, 8½ miles from the mouth of the latter. In the sixteenth century stood there the convent of the Life-bringing Trinity, to which, in the year 1556, the whole coast of Lapland W. of the Gulf of Kola, with all the inhabitants, were given for an ecclesiastical district by Czar Joan Wasilevitch. In the deed of grant, the Bays of Motov, Liza, Ura, Patrez, and Nyawden, are mentioned, and also whatever the sea casts up, such as the whale, walrus, or similar animals. In the year 1589 this convent was destroyed by the Swedes, and afterwards transferred to Kola, but subsequently entirely abolished and combined with the convent of Archangel. On the Petchenga, the church alone remained, adorned, as we are told, with rich pictures of the saints. It has no minister of its own, but one comes there annually from Kola. Petchenga is the Mecca of the neighbourhood; for every Lopar of respectability considers it a duty to worship, at least once in his life, the relics of the God-pleasing saint. In times of danger, they make vows to go to Petchenga to pray.

In the Waranger Fiord, Russian Lapland ceases; and according to Admiral Litke, Cape Weres forms the boundary. It lies in N. Lat. 69. 58., and E. Long. 29. 50. from Greenwich.

One of the latest travellers who have added to our store of knowledge of Lapland generally, is Professor J. D. Forbes, already quoted. He visited a Lap encampment near Tromsö, and gives the following interesting description:—"We at length extricated ourselves from the wood, and crossing the stream, saw the Lap camp before us on a dry and pleasant grassy space, about 2½ English miles from the sea. Some piles of sticks and mounds, which seemed like no human habitation, first attracted attention. The piles of sticks form a sort of skeleton shed, which can be covered in bad weather by a kind of rude tarpaulin. They contain barrels, clothes, and many nondescript utensils and stores, which in fine weather are exposed suspended from the bare poles. Two low round mounds of turf, overlaid with sticks and branches in a most disorderly fashion, composed the habitations of a multitude of men, women, and especially children, who seemed at first sight to be countless. Their appearance—uncouth, squalid, and diminutive in the extreme—was, I thought, decidedly unprepossessing. But an attentive survey brought out some more favourable features. The countenance was altogether unlike any I had seen, but by no means devoid of intelligence, and even a certain sweetness of expression. Notwithstanding that our party was

Lapland.

tolerably numerous, they exhibited no signs either of distrust or shyness; and whilst some of them entered into conversation with one of the gentlemen from Tromsø, who knew a little of their dialect, and others went attended by several small active dogs to fetch some rein-deer for our inspection, from the heights, the greater part remained quietly engaged in their huts, as we had found them, quite regardless of our presence. On inquiring into their occupation, we were surprised to find them possessed of some excellently printed and well-cared-for books, particularly a bible in the Finnish tongue, and a commentary, each forming a quarto volume. We found some of them also engaged in writing. This was a matter of surprise, where we had been led to expect something approaching barbarism; and we had soon a proof that their pretension to religious impressions was not merely theoretical, for they positively refused to taste the spirits which were freely offered to them, and of which our party partook; though it is well known that excessive and besotting drunkenness used to be the great sin of the Lappish tribes, and still is of those who have not been converted to habits of order and religion by the zealous efforts of the Swedish missionaries who have indefatigably laboured amongst them.

"The Lap hut is formed interiorly of wood, by means of curved ribs, which unite near the centre in a ring, which is open, and allows free escape for the smoke, the fire being lighted in the centre of the floor. The exterior is covered with turf. The door is of wood on one side. The inmates recline on skins on the floor, with their feet towards the fire; and behind them, on a row of stones near the wall of the hut, are their various utensils. Their clothing—chiefly of tanned skins and woollen stuffs—looked very dirty. Their whole wealth consists in rein-deer. The two families who frequent this valley possess about 700 deer. We saw, perhaps, about one-fourth of that number. A few of them were driven, for our inspection, into a circular enclosure of wooden paling, where they are habitually milked. One of the men dexterously caught them by the horns with a *lasso*, or noose. The deer are small; but some of them carry immense branching horns, the weight of which they seem almost unable to support. At this season their long winter coat of hair came off by handfuls. They make a low grunting noise, almost like a pig. The milk is very small in quantity and excessively rich."

Population.

The whole population of Finmark does not exceed 45,000. The degrading superstition in which they were formerly sunk, has now in a great measure disappeared, along with those numerous deities which they worshipped: the wild creations of unenlightened nature have been superseded by Christianity, and a knowledge of the true God. Regular clergymen are established in the country by the different governments, and the Laps exhibit much reverence and devotional feeling during divine service, although its purport is only known to them through an interpreter. Finmark, in regard to ecclesiastical regulations, is under the jurisdiction of the Bishop of Norland and Finmark, both of which form one diocese. Swedish Lapland has a population of only about 12,000.

Language.

The language of the Laplanders is a Finnish dialect, with so great an infusion of foreign words, that the inhabitants of the two nations require an interpreter before they can understand each other's meaning. "The numerous cases," says Malte-Brun, "the varied terminations of nouns and compound verbs, the method of expressing pronouns by *affixes* joined to verbs, and, lastly, the negative conjugations, are characteristics equally applicable to the languages of Finland, Esthonia, and Lapland. The last is in some respects still poorer than the other two; thus there are five words for snow, seven or eight for a mountain; but honesty, virtue, and conscience must be expressed by a periphrasis. The Lapponic has been mixed, perhaps

still more than the other Finnic tongues, with the German and Scandinavian, which were spoken by the conquerors, who were too often the tyrants of the Finnic race." Some old Hungarian roots are also found in it, from which circumstance, as well as from others, it has been inferred that the Laplanders are the descendants of a Hunnic mixed with a Finnic people, or perhaps a distinct branch of the great Finno-Hunnic race. The principal roots and derivatives in the Lapponic tongue certainly bear less affinity with those of the languages of Upper Asia than any other Finnic dialect. See also *Leemii de Lapon. et Finmar. Commentatio.*

(J. F. S.) (A. P.)

LAR, a town of Persia, the capital of the province of Laristan, and formerly of an Arabian kingdom, is situate in a spacious plain at the foot of a range of hills, in N. Lat. 27. 30., E. Long. 52. 45., 180 miles S.E. from Shiraz. The inhabitants are chiefly employed in the manufacture of gunpowder, arms, and cotton fabrics. Among its buildings are a dilapidated fort, a handsome bazaar, said to be the best of the kind in Persia, and the fortified mansion of the klan, or governor. Pop. about 12,000.

LARCHER, PIERRE-HENRI, a learned Greek scholar, was born at Dijon in 1726. At an early age he gave himself up to the study of Greek and English, and made himself known by translations from both of these tongues. He greatly extended his fame by his controversy with Voltaire on the subject of that writer's *Philosophie de l'Histoire*. This work was thought highly dangerous by the orthodox, and Larcher was urged to reply to it, which he did in his *Supplément à la Philosophie d'Histoire*. He was thought to have the best of the argument; but his antagonist, in a rejoinder, entitled *Défense de mon Oncle*, overwhelmed him with ridicule and persiflage. Larcher incautiously adopted the same style in his *Réponse*, but in that vein he was no match for his opponent, and to all the future sneers of Voltaire he did not dare to reply. In 1775 he published his *Mémoire sur Venus*, which was crowned by the Academy of Belles-Lettres. Three years later he became a member of that society, and contributed to its Transactions some valuable papers, chiefly on the vases and festivals of some of the nations of ancient Greece. When the Imperial University was instituted, Larcher was made titular professor of Greek; but he was then eighty-three years of age, and could only do duty by deputy. He died in 1812 of the effects of a fall.

Of Larcher's translations may be mentioned the *Electra* of Euripides; Xenophon's *Apologia* and *Anabasis*; Pope's *Martinus Scriblerus*. His name, however, is kept alive chiefly by his *Herodotus*, which appeared in 1786. From the first it was condemned as clumsy and inelegant, though correct in the main; but the value of the geographical and chronological notes was acknowledged as great. Even these have been now, to a great extent, superseded by the later researches of Rennell, Niebuhr, Dahlmann, Jäger, and Bähr.

LARDNER, NATHANIEL, D.D., author of the *Credibility of the Gospel History*, was born in 1684 at Hawkhurst, in Kent. On leaving the school of his native town, he went to study in London, in the academy of Dr Oldfield, a Presbyterian dissenter; and at the age of sixteen, according to a custom then common among the English dissenters, he went over to Holland, and studied there for three years under Burmann, Grævius, and D'Uries. He returned to England in 1703, spent six years more in the special study of theology, and took license in 1709. He was not popular as a preacher. His elocution was bad, chiefly from deafness, being such that he could not modulate his voice properly. In 1713 he entered the family of Lady Treby as private chaplain and tutor to her son, and remained with her till she died in 1721. From this time till his death he devoted himself almost wholly to the writing of those works, which have given him a foremost place among the

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Lardner.

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theological scholars of Britain. His public duties were limited to occasional lectures in the Presbyterian chapel at Old Jewry. Though the value of his writings was freely acknowledged, he was very meanly remunerated for them. A small property which he possessed in his native town secured him against the worst evils of poverty. At the time of his death, which happened at Hawkhurst, in 1768, he had completed his eighty-fourth year.

The most important of Lardner's works is his *Credibility of the Gospel History*, in which proofs of the truth of Christianity are brought together from innumerable sources in religious history and literature of the first five centuries. It was published between 1730 and 1757, and still holds its place as one of the strongest bulwarks of revealed religion. The *Supplement* to this work, and the *Large Collection of Jewish and Heathen Testimonies*, are in an equal degree distinguished by profound learning and close and cogent reasoning. The composition of these works occupied the better part of forty-three years. Of the less elaborate essays thrown off during this time, the most important was his *Letter concerning the question, Whether the Logos supplied the place of the Human Soul in the Person of Jesus Christ*, in which he openly professed himself a Socinian. There are two complete editions of Lardner's works, one in 11 vols. 8vo, edited, in 1788, by Dr Kippis; and another in 5 vols. 4to, Lond. 1815.

LARES, the household gods of the Romans, whose images stood on the hearth in a little shrine (*ædes*) or a small chapel (*lararium*). The name is of Etruscan origin, and signifies kings or heroes. The Lares seem to have been identical with the Manes, but it was only the spirits of good men that were worshipped as such. Of the domestic Lares, the *Lar familiaris*, as founder of the family, was the chief, and was always taken with the family in its changes of abode. In every household there were generally two Lares at least, and they were either clad in the skin of a dog, or represented with a dog at their feet. In their hands they held a cornucopia; and on their festivals, which fell on the first of May, they were crowned with garlands, and worshipped with sacrifices. Besides the *Lares domestici et familiares*, there were also *Lares compitales et viales, militares et marini, urbani, rurales, &c.*

LARGS, a port and watering-place of Scotland, county of Ayr, on the Firth of Clyde, 22 miles W.S.W. from Glasgow. Weaving and fishing form the chief occupation of the industrial classes. Adjacent to the town is the battlefield of Largs, where Alexander III. defeated Haco, King of Norway, in 1263. Tumuli and cairns still mark the ground. Pop. (1851) 2824.

LARISSA (Turkish *Yenitche*), a town of European Turkey, the ancient and modern capital of Thessaly, on the right bank of the Selembria, here crossed by a bridge of ten arches; 37 miles E. by N. from Trikala; N. Lat. 39. 52., E. Long. 22. 40. 23. It is composed of unsightly miserable houses, built of clay and wood, and forming streets narrow, crooked, and filthy. Manufactures of silk, morocco-leather, and cotton. A Greek metropolitan church, several mosques, and some bazaars occupying an open area in the centre of the town, are worthy of notice. Pop. about 25,000, three-fourths of whom are Turks.

LARISTAN, a maritime province in the S. of Persia, extending from N. Lat. 26. 30. to 28. 25., and from E. Long. 52. 30. to 55. 50., is bounded S. by the Persian Gulf, W. and N. by Fars, and E. by Kirman. Its greatest length from E. to W. is 210 miles; its greatest breadth from N. to S., 120 miles. Area 16,000 square miles. It consists of two parts: the northern and upland part, skirted by a long chain of mountains running from S.W. to N.E.; the southern and lowland part, consisting of steppes of sand and salt, interrupted at intervals by rocky mountains. The only important river is the Nabou, in its western corner. On the

Larne
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Lascaris.

coast, the inlets of the sea are numerous. Among the northern mountains there are some fertile tracts, yielding dates and other fruits. Of the products of the rest of the province, the chief are camels, salt, and silk. The coast is inhabited by independent Arab tribes. The capital of the province is Lar.

LARNE, a sea-port and market-town of Ireland, county of Antrim, on the N. shore of Lough Larne, 18 miles N.N.E. from Belfast, of which it is an out-port. The manufactures are cotton, sails, ropes, and leather; and the trade carried on is almost exclusively in slate, lime, timber, and coals. The chief object of interest is the ruined castle of Oldfleet, erected in the reign of Henry III. It is the seat of a poor-law union, and of a petty sessions court. Edward Bruce landed there in 1315. Pop. (1851) 3074.

LARNICA, or LARNECA, a town on the S. coast of the island of Cyprus, on a marshy plain, about a mile from the shore, and 23 miles S.E. from Lefkosia. The houses are built of mud, and only one storey in height, through fear of earthquakes. It has a citadel, a cathedral, two convents, a mosque, and several cisterns. Larnica is the chief place of trade in the island, and the residence of the European consuls. The principal exports are wine, silk, wheat, cotton, and drugs. Rice and sugar are imported from Egypt; cloth and hardware from Malta and other places. Larnica is near the site of the ancient Citium, the birthplace of Zeno the Stoic, and contains many vestiges of antiquity. Pop. about 4000.

LASCARIS, CONSTANTINE, an eminent Greek scholar of the fifteenth century, was a member of the royal house of Lascaris, and was born at Constantinople, but in what year is not known. When the Turks became masters of that city in 1453, he sought an asylum in Italy, where Francesco Sforza, Duke of Milan entrusted him with the education of his daughter Hippolyta, afterwards married to Alfonso, King of Naples. On leaving Milan, he went first to Rome and afterwards to Naples, in both of which cities he taught Greek and rhetoric. A few years later, when on a visit to Messina, he was so cordially received by the inhabitants that he determined to settle there. The school which he established enjoyed a great reputation till his death in 1493. Among his pupils was the celebrated Bembo. Lascaris bequeathed his library and valuable MSS. to the senate of Messina. They were afterwards carried off to Spain, and are now preserved in the Royal Library of the Escorial. His published works are—*Grammatica Græca, sive Compendium octo Orationis partium*, Milan, 1476, in 4to, being the first book printed in Greek; *Two Opuscula* on the Sicilians and Calabrese, who had written in Greek, published, for the first time, by Maurolico in 1562. A Dissertation on Orpheus, printed in the first volume of the *Marmora Taurinensia*, from a manuscript in the library of the King of Sardinia. These works, though now of little value, were useful in their day, by reviving the study of the Greek tongue in countries where it had long been dead.

LASCARIS, *Andreas Joannes*, a learned Greek, of the same family with the preceding, and surnamed *Rhyndacenus*, because he was born on the banks of the Rhyndacus, in Bithynia. On the Turkish conquest of Constantinople, he took refuge at the court of Lorenzo de' Medicis, who sent him to Greece to collect valuable MSS. in that country. Lascaris returned with a large number, and a few years afterwards, made a second voyage to Greece for the same purpose. Before his return, Lorenzo died, and Lascaris, on the invitation of Charles VIII., removed in 1495 to Paris, and began to teach Greek publicly. Among his pupils were Budæus and Danes. In 1503, and again in 1505, Louis XII. appointed him to the embassy of Venice; and at a later period Leo X. invited him to Rome, to take charge of the Greek college newly founded there. In 1515 the pope sent him on a mission to Francis I.; and this prince,

Las Palmas sensible of his merits, endeavoured to retain him in France. Lascaris, however, returned to Rome the same year; but he revisited Paris in 1518, and, along with Budæus, was employed to form the Royal Library of Fontainebleau. Francis I. then appointed Lascaris his ambassador to Venice, as his predecessor had done; and he remained in that city until Pope Paul III. urgently pressed him to settle at Rome. Though suffering seriously from bad health and the infirmities of old age, he immediately set out; but he only survived his arrival at Rome for a few months, dying in 1535, at the age of nearly ninety.

The principal works edited by Lascaris are—*Anthologia Epigrammatum Græcorum, libri vii.*, Græce, Florence, 1494, in 4to; *Callimachi Hymni Gr. cum scholiis Græcis*, ibid. in 4to, the *editio princeps*; *Scholia Græca in Iliadem, in integrum restituta*, Rome, 1517, in folio, a very rare edition; *Homericarum Quæstionum liber, et de Nympharum antro in Odyssea opusculum*, ibid. 1518, in small 4to, the *editio princeps*; *Commentarii [Græci] in septem Tragædias Sophoclis*, ibid. 1518, in small 4to. He also translated into Latin some treatises of Polybius on the military art. The following smaller works are also ascribed to him—*Epigrammata Græca et Latina*, Paris, 1527, in 8vo, and 1544, in 4to; *De veris Græcarum Litterarum formis ac causis apud Antiquos*, Paris, 1536, in 8vo; *Orationes, Francfort, 1575*. The *Nuova Scelta di Lettere*, by Bernardo Pino, contains one of Lascaris. (J. B.—E.)

LAS PALMAS. See CANARY ISLANDS.

LASSA, or **H' LASSA** (*Land of the Divine Intelligence*), the capital of Tibet, is situate in a fertile plain on the banks of the Dsang-tsu, 30 miles above its junction with the Dsang-bo, in N. Lat. 29. 30., E. Long. 91. 40. The city is composed of wide and regular streets, lined with houses built of mud, brick, or stone, and having their walls whitened, and their doors and window-frames painted with the sacred colours, red and yellow. Lassa is the chief seat of commerce in Tibet, and the resort of merchants from all parts of Asia. The principal articles of its trade are linens, woollen cloth, Cashmerian shawls, sable furs, raw silk, musk, sugar, dried fruits, sweetmeats, bullion, glass, and cutlery. Foreign merchants and workmen reside in parts of the city allotted to them, according to their nations. The women of Lassa cover their faces with a thick dark varnish before appearing in public. The town is walled, and contains some fine public edifices, the chief of which is the lamasery of Moru. In the suburbs are situate the four largest lamaseries in Tibet—Prasbung, Sera, Samie, and Pobrang-Marbu. The last of these, built on Mount Botala, to the N.W. of Lassa, is the residence of the Dalai-Lama, is 367 feet in height, and said to contain 10,000 rooms. These lamaseries are attended by thousands of students from different parts of Asia. Pop. of city and suburbs, about 50,000.

LASUS, or **LASSUS**, a Greek poet and musician, respecting whom only a few facts have been transmitted to us. He was the son of Charbinus, a native of Hermione, in Argolis, and flourished about the sixty-ninth olympiad (B.C. 504), during the reign of Darius I., King of Persia. Some of the ancients put Lasus in the number of the seven wise men of Greece, to the exclusion of Periander of Corinth. He was the first who wrote on the theory of music, and joined example to precept, being also an excellent musician. According to Clemens of Alexandria, he was the inventor of dithyrambic verse; he was at least the first to introduce it at the public games, and instituted prizes for the successful candidates. (Suidas, *Aristoph. Schol. Vesp.* 1401.) We are informed by Herodotus (vii. 6), that Lasus caused the poet Onomacritus to be banished from Athens by Hipparchus, because he interpolated the poetry of Musæus with false prophecies. He was the contemporary of Simonides, and the instructor of Pindar.

(*Thom. Mag. Vit. Pind.*) Athenæus (viii. 20) has preserved some witticisms of Lasus, which do not tend to raise him in our estimation. He quotes also a hymn to Ceres of Hermione, and an ode entitled the *Centaurs*, in neither of which he had made use of the letter S (x. 455; xiv. 624). (See *Les Remarques de Burette sur le Dialogue du Plutarque touchant la Musique*, in the *Mém. de l'Acad. des Inscrip.*, xv., p. 324.) (C. T. R.)

LASWAREE, a small village of Hindustan, in the rajpoot territory of Macherry, or Alwur, the scene of a desperate battle fought between the British army and Scindia on the 1st November 1803, in which the former obtained a complete victory. In this engagement the Mahratta force, consisting of 9000 infantry and 3000 cavalry, under the command of General Dudermaigne, a French adventurer, was attacked by Lord Lake with his cavalry, which he had, by a forced march, brought on in advance of his infantry. The British cavalry suffered dreadfully, especially from the well-served artillery of the Mahrattas, but after the arrival of the infantry the fate of the day was no longer doubtful. The British arms steadily advanced, and by four o'clock in the afternoon the destruction of the hostile army was complete. A medal, commemorative of the victory, was struck in London in 1851, and presented, with the sanction of her Majesty, to the surviving officers and soldiers who were present at the engagement. The village of Laswaree is 128 miles S. of Delhi. Lat. 27. 33., Long. 76. 59.

LATAKIA, or **LADIKIYEH** (*Laodicea ad Mare*), a seaport-town of the Levant, in the pashalik of Tripoli, is situate on a short tongue of land opposite the north-eastern promontory of Cyprus, 78 miles N. of Tripoli, in N. Lat. 35. 30., and E. Long. 35. 48. It was founded in the beginning of the second century B.C. by Seleucus Nicator, and named, in honour of his mother, Laodice. The surrounding country was at that time very fertile, and produced celebrated wine, which was exported to Alexandria in large quantities. Many ancient remains are to be seen in the town and neighbourhood. The most striking of these is a triumphal arch, or town gate, situate at the S.E. corner of Latakia, and supposed to have been erected in honour of Cæsar Septimius Severus. It is from 30 to 40 feet high, has four door-ways, and is almost entire. Besides this edifice there are the remains of numerous tombs and mausolea, with defaced inscriptions in Latin and Greek. The modern town is divided into two portions, the landward and seaward. The latter, called *La Scala*, or *Marina*, forms the port of the town proper. It is composed of a single range of buildings running parallel with the shore, and is connected with Upper Latakia by a roadway, lined in some parts with houses and villas. Its harbour, formed by a natural basin, and once protected on the N. by a fortress, now in ruins, is sheltered on all directions but the W. It has, however, no depth of water for large vessels. The custom-house, merchants' stores, and British, French, and Austrian consulate offices are situate here. Upper Latakia is $1\frac{1}{2}$ mile distant from the port, the ground intervening being laid out in gardens. It is in a dilapidated state, in consequence of the frequent earthquakes which have visited its neighbourhood, and the streets are, like those of most eastern towns, narrow, tortuous, and dirty. The houses are, for the most part, built of cut stone, with two storeys, flat roofs, and an inner court. The principal buildings of the town are a mosque, adorned with the columns and carvings of some ancient edifice, two Greek churches, and a bazaar. The trade of Latakia is considerable. Its exports include tobacco, cotton, bees'-wax, scammony gum-resin, and sponges; in return for sugar, coffee, cotton, and woollen goods, imported from Western Europe. Its tobacco has long been famous, and is the principal article of export. Latakia and Alexandretta are

Laswaree
Latakia.

Lateran
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Latham.

the two ports of Aleppo. Latakia is the see of a Greek bishop. Pop. estimated at 7000.

LATERAN. See ROME, and COUNCILS.

LATHAM, JOHN, M.D., one of the most zealous and successful of English ornithologists, was born June 27, 1737, at Eltham, in Kent, where his father was a respectable general medical practitioner. He received his elementary education in the Merchant Tailors' School in London, whence he was removed, at the age of fifteen, to commence his medical studies under Dr William Hunter, and the other teachers in the London schools, and in the hospitals of the capital. At the age of twenty-six he was established at Dartford, to follow his father's profession; but he had early devoted his leisure hours to the study of natural history, and especially to ornithology; for, in 1771, he was a valued correspondent of Pennant, and assisted Sir Ashton Lever in the arrangement of his noble museum.

In 1781 appeared the first volume of Latham's most valuable *Synopsis of Birds*, which continued to be published in successive parts to 1785. In his title-pages, this work is stated to be in three volumes; but the second and third volumes are each divided into two parts, so that the *Synopsis* makes really six quarto volumes, to which two supplemental volumes appeared in 1787. In this work he adopts the two great divisions of his countryman Ray, into *land* and *water* birds, as more natural than the six orders of Linnæus, who has introduced the water birds between the pies and the waders, and before the *gallinæ* and the *passeres*. Latham, however, has retained the Linnæan genera, with a few exceptions; for which deviations he assigns sufficient reasons. The descriptions of individual birds in this work have never been exceeded in clearness and fidelity; and although the modern ornithologist may consider the Linnæan arrangement and generic distinctions now rather antiquated, the work of Latham has no rival in the English language for accuracy of detail, or the ease with which the young ornithologist can name, and refer to its place in the system, any bird he examines. The figures given in this work are all etched by the author's own hand, from specimens in his possession, prepared and stuffed by himself, and are excellent representations of the birds. Gmelin's edition of the *Systema Naturæ* appeared in 1788; and any one who consults it will find how largely the labours of Latham have contributed to the Linnæan ornithology.

In 1791 Latham published his capital *Index Ornithologicus*, an admirable book of reference, in which many new species are introduced, and prove how sedulously the author cultivated this branch of natural history.

He had become a member of the Royal Society in 1775, corresponding member of the London Medical Society in 1778, and was one of the founders of the Linnæan Society. His fame as an ornithologist was firmly established, and honours flowed in on him; he received the honorary degree of M.D. from the University of Erlangen, and was elected a corresponding member of the Natural History Society of Berlin, and of the Royal Society of Stockholm.

In 1796 Dr Latham retired from medical practice, and took up his abode at Romsey, in Hampshire. There he lived for some years, still cultivating his favourite study, when a severe reverse of fortune overtook him, and he retired to the house of his son-in-law, Mr N. Wickham, at Winchester, in 1819. There he began to prepare for publication his great work, entitled *General History of Birds*; and even in his old age, retouched the plates that had suffered from the many impressions thrown off. The first volume of this work appeared in 1821, and was followed by the sequel, until it reached ten quarto volumes, all equally clear and accurate with his former works. It is perhaps, however, to be regretted that he still followed the Linnæan system, instead of adopting one more adapted to modern discoveries, as that of Temminck, or of Cuvier.

Laticlave
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Latimer.

Besides these valuable works on natural history, Dr Latham published only a few medical tracts and some contributions to societies of which he was a member.

After a short illness, he died on 4th February 1837, in the ninety-seventh year of his age, and was buried in the abbey church of Romsey.

(T. S. T.)

LATICLAVE. See ANGUSTICLAVIA.

LATIMER, HUGH, bishop of Worcester, the only son of a yeoman, was born about 1472, at Thurcaston, in Leicestershire, and studied at Christ's College, Cambridge, where he took a degree. At the age of thirty, although formerly a zealous Papist, he became a zealous a Protestant, chiefly through the influence of Bilney. Being one of the twelve licensed preachers of the university, he boldly avowed his new opinions, and was summoned, along with his friend Bilney, on a charge of heresy, before Cardinal Wolsey. On subscribing certain articles, they were liberated. Latimer, however, retaining the same fearless spirit, wrote a letter to Henry VIII., protesting against the sin and evil of prohibiting the Bible in English. The King was so far from being offended at this, that, on the recommendation of Cromwell, he appointed him to the living of West Kinton, in Wiltshire. Here he preached so violently against Popery, that in 1531 he was cited to appear before the Archbishop of Canterbury, and the Bishop of London. Cromwell's patronage, however, not only shielded him from danger, but recommended him as chaplain to Anne Boleyn, and advanced him, in 1535, to the bishopric of Worcester. When the famous Six Articles were passed in 1539, Latimer, vacating his bishopric, retired into the country, but coming to London soon afterwards for the cure of a severe injury, he was accused, at the instance of Gardiner, and thrown into the Tower, where he lay for six years. On the accession of Edward VI. in 1547, he was liberated, but refusing, on account of his age, to resume the duties of his bishopric, he remained at court, and became famous for his impartial reproof of the vices of the age. Mary's reign began in 1553, and Latimer was cited before the Privy Council. As he was in the country at this time, and was allowed to obey the citation of his own accord, he might have foiled his enemies by flight. Nevertheless, he set out for London, remarking as he passed through Smithfield, that it had long groaned for him. The Privy Council, after examination, committed him to harsh confinement in the Tower; and in April 1554 he was sent to Oxford, along with Ridley and Cranmer, to hold a disputation with several doctors from the universities. Latimer, alleging his unfitness for a verbal dispute, on account of age, sickness, and disease, delivered his opinions in writing, and was condemned as a heretic. Another attempt to make him recant, was met by his refusal "to deny his master Christ, and his verity;" and accordingly he was doomed, along with Ridley, to be burnt at Oxford on the 16th October 1555. He met his fate with great courage, exhorting his fellow-martyr with these well-known words, "Be of good comfort, Master Ridley, and play the man. We shall this day light such a candle, by God's grace, in England, as, I trust, shall never be put out."

The chief feature in Latimer's character is his piety, alike earnest and cheerful, bold and simple-minded. His heroic zeal for truth and virtue, which sometimes seemed a want of common prudence, was well exemplified when he presented to Henry VIII., for a Christmas present, a Bible marked at the passage, "Whoremongers and adulterers God shall judge." His sermons (the latest edition of which was published at London in 1825) were peculiar in their day for their simplicity of plan and enforcement of practical piety. But the features most striking to us, are a pithy common sense, a colloquial familiarity, and the ingenious and superabundant use of homely imagery; which qualities, although they may now savour of a want of taste, rendered Latimer one of the most impressive preachers of his time.

Latitudi-
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Latium.

LATITUDINARIANS, the name given to certain English writers who flourished towards the close of the seventeenth century. It was applied more especially to such men as Hales, Chillingworth, Cudworth, Tillotson, Henry More, &c., who gave a philosophical tone to the principles of their theology. They endeavoured to steer a middle course between the extreme Whigs and Tories of the period; between the strict Presbyterians and Independents on the one hand, and the more intolerant Episcopalians on the other; but were branded by both as deists and atheists, as well as Latitudinarians. Their creed most nearly approximated that of the Dutch Armenians; but, as their name implies, they allowed considerable latitude on theological subjects. The Latitudinarian divines were raised to prominent places during the reign of Charles II. Their cause is defended by Fowler, Bishop of Gloucester, in a work entitled, *The Principles and Practices of certain Modern Divines of the Church of England, abusively called Latitudinarians, Truly Represented and Defended, by way of Dialogue*, 8vo, London, 1670.

LATIUM, the country of the Latini, a division of ancient Italy, on the eastern shore of the Tuscan Sea. The etymology of the word is very doubtful. The Romans, accepting the old myth, that Saturn *hid himself* there when dethroned by his son, derived it from *lateo*. Another tradition derived it from the same source, either because the first inhabitants lived or hid themselves in caves, or because the whole country was hidden or sheltered from the rest of Italy by the barrier of the Apennines. A modern etymon, connecting Latium with *latus*, broad, is untenable from the difference in quantity of the roots of the two words. The probability is, that Latium, like most ancient countries, took its name from its inhabitants, and did not give name to them, and that it means nothing else than the land of the Latins. In the classics, the name is used in two widely different senses,—1st, In the early history of Rome it indicates strictly the country of the Latini; 2d, In the later history of Rome it is applied to all the territory stretching from the Tiber to the Campanian frontier, and from the Tuscan Sea inland to Samnium and the Sabini. The original Latium, or *Latium Antiquum*, was bounded on the N. by the Tiber, on the E. by the Apennines, on the W. by the Tuscan Sea. On the S. the boundary was somewhat vaguely fixed; but the whole of the marshy district known as the “Ager Pomptinus,” as far S. as the Prom. Circeum, seems to have belonged to the Latins from a very early period. The southern frontier was a kind of debateable land, occupied at one time by the Latins, and at another by the Volsci; and the border towns, whose origin was perfectly well known, are often mentioned indifferently as Latin or Volscian. A similar state of things reigned on the N. frontier of Latium, where it marched with Sabinum. The whole extent of ancient Latium was very inconsiderable. From Ostia to the Prom. Circeum the coast-line only measured 60 English miles; the greatest length of the country did not exceed 64 miles, while its greatest breadth was about 28. When the league known as the “*Fœdus Cassianum*” was formed between the Romans and the Latins soon after the beginning of the fifth century B.C., the cities which went to form the Latin nation were the following:—Ardea, Aricia, Bubentum, Corniculum, Carventum, Circeii, Corioli, Corbio, Cora, Fortinium, Gabii, Labicum, Lanuvium, Lavinium, Laurentum, Nomentum, Norba, Præneste, Pedum, Querquetulum, Satricum, Scaptia, Setia, Tellene, Tibur, Tusculum, Toleria, Tricrinum, Velitræ. This is the list as preserved by Dionysius. Pliny increases the number from 29 to 53, all of which had perished long before his day, without leaving a trace behind; besides 31 others, which in various degrees of prosperity or decay were still extant. These thirty-one were Algidum, Alba Longa, Antium, Apiola, Ardea, Aricia, Artona, Aurunca, Bovillæ, Circeii, Cora, Corbio, Fabium,

Ficulca, Forum Appii, Gabii, Labicum, Lanuvium, Laurentum, Lavinium, Mugilla, Nomentum, Norba, Ostia, Præneste, Setia, Suessa Pometia, Tibur, Troia, Tusculum, Ulubræ, and Velitræ. Probably there never was a spot on the earth's surface on which so many cities were crowded into so small a space as in ancient Latium. Yet the existence of all these cities is matter of authentic history. Latium Novum comprised, in addition to the whole of the ancient Latium, the country of the Æqui, Volsci, Hernici, and Aurunci, or Ausonians. Its northern frontier remained unchanged; on the E. and S. it was extended as far as the Marsi, Samnium, and Campania. The Liris was vaguely used as the line of demarcation between Latium and Campania. At some points, however, Latium did not reach that river, at others it went beyond it. The Volscian country, when incorporated with Latium, comprised a large tract on both banks of the Liris, with the whole mountain district round Arpinum and Atina on the Samnite frontier. Under Augustus, Latium and Campania formed together the first of the eleven regions into which Italy was distributed for purposes of government. The physical geography of Latium is given under ITALY, CAMPAGNA DI ROMA, and PAPAL STATES.

LATMUS (*Monte di Palatia*), a mountain on the confines of Caria, famous for the fable of Endymion, of whom Luna was said to be enamoured: hence called *Latmius Heros*, and *Latmius Venator*.

LATREILLE, PIERRE-ANDRÉ, an illustrious French naturalist, the “Prince of Entomologists,” as he was called by the Comte Dejean, was born at Brives in 1762. He early gave evidence of a strong capacity, and it was resolved to educate him for the church. A kind friend placed him at the Collège Lemoine at Paris, where he remained for several years. During a subsequent visit to the capital, he found means to make himself known to the leading naturalists of the day, Fabricius, Olivier, Lamarck. In 1791, he became a correspondent of the Society of Natural History of Paris, and of the Linnæan Society of London; and contributed many of the entomological articles to the *Encyclopédie Méthodique*. When the Revolution broke out, he was still in orders, and was involved in the general fate of the priesthood; but the interest of his powerful friends saved him from ruin. The storm began to blow over, and in 1798 Latreille was employed to arrange the collection of insects in the museum. He was next appointed to assist Lamarck, when that distinguished naturalist was disabled by blindness. On his death, in 1829, Latreille was promoted to his chair. He did not long survive his predecessor, dying February 6, 1833, at the age of seventy. In 1814 he had been made a member of the Academy of Sciences, and seven years later a chevalier of the Legion of Honour. It has not been thought necessary here to describe his labours, which are analyzed at great length in the bibliographical part of the art. ENTOMOLOGY, vol. ix., p. 8. To Cuvier's *Regne Animal* Latreille contributed the whole of the *Crustaceans*, *Arachnides*, and *Insects*.

LATRUNCULI, draughts, the pieces of a Roman game which in some respects resembled chess. They were generally coloured black or white, to distinguish the sides on which they were played, and their movements along the *mandræ*, or spaces of the board, were defined by fixed laws. The number of pieces seems to have varied from five to twelve, and in later times the game was converted from one of skill to one of chance, by the use of the *tesseræ*, or dice. The invention of the game is by some attributed to Palamedes, and it was certainly common in the days of Homer. Seneca attributes it to Chilon, one of the seven Greek sages. Like chess, the game runs back to an unknown antiquity.

LAUBAN, or LUBEN, a town of Prussian Silesia, on the left bank of the Queis, 40 miles W.S.W. of Liegnitz. It is walled with four gates, and is the seat of judicial courts for the circle. It has a Roman Catholic and three

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Laud.

Protestant churches, a gymnasium, orphan asylum, and two hospitals. Chief manufactures, linen and woollen stuffs. Pop. (1849) 6261.

LAUD, WILLIAM, Archbishop of Canterbury in the reign of Charles I., was born at Reading in 1573. His father was a wealthy clothier, and his mother a sister of the Lord Mayor of London. After receiving his education in his native town till his sixteenth year, he entered St John's College, Oxford, of which he became a scholar in 1590, and a fellow in 1593. He was ordained a priest in 1601; and in the following year read a divinity lecture, which was thought at the time to savour strongly of Popery; and which awakened in the mind of Dr Abbot, then master of University College, that unfavourable opinion of Laud, which time only confirmed. In 1605, being chaplain to the Earl of Devonshire, he sanctioned, by performing the rites of marriage, an illicit connection between that nobleman and Lady Rich, whose husband was still alive. This act, for which he used to read a penitential service every year, proved for a long time an insurmountable barrier to his preferment in the church, and confined his ambition to rapid changes in the lower walks of ecclesiastical service. He became vicar of Stamford in 1607; and in the following year he received the living of North Kilworth, and was made chaplain to Bishop Neile, who became his patron and friend. In 1609, the living of West Tilbury came into his hands, and in 1610 that of Cuckstone, which, on account of his health, he exchanged, in the same year, for the benefice of Norton. In 1611, through the influence of Neile, and in spite of the counter-influence of Abbot, he was elected president of St John's College, and was soon after appointed one of the king's chaplains. After a stay of five years at court, in undisguised disgust at the slowness of his preferment, he was presented with the deanery of Gloucester, where, more than by the faithful memories of court-gossips, his life was embittered by the Calvinism of the bishop. Laud accompanied King James to Scotland in 1617. With considerable reluctance the king raised him to the see of St David's in 1621; and Laud, in consequence, resigned his presidentship. He is thought to have been concerned in the framing of the royal edict of 1622, by which any pastor under a bishop or dean is prohibited from preaching on predestination, and other difficult doctrines mentioned. In the same year took place the famous "Conference with a Jesuit," in which Laud assisted to establish the sinking faith of the Countess of Buckingham; and was rewarded by becoming the confessor of her son the Duke. This is supposed to be the meaning of that passage of his diary, where he writes that he became "C." to the Duke of Buckingham. By the Duke's influence, and at his own earnest request, he became, in 1624, a member of the Court of High Commission, from which he had been excluded by the old enmity of Abbot, Archbishop of Canterbury. The accession of Charles I. increased the influence and brightened the prospects of Laud. It seems, however, that even in taking this step to power, he was not unstained with new guilt, for heavy charges were afterwards brought against him of having corrupted the prayers, and altered the coronation oath. He became the king's confidential adviser in church affairs; he wrote his parliamentary speeches, and (as the old phrase went), he *tuned the pulpits*, when money was wanted for the Spanish war. For his devotion he was appointed, in 1626, Bishop of Bath and Wells, and dean of the Chapel Royal; in 1627, a privy-councillor, and, in 1628, Bishop of London. After the assassination of Buckingham, Laud succeeded to his favour with the king; and as he thenceforward plunged recklessly into political affairs, he inherited a double share of unpopularity with the people. He inaugurated his rise to power by a relentless persecution of the Puritans. Leighton, a physician, was among the first victims. For the publication of *Zion's Plea*, he had his nose

slit, his ears cropt, and his forehead branded, besides being publicly whipped. In 1630 he became Chancellor of Oxford; and, by his donations of valuable manuscripts, proved a liberal benefactor to that university. Three years afterwards, he was present at the king's coronation in Scotland, fostering and planning the vicious policy of Charles in regard to a forced religious uniformity; but, at the same time, by his overbearing insolence, creating much of the enmity that afterwards burst upon his head. Returning home, he was presented in the same year to the see of Canterbury; and one of his first acts as primate was the republication of the *Lawful Sunday Sports*. The very appropriate offer of a cardinal's hat, however, at this time, affords one of the indications of the existence of principles stronger than his ambition;—when the offer was made he hesitated, consulted the king, and at last replied, "That somewhat dwelt within him, which would not suffer that, till Rome were other than it is." During his metropolitan visits in 1634 and 1635, he charged all the churchwardens, on pain of being punished by the Star-chamber and High Commission, to place the communion-table at the east end, instead of the middle of the chancel, and to fence it, like a Popish altar, with rails. In 1634 he became one of the Committee of Trade and the King's Revenue, and soon after a commissioner of the Treasury. The decree of the Star-chamber, in 1637, constituting him, along with others, the censor of the press, brought him into great public odium, which was greatly increased when the Nonconformists, Prynne, Burton, and Bastwick, chiefly at his instigation, were mercilessly fined and mangled. Soon after the meeting of the Long Parliament in 1640, he was accused before the House of Commons of high treason, and was committed to the Tower. After three years of harsh confinement, he was tried before the House of Lords; and although the charge was not proven, he was ultimately condemned by a bill of attainder. He was executed on Tower-hill, January 10, 1645, and met his fate with firmness.

That Laud was cruel and intolerant beyond his times, cannot be denied. His diary, which, however, only discloses one side of his character, yet plainly shows that few who sacrificed everything to ambition have had fewer relents. Only once did he give proof of intellectual power in his boasted argument with the Jesuit, Fisher; but all respect for the acuteness which he then displayed is lost in the contempt which we feel for the idle narrator of stupid dreams and paltry prodigies, such as we find him in the record of his daily life. Unchecked by any deep benevolence, or any strength of reason, the love of church uniformity was his master-passion; and to this idol of the fifth century he did not scruple to sacrifice all that his country then possessed of true piety and freedom.

His principal works are:—*Seven Sermons preached on several occasions*, 1651, 8vo; *Short Annotations upon the Life and Death of the Most August King James; Answer to the Remonstrance made by the House of Commons in 1628*; His *Diary* by Wharton in 1694, with six other pieces, and several letters, especially one to Sir Kenelm Digby on his embracing Popery; The second volume of the *Remains of Archbishop Laud, written by himself*, 1700, folio; *Officium Quotidianum, or a Manual of Private Devotions*, 1650, 8vo; *A Summary of Devotion*, 1667, 12mo. About eighteen Letters of Laud to Gerard John Vossius have been printed by Colomesius in his edition of *Vossii Epistolæ*, London, 1690, folio; some others are published at the end of the *Life of Usher*, by Parr, 1686, folio; and a few more have been inserted by Dr Twells in his *Life of Dr Picoche*, prefixed to the theological works of that author, 1645, 2 vols. folio. His biographies include the works of Prynne (London, 1646), Heylyn (London, 1671), John Parker Lawson (London, 1829), Charles Webb le Bas (London, 1836), and of the Rev. J. Baines (London, 1855.) A complete edition of his works is published in the Library of Anglo-Catholic Theology, 6 vols., Oxford, 1847.

Laud.

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LAUDER, SIR THOMAS DICK, Baronet, a popular miscellaneous writer, the only son of Sir Andrew Lauder, was born at Edinburgh in 1784, and succeeded to the baronetcy in 1830. His contributions to Tait's and Blackwood's *Magazines* first brought him into notice. *Lochandhu* and the *Wolf of Badenoch* were written when he was very young. He is the author of a paper on "The Parallel Roads of Glenroy," printed in vol. ix. of the *Transactions of the Royal Society* of Edinburgh, of which he was a member. He also published several sketches of Scottish scenery, under the titles of *Highland Rambles*, *Legendary Tales of the Highlands*, *Tour round the Coasts of Scotland*, and a *Memorial of the Royal Progress in Scotland* in 1842. He was for several years an active and useful secretary of the Board of Scottish Fisheries and of Arts and Manufactures. Sir Thomas died in 1848, at the Grange, near Edinburgh, and was succeeded in his title by his son.

LAUDER, a royal and parliamentary burgh of Scotland, county of Berwick, near the Leader, a tributary of the Tweed, 24 miles S.E. from Edinburgh. The burgh possesses a common of 1700 acres, belonging exclusively to a few privileged burgesses. In the neighbourhood is the mansion of Thirlstane, the seat of the Earl of Lauderdale; and about half a mile from the town stood the old bridge over the Leader, where the favourites of James III. were hanged. Lauder unites with Haddington, Jedburgh, Dunbar, and North Berwick in returning one M.P. Pop. (1851) 1105.

LAUDOHN, GIDEON ERNEST, BARON VON (*Scot.* Loudon), a famous Austrian general of Scottish descent, born at Totzen, in Livonia, in 1716. At a very early age he entered the Russian service, and fought in several battles against the Turks; but obtaining no preferment, he enlisted into the Austrian army, where he was advanced in quick succession to the rank of captain, major, and lieutenant-colonel. In the Seven Years' War, which was begun in 1756 against Frederick the Great, he so signalized himself as to receive within a year the rank of major-general, and within three years he became commander-in-chief. Of these honours he proved himself highly worthy by his victories at Hochkirk in 1758, at Kunnersdorff in 1759, and at Landshut and Glatz in 1760. Peace was proclaimed in 1763; and to the title of Baron, which Laudohn then received, were added, in 1766, the dignity of aulic councillor, and in 1778 the high office of field-marshal of the empire. In the war with the Turks he was again victorious at Dubicza, Novi, and Grandisca. For the capture of Belgrade, in 1789, he was made Knight of the Order of Maria Theresa. Laudohn died of a fever in 1790.

LAUENBURG, DUCHY OF. See DENMARK.

LAUNCESTON (anciently *Dunneheved*), a municipal and parliamentary burgh of England, county of Cornwall, stands on a hill rising from the banks of the Attery, an affluent of the Tamar, 213 miles W.S.W. from London. The parish church is built of curiously carved blocks of granite. Launceston, till recently, was considered the capital of Cornwall, and was the seat of the two county assizes; but these were both removed to Bodmin, the one in 1716, the other in 1838. It returns one M.P. Market-days, Wednesday and Saturday. Launceston was anciently surrounded by a wall, of which there are still some remains. More interesting, however, are the ruins of an old castle, the grounds of which are tastefully laid out as pleasure-grounds. Pop. of parliamentary burgh, 6005; pop. of municipal burgh, 3397.

LAURA was the name given to a collection of separate cells in a wilderness, differing from the monastery, or building in which the monks all lived together. In the laura each monk had his own cell provided for himself, and lived alone during five days of the week, his only food being dates and bread and water. On the remaining two days

the inmates of the lauras took the sacrament, and supped on broth in common. The origin of the name is obscure. The most celebrated lauras mentioned in ecclesiastical history were in Palestine; as the laura of St Euthymus, four or five leagues distant from Jerusalem; the laura of St Saba, near the Brook Kedron; and the laura of the Towers, near the River Jordan.

LAURENCEKIRK, a burgh of barony of Scotland, Kincardineshire, on the Aberdeen Railway, 30 miles S.W. of Aberdeen. It is famous for its manufacture of snuff-boxes, the hinges of which are almost invisible. Beattie the poet was born here, 5th December 1735. Pop. (1851) 1611.

LAURENTUM, an ancient town of Latium, situate between Ostia and Lavinium, about 16 miles from Rome. It derived its name from a grove of laurels with which it was surrounded. Virgil describes it as the residence of King Latinus, and capital of Latium, when Æneas landed on the shores of Italy. With the growth of Lavinium, however, it seems to have fallen into decay; and Ostia, as the port of Rome, seems to have deprived it of its trading importance. Pliny the younger, and Commodus had both villas at Laurentum, although its marshes, whence the Romans derived wild boars for the table, must have rendered it exceedingly unhealthy. The *Ager Laurens* was the general term for the district, the limits of which, with the precise site of the town itself, are now difficult to determine.

LAURIA, a town of Naples, province of Basilicata, situate on the side of a steep hill, 7 miles S.S.E. of Lagonegro. It is divided into an upper and lower town, and has two parish churches, two convents, and several woollen factories. In the vicinity are numerous vineyards. Pop. about 9000.

LAURVIK, a seaport-town of S.E. Norway, in the district of Jarlsberg, situate at the head of a short fiord, into which the Laagen Elv debouches a little to the S.E. of the town. The best Norway iron is manufactured here; a considerable trade is carried on in timber and fish. About half a mile S. of the town, on the W. side of the fiord, is Frederiksværn, a station of the Norwegian fleet, and the seat of a naval academy. Pop. of Laurvik, 3600.

LAUSANNE (Latin *Lausanium*; Italian *Losanna*), a city of Switzerland, the capital of the canton of Vaud, stands on the lower slopes of the Mount Jorat, on the northern shore of the Lake of Geneva. As it is built on three distinct eminences and the intervening gorges, its streets are steep and irregular, and few of its houses are built on the same level. One of the ravines is spanned by a lofty bridge, called the Pont Pichard. The principal edifice is the cathedral, founded in the tenth, and finished in the thirteenth century. For the beauty of its interior, it surpasses all the churches in Switzerland. It is crowned by a lofty tower and a spire 200 feet high, and contains the tombs of Amadeus VIII., Duke of Savoy, and Bernard de Menthon, founder of the Hospice of the Great St Bernard. John Kemble, the famous actor, was also buried here. From the terrace of the cathedral a fine view of the Lake of Geneva and the vicinity is obtained. On a higher platform, behind the cathedral, stands the castle, a massive square building, with turrets at the angles. It was formerly the residence of the bishops of Lausanne, but is now the council-house of the canton. The other public buildings are the church of St Francis, a college, a cantonal museum, containing many curiosities, natural and antiquarian, a theatre, prison, penitentiary, post-office, and normal school. The manufactures of Lausanne are few, comprising only cotton and woollen cloths, leather, paper, and jewellery. There is little trade; and foreigners resort to the city chiefly on account of its cheap education and the beauty of the surrounding scenery. Haller, Tissot, and Voltaire resided here. Here Gibbon wrote the latter half of his *History*, in a house which, under its present

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name of the Hotel Gibbon, is one of the notorieties of the city. At Ouchy, the port of Lausanne, Byron composed his "Prisoner of Chillon." Between this port and other towns on the Lake of Geneva, steamboats ply regularly. Pop. 17,108.

LAVAL, a town of France, capital of the department of Mayenne, is situate on the Mayenne, a tributary of the Loire, 187 miles W. by S. of Paris by railway. It stands on a declivity on the W. side of the river, which is here crossed by two bridges, connecting the proper town with a large suburb. The streets of the town are narrow, steep, crooked, and dirty. The houses are almost all built of wood, in the old French style, each storey jutting out beyond the one underneath, thus rendering the streets dark and gloomy. Laval proper is inclosed by old walls, now in a state of decay. The suburb on the opposite side of the river is of recent date, and is laid out on a regular plan, having wide and regular streets. This faubourg forms a third of the entire town, and is the residence of the better class of the inhabitants. The village of Avenières also adjoins the town, and may be considered as another suburb. It contains a fine old church in the Norman style, erected in the year 1040. The principal edifices of Laval belong to the middle ages. An old castle of the twelfth century, now used as a gaol, stands on the right bank of the river, near the old bridge; it was formerly held by the Counts of Laval and Trémouille. The cathedral, the church of St Vénérand, and two hospitals, are nearly of the same age as the castle, and are worthy of attention as curious specimens of Gothic architecture. The linen hall is a large and handsome building of recent date. Ambrose Paré, the father of French surgery, was born here in 1509; and a statue to his memory has been erected in the Place de l'Hotel de Ville. Laval may now be considered as wholly a manufacturing town, its staple articles being linens and ticking, for which it has long been famous. Besides these, however, it also manufactures cotton, flannels, soap, and leather, and possesses a considerable trade in wine, brandy, and marble. The town is the see of a bishop, and contains a tribunal of first instance and a chamber of commerce.

Laval probably owes its origin to a castle built here in the earlier part of the middle ages, to protect the surrounding country from the inroads of the Bretons. This fortress was destroyed by the Northmen in the ninth century, but was afterwards rebuilt and possessed by the Laval family for many years, until it fell into the hands of the English under Lord Talbot in 1466. Next year, however, it was recovered by the French, and the castle returned to its former owners. In more modern times Laval was the scene of a memorable conflict between the Royalists and Republicans. In 1793 the Vendéans, under Larochejacquelin, carried this town at the point of the bayonet, and then marching against the Republicans under Lechelle, routed them at a place called Les Croix de Bataille, a little distance S. of Laval. Pop. (1851) 17,538.

LAVATER, JOHANN CASPAR, the "Fénélon of Germany," as he is very frequently styled by his German admirers, was born in 1741 at Zürich, where his father was a physician. In his youth he was a timid, solitary child, sensitive and thoughtful; but his shrinking nature was often roused to heroism when he was called to stand forth as a champion in domestic troubles, or in exposing wrongs at school. In early youth he dedicated himself to the church, and Goethe has characterized him as one of the few "fortunate men whose outward vocation perfectly harmonizes with the inner one, and whose earliest culture, coinciding in all points with their subsequent pursuits, gives a natural development to their faculties." In 1762 he entered on the duties of the ministry, and in the two following years travelled in Germany along with Fuseli the painter, and studied theology under Spalding; but it may be easily un-

derstood how a mind so observant should learn theology more from instinct in his contact with men than by analytic criticism from books or lectures. In 1764 he returned to preach in his native town, where he was appointed preacher, first of the Orphan House, and afterwards of the Petrus Kirche, and this latter duty he continued to discharge till his death.

It was as a preacher and a poet that he first became known to fame, and it is needless to try to sever the two vocations, as his preaching often soared into poetry, and his poetry seldom rose above the level of his preaching. His *Swiss Songs* and *Hymns*, and his *Peeps into Eternity* (*Aussichten in die Ewigkeit*), were the first of a series of works, in which he was almost as voluminous as Luther, and which may be taken as the types of all his productions, either purely literary, or more strictly religious. With Hamann (the Magus of the North), Claudius, and Jung-Stilling, he was one of a small band who struggled to revive Christianity as a personal faith on a historical and living, in contrast with a mythical and passionless, Saviour. In his pulpit he was listened to by thousands, his correspondence extended to all Europe, and when he went out of doors, the people of Zürich kissed him in the streets. In the poetic field he had greater rivals. Klopstock and Cramer were then in the height of their fame, and his poems were too purely an imitation of the former. Like Klopstock, Lavater wrote a *Messiah* (1780), the Messiah of Martha or common life, as Hamann called it, in opposition to that of Mary or unearthly sublimity. In the lower range of sentiment, Lavater's Sacred Songs have found a securer resting-place in the world. His own spiritual life, however, was too restless and passionate to write long-lived or widely popular hymns; and in sober moments, his songs, whether patriotic or religious, seem far too rhetorical and over-drawn. His *Peeps into Eternity* are peculiarly characteristic, and throw a strange light on the earnestness with which afterwards, as a physiognomist, he gazed on human faces. The leading principle of the book is the dependence of the celestial state on the education and pursuits of this world; and with this he constructs a fantastic but startling anthropology of a celestial kingdom, "in which the day-labourer will be as indispensable as the king." For himself, he writes to the friend to whom he dedicates the book, he had chosen the pursuit of teaching the children to sing songs in heaven. Unlike Swedenborg, however, Lavater put forth his theory as a conjecture, not as the product of celestial vision. This work was followed by the *Pontius Pilatus oder die Bibel in Kleinem* (4 vols., 1782-1785), another picture of the lights and shades of humanity; *Die Handbibliothek für Freunde* (24 vols., 1790); his *Diary*, 1771-1773; and his *Nathanael*, dedicated to Goethe, as a "Nathanael whose hour had not yet come."

Previously to this, however (in 1775-78), there had appeared his *Physiognomic Fragments*, a profusely illustrated book in four quarto volumes, and published at L.15. It was the result of many years' close observation, and has since been issued in almost every form in all the languages of Europe. Its publication created everywhere a profound sensation. Admiration, contempt, resentment, and fear were cherished towards the author. The discoverer of the new science was everywhere flattered or pilloried; and in many places, where the study of human character from the face became an epidemic, the people went masked through the streets. Musæus and Lichtenberg assailed him with ridicule, but their arrows glanced harmless from the broad shield of Goethe. The principle of the study is at once true and false. Lavater's great error consisted in attempting to elevate it to the dignity of science (see Kant's *Anthropology*), but this is easily pardonable, when we remember how securely and felicitously he handled the most obscure facts on which he built his theory. In stating his method he studi-

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Lavater.

ously lets it be seen that he founded his conclusions on the total impression of the face; and he is anxious to discriminate his *own* science from the science of Pathognomic, or the outward expression of occasional passions. It cannot be denied that many of his observations show the keenest sagacity, and it is equally true that his delineations are given, not in irony, but in the profoundest love for everything human.

In his declining years, physiognomy itself gave place to even wilder and more objectionable pursuits in the mind of Lavater. From the dreams of his childhood he had believed firmly in the sensible manifestation of supernatural powers, and, still a child in his old age, he gave the most ample credence to the stories of exorcism of devils and miracles by animal magnetism, which were then current all over Europe. Of whatever extravagance he was guilty, and it was greatly exaggerated, his defence is noble, that with his finger on a truth, he was not ashamed to confess where he had learned it, and that it was treason to Christianity itself to reject a true fact merely because it was known and attested by Mesmer, Socinus, Rousseau, Spinoza, or Cagliostro. It is characteristic of the man, and undoubtedly redounds to his credit, that in the religious world he was accused of all heresies, from Atheism to Crypto-Jesuitism, because he dared to acknowledge the truth that was in most, while in the inner intolerance of his own faith he rejected the falsehood that infected all.

His friendship with Goethe is one of the most affecting episodes of literary history. In 1773 they had begun to correspond, and soon after the two friends met at Frankfurt. They travelled together with all the glee of children escaped from school, and in Goethe's autobiography we have an amusing sketch of a journey from Coblenz to Neuwied with Lavater and Basedow:—

“Prophete rechts; prophete links;
Das Weltkind in der Mittel.”

“He is the best, greatest, wisest, sincerest (*innigst*) of all mortal and immortal men that I know,” wrote Goethe soon afterwards. “He is the flower of humanity, the best of the best,” he wrote again, after having visited Lavater in Zürich. Their friendship continued till the publication of *Pontius Pilate*, when Goethe recoiled from the picture which his friend had drawn of the no-Christian, as he confessed himself to be. From that hour the poet's affection was changed into Julian hatred, never to be appeased. In the summer of 1797 Goethe was in Zürich, and walked often in the Peterplatz before Lavater's door. They did not, however, meet. Lavater visited the hotel, and, as a pledge of friendship, wrote his name upon the room door, but this appeal to their former intimacy was in vain.

With all the Swiss love of freedom, Lavater hailed the French Revolution. After the death of the king, however, his admiration was changed into horror, and in the pulpit

he declaimed against the French party with a zeal which cost him a quick and summary banishment. Surrounded with bayonets and dragoons, he quietly allowed himself to be hurried off, saying, with a smile, that “he had never travelled with such pomp before.” The popular indignation however, took fire at the outrage, and he was soon after permitted to return. On the 26th September 1799, Massena took Zürich, and Lavater received his death-wound on the streets while protecting a poor woman from assault, and ministering bread and wine to the soldiers. The grenadier who shot him was, according to Jung-Stilling, a Swiss, who knew the fatal power with which Lavater had denounced the tyranny of revolution. Lavater is said to have recognized the man, but in his verses of forgiveness he did not divulge his name. He died 2d January 1801.

A good selection of his voluminous works has been edited by Orelli. His Life has been written by Gessner, and more recently by F. W. Bodemann, Gotha, 1856.

LAVAUUR, a town of France, capital of a cognominal arrondissement in the department of Tarn, stands on the left bank of the Agout, here crossed by a handsome bridge, 25 miles S.W. of Alby. In the thirteenth century it was a stronghold of the Albigenses, but was taken in 1211, after a vigorous resistance, by Simon de Montfort, who massacred the inhabitants without distinction of age or sex. Lavaur has a communal college, public library, and 7113 inhabitants, chiefly employed in the manufacture of silk serge, hosiery, cotton yarn, and leather. It is the entrepôt for the silks of Upper Languedoc.

LAVENDER. See BOTANY, *Nat. Ord.*, 163; and PERFUMERY.

LAVENHAM, or LANHAM, a market-town of England, county of Suffolk, on a branch of the Bret, 16 miles W.N.W. of Ipswich, and 62 miles from London. It consists of several streets, with a spacious market-place, having a stone cross in the centre. The parish church is a handsome edifice, with a spire 142 feet high, and having the timber ceiling and several of the pews richly carved. Lavenham was formerly noted for its manufacture of woollen cloth, which subsequently gave way to that of hempen goods, but now its manufactures are unimportant. Market-day, Tuesday. Pop. of parish (1851) 1811.

LAVINIUM, an ancient city of Latium, founded by Æneas in honour of his wife Lavinia, between Laurentum and Ardea. At first it retained its importance, probably as a religious centre, in opposition to the claims of Alba, but it sunk after the fall of that city. Although on friendly terms, it seems, along with Laurentum, to have retained a certain measure of independence. In the time of Trajan, under the name of Lauro-Lavinium, it united with Laurentum, and flourished for a few years.

LAVOISIER, ANTOINE LAURENT. See SIXTH DISSECTATION, § 605.

LAVORO, TERRA DI. See TERRA DI LAVORO.

Lavaur
||
Lavoro.

L A W.

PART I.—INTRODUCTORY.

Law. I. Law, as the etymology of the words used to denote it in almost all languages shows, is something *laid* down, or established. The word, in its rudimentary sense, denoted such modes of dealing and rules of conduct as, in early times, convenience suggested and usage established among men. Long after these modes and rules obtained a general recognition on account of their convenience, there were no regular means of enforcing them; they were observed partly to avoid trials of strength, and partly because their utility disposed men to combine to enforce them. Contentions, accordingly, frequently arose, both in regard to matters within their provisions and without them. When these disturbed society, its sovereign, or his functionaries, interfered to adjust the claims of the disputants. In the judgment between them a rule already adopted by the good sense of the people was recognised, or a new one was laid down, and would thenceforth be taken for the expression of the sovereign's will on the matter to which it referred,—the people would incline to observe it in their subsequent dealings, and expect the sovereign to follow it on future occasions. By and by, to prevent the necessity of constantly interfering to quell such contentions, the sovereign would prescribe general rules applicable to a variety of cases, and threaten to punish whoever failed to observe them. The name of law would now be given to these with a fuller meaning than when it denominated rules of usage. By a law would now be understood a rule of action, prescribed to and enforced upon the people by their sovereign; and this may be said to be the strict and original sense of a law. Many such laws, however, must have existed, and have lost much of the arbitrariness which their origin was calculated to stamp upon them before the compound idea of law became complete in men's minds.

Significations of the term law: its rudimentary and primary senses. A law, then, in its original and strict sense, is a rule of action contained in a command of a sovereign, addressed to, and enforced upon, his subjects. Four distinct ideas are brought together by this definition:—1, That of a will as the source of the law; 2, That of a command; 3, That of the authority from which it proceeds; and, 4, That of the beings to whom it is given, as capable of obeying or disobeying it. Other two are incidentally involved in it:—1, That of the end for which the law is given; and, 2, That of the uniformity of conduct resulting from obedience to it. When a law is said to be a *rule*, the attributes of permanency and universality are ascribed to it. It is a command addressed to *all*, or to *whole classes*, in the state. It is a standing order of society.

Ideas connoted by its definition in its primary sense. The applicability of the penalties, which the giver of the law has expressed the intention to inflict on those who disobey it, constitutes its proper sanction. The sanction is essential to the law; and it is plain that, in order to its having a sanction, the power of its giver must exceed that of those to whom it is addressed. The nature of the authority essential to giving the character of law to the commands of a superior is not so clear. The most precise idea that can be given of it is, that it is such as that of one who is habitually obeyed from whatever cause. The relation of a parent and child is of the same kind as must subsist between a superior and inferior, in order that the commands of the former may be laws. In that relation obedience is the general rule; the child has so often yielded, it thinks not of resisting. It is through the habit of obedience on the part of the people that, in long-established communities, the sovereign's unquestionable authority makes up for his want of superior

power, which must always reside with the people themselves.

Law. So far of the conception of a law. It is an expression of will, in the form of a command, sanctioned by applicable penalties, proceeding from a competent authority, prescribing to free agents a rule of action for a particular end, and resulting, generally, in a uniform line of conduct on the part of those to whom it is given.

The word law was probably first used as a concrete general term to denote all the laws emanating from a particular source; and in this sense it is still used, as in the phrases, "English law," "Roman law." Thus used, it denotes the expression of the whole will of a sovereign power respecting his subjects, so far as it is capable of being, and intended to be, enforced. By a more comprehensive generalization than the preceding it acquired its general abstract signification, and was brought to denote what is common to all laws, emanating from whatever source. In its definition, at this stage, are connoted all the ideas involved in the concrete from which it has been derived.

It remains briefly to explain the derived senses of the term. In its definition in any of these it will be found that the ideas connoted by its primary definition are involved imperfectly, or (some of them) not at all, or in a fuller or more perfect sense. It will also be found that, when employed in any of its transitive meanings, it is always accompanied by some adjective, or words indicative of the source, subject, or character of the rule which it is used to denominate, and so far expository of the generalization by which its use in that sense has been brought about: of this the phrases, "Natural law," "Revealed law," "The law of Nature," "The law of God," are examples. Law without addition is still law in its primary sense. It is obvious that, in that sense, when set forth in general terms, there is nothing to prevent law existing among any intelligent beings between whom the relation of superior and inferior may be established. Thus, "the revealed law"—the expressed will of God prescribing rules of conduct to man under the sanction of divine punishments—is law without addition wherever it is declared, its definition connoting, at their fullest, all the ideas involved in law. On whatever matters this law is declared, it is a rule superior to all others. The ten commandments, and other rules to be found in Scripture, constitute the revealed law in Christian countries. When the phrase, "The Moral law," is used to denote these commandments, it is of course part of the revealed law. Some, indeed, claim divine authority for the moral law,—meaning thereby a body of doctrine as to conduct, derived from conscience, assumed to be the representative of Deity in the heart of man. If "the Revealed law" is law in its highest perfection, "International law" is law in its rudimentary form. It denotes the rules of the relationships of states established by convenience and usage, but enforced by no regular sanction, and which are observed to avoid war, and because their utility disposes states to combine to enforce them.

So far, it is apparent, the term has not travelled far from its original meaning. The next stage of transition, however, is more remarkable. "The law of Reason," or "the law of Nature," is a rule of conduct established by reason. Its ostensible foundations are a knowledge of human nature and certain first principles, as that men should be just, truthful, and humane; and it consists of such rules as philosophers have thereon founded, and have

Law. declared to be universally binding on men. They call them law, because they are rules, as they say, prescribed by reason, under the sanction of immediate feelings of self-disapprobation and of certain remote disadvantages to those who transgress them, which, indeed, reason cannot inflict as penalties, but which it predicts will certainly follow the transgression of the rules. They thus generalize the term to the extent of admitting into its definition certain ideas, not the same, but akin to those connoted by its original definition. Reason may be more properly said to recommend than to prescribe its rules to man. It has ample authority, but wants power; and, though advice given in the tone of authority comes closely up in idea to command, it is only by courtesy that reason can be said to prescribe rules which it cannot enforce. And though its rules are not without a sort of sanction, yet their giver is neither directly nor indirectly the inflictor of the penalties. Lastly, the rules of reason are not dictated by one will to another; but, whatever force they have, they owe to being approved by the reason of him to whom they are addressed.

Natural laws. By a wider generalization than in the case just discussed, all save one of the ideas connoted in the primary definition came, if not to be excluded from, at least to be allowed to enter only implicitly into, the sense of the term. This is the generalization by which it was brought to denote propositions setting forth uniformities obtaining among natural phenomena. When the term law is used, as in the phrase, "The law of gravitation," to denote such an invariable relation of things as that bodies attract each other by a force proportional to their masses directly, and to the squares of the distances between them inversely, what ideas does it involve in common with the same term used to denote a statute of the realm? *Prima facie*, it is a name given to a statement of fact,—to the formula expressing an invariable relation existing between bodies, involving only the idea of uniformity in common with the concrete from which it was derived. The rationale of this transition is discoverable in the history of science, and the transition itself was less violent than might at first sight appear. Referring the invariable relations of natural phenomena to the Ruler of the universe as the establisher of them, the proposition expressing any one of them, and the fiat by which it was established, are seen to be identical with a change of mood.

Laws in this sense are called natural laws, either ultimate, derivative, or empirical. Ultimate natural laws are those simple uniformities obtaining among phenomena, and arrived at after a sufficient induction; and which cannot be, or as yet have not been, resolved into other and more general uniformities. Such is the law of gravitation. Derivative natural laws depend upon, and are resolvable into, one or more uniformities, which themselves are simple and fundamental. Such is the law of the planetary motions. Empirical laws are derivative natural laws of unknown derivation. Such is the curious numerical relation subsisting between the respective distances of the planets from the sun.

Confusions in the use of the term law. II. The phrases "natural law" and "the law of nature" are perfect equivalents in the sense of science, it not being intended, however, to convey that there is a single simple uniformity to which all natural laws are referable. While their scientific use is thus settled, great confusion exists in their use in writings on law. While some employ them as equivalents, others put them in opposition. By natural laws, some mean those which were observed by men in an imaginary state of existence preceding the establishment of society; while others mean those which, by their constitution, men observe even in society. Some, again, call the "law of reason" "the law of nature;" while others, regarding natural laws as being imposed upon things by the reason of God, and one with the law imposed by reason upon man, give the phrase so wide a meaning as to include under

it both "the law of reason" and natural law in the sense of science.

Law. "To come to the law of nature," says Hooker (*Eccles. Polity*, The law of book i.), "albeit thereby we sometimes mean that manner of nature and working which God has set for each created thing to keep; yet, forasmuch as those things are termed most properly natural agents which keep the law of their kind unwittingly, as the heavens and elements of the world, which 'can do no otherwise than they do;' and forasmuch as are given unto intellectual natures the name of *voluntary agents*, that so we may distinguish them from the other, expedient it will be that we sever the law of nature observed by the one from that which the other is tied unto." And again, in explanation of the nonconformance of voluntary agents to the "law of nature" to which they are tied:—"See we not plainly that the obedience of creatures unto the law of nature is the stay of the whole world? Notwithstanding, with nature it sometimes cometh to pass as with art. Let Phidias have rude and obstinate stuff to carve, though his art be that it should, his work will lack that beauty which otherwise, in fitter matter, it might have had. He that striketh an instrument with skill, may cause, notwithstanding, a very unpleasant sound, if the string whereon he striketh chance to be incapable of harmony. In the matter whereof natural things consist much of it is sometimes such as will by no means yield to receive that impression which were best and most perfect." Here the law of nature is divided into two parts, according to the division of natural subjects into intelligent and unintelligent; and while each of these divisions is separately spoken of as the law of nature relative to its subject, they are jointly so denominated when said to be the stay of the whole world. Montesquieu (*Spirit of Laws*, b. i., c. 1) has fallen into the same confusion in language; and both writers agree in charging a defect upon nature in respect of man's nonobservance of "the law of nature," meaning thereby the law imposed upon him by reason.

The difficulty, however, vanishes if we keep in view the different senses of the term law; and notice how, upon human actions, there may be a superimposition of law upon law in different senses. Natural laws may be predicable of them, and, at the same time, and arising out of their constitutional order, they may partly be determined by law in its primary sense, and partly by rules recommended by reason. From the nature of human beings, which is social, and from the natural conditions of their association, sprung government and laws; from their nature also, which is rational, disposing them to acts of generalization and reflection, government and law became the subjects of criticism which evolved the law of reason. Thus, the institutions of the state and of reason grew organically out of the constitution of human beings and society; and it is only when this is lost sight of that the mind gets bewildered by the apparent antithesis between them and the laws of nature. Keeping this in view, it appears how men, while conforming to their constitutional order, may infringe that established by the state, and, at any time, recommended by reason; and this just that the constitutional order to which the others are subordinate may be preserved. The recommendations of reason sometimes proceed from wrong thinking and false views, and fail because they are related to an unrealizable ideal of human perfection; and, again, because reason's ideal is transitory, ever attending, though by reflection projected in advance of, experience—a light at the ship's bow, and not a beacon to steer by. It is only when reason interrogates nature before admonishing man that its rules can be conformed to.

Before concluding this section, notice must be taken of **Positive law.** the use of the phrase "positive law." It has been employed in different senses by legists and men of science; by many of the former to denote law of human institution

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by many of the latter to signify natural law. It would be convenient, were there no room for ambiguity, to use it here in the sense of the legists; but, as this cannot be done, it is intended to reject the phrase altogether.

The leading divisions of law: first division.

III. The first division of the law of a state is into two portions—the enacted or written, and the unwritten, common, or customary law. The written, or statute law, is the whole expressed will of the supreme power, establishing and regulating the relations of its subjects; and includes all the laws at any time promulgated by the supreme power, so far as not amended or repealed. The common, or customary law, is that which has grown up with popular usages and customs, and taken shape in the decisions of judges. Being unenacted, it falls short of the full idea of law. Civil equity is a part of the law formed from usages and decisions, but differs from the common law, properly so called, sometimes in its subjects, and more frequently in its modes of procedure and relief.

Civil law.

The statute and common law together compose the law of the state—comprising the whole body of rules by which it is constituted and governed. This has sometimes been called its civil law, which, in this sense, comprises an important portion of what is commonly called international law—viz., those express rules which determine the relations of the members of the state to those of other states. The name of civil law is, however, more frequently given to that portion of the whole law which relates to the constitution of the subject's rights of person and property.

Second division.

The second division of the law of a state is into parts corresponding to the social relations which it governs. 1. The *Constitutional Laws* relate to the supreme authority, the legislature, and the higher public functionaries, and determine the most essential privileges of the subjects. Such in Great Britain are, among others, the Magna Charta, the Habeas Corpus, and the Reform Act of 1832. 2. The *Official Laws* relate to the public service, whose different departments, civil, military, naval, and fiscal, they establish and regulate; they secure the public peace, morals, religion, and health, authorize public works, and determine the manner of their execution. 3. The *Civil Laws* determine the subject's rights of person and property; the regulations and pre-requisites by which they are established, and the manner of administering the laws respecting them. 4. The *Criminal Laws* define and prohibit offences against the state and the exercise of public authority; and against the lives, persons, and property of the subjects. They determine the means of preventing such offences, and the administration of the law respecting them. 5. *Municipal, Police, or Local Law*, is only in part a law of the state in the sense of being prescribed by the supreme authority. It includes some general laws relating to the public peace, and special laws relating to the management of local affairs vested in commissions; but chiefly consists of local laws, established on authority delegated by the state,—as bye-laws enacted by burgh magistrates.

Laws create rights and obligations.

All the rules and institutions of the law of a state are, directly or indirectly, limitations and definitions of the powers of action of its subjects. It commands certain actions to be always done under circumstances which it defines; and it forbids others to be done under any circumstances. The powers of action which it assigns to and vests in particular persons are their *rights*. It follows, from the nature of the case, that rights are powers legally vested in persons over their own or others' persons, or over things to obtain services from them,—meaning by a service, whatever tends to gratify a desire. And to rights correspond obligations. The law, in assigning a power to one, necessarily lays all others under the obligation not to interfere with its exercise; and an act in violation of this obligation is a *wrong*. Wrongs, more briefly, are violations of rights.

Corresponding to rights and wrongs are the legal conceptions of right and wrong. Whatever is conformable to law is *right*, and whatever is contrary to it is *wrong*. These Rights and words have other meanings, which, to prevent confusion, wrongs,—must here be indicated. Rights, in the critical doctrine of right and law, are those powers which *ought to be* vested by law in persons conformably to the rule of perfect benevolence; and wrongs are violations of such rights. Whatever is agreeable to the rule of perfect benevolence is *right*, and whatever is contrary to it is *wrong*. It will be seen that rights established by law may differ from those which, according to the critical doctrine, ought to be established; that what is right in law may be wrong according to that doctrine, and *vice versa*.

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IV. The fulness of the idea of law has not been reached The growth of law. by the whole of any system of laws now administered; but in the progress of civilization, the tendency everywhere is towards its realization. Law is, and has always been, in a state of growth and development. History is clear that in the infancy of society men had no idea of regulating their relations on general or uniform principles, and that they knew no rules except such as their natural interconnection established,—a rude approach towards justice between equals; for the rest, the arbitrary rule of power over weakness. In the progress of society, the tendency everywhere has been to widen the dominion of justice and contract that of brute force. In considering this progress, it is to be kept in view that rules of human action are due to the contact and clashing of men with men. The closer men are pressed together by circumstances the brisker is their action on one another, and the more rapid the adjustment of their relationships. The inhabitants of cities soon feel keenly the necessity of rules for their relations, and of combined action for enforcing them. Cities, accordingly, are the centres of all that is denominated by civilization, as the name indicates; they are, *ex facie*, the birthplaces and nurseries of civility, urbanity, politeness. Among rural populations, from the causes which develope rules of conduct operating in a wider sphere with less intensity, and therefore with less rapidity, the progress is naturally slow, and is mainly effected by influences flowing over from the towns. From a similar cause the progress is slow in the society of nations, and is seen to be accelerated as commerce and improved means of communication bring nations more closely together, and increase the number and weight of their common interests.

The causes of the progress and growth of law are partly to be sought for in the earliest stages of society, regarding which there exists no satisfactory information. In an attempt to explicate them, however, valuable assistance may be derived from various sources. Among these are,—1. The descriptions of early societies in various degrees of savagery which have at different times been given by intelligent observers. 2. Observation of what takes place in the intercourse of nations,—nations forming a society which, from its imperfect organization, and attempts to have laws without a proper sanction, and also in having its origin rather in the necessities than inclinations of its members, resembles all communities in their early stages. 3. The history of law itself, in its different branches, revealing its sources and modes of growth. 4. Observation of what takes place in any new society formed in consequence of the necessities of its members. 5. Observation of the development and tendencies of individuals. From the two last might be deduced the natural conditions of human association, and it was the exclusive consideration of these that led to the fiction of a social compact as the basis of civil society.

This fiction proceeded on the hypothesis, which, however, The origin is wholly without foundation, that society was formed by of society. the aggregation of solitary beings. Society obviously commences in the family: the society of parents into which every human being is born, and in which are to be

Law. found the germs of that subordination to, and recognition of authority which are essential to the civil state; the state where the government is patriarchal is indeed the direct prolongation of the family. As the banyan tends to surround itself with a forest of its own offshoots, so the family tends to multiply families around it, till it becomes the centre of a tribe. The feelings of kindred which connect families in tribes tend, though with a feebleness of force, to bind tribes together in nations; and the sentiment of humanity, which is the feeling of kindred refined and diffused, tends, though more feebly still, to unite nations in the great society of mankind. While such is the gradual development, the specialities of the composition of families and of tribes vary, of course, with race, geographical position, climate, and the prevailing religious beliefs.

The bases of law.

Starting from this very general account of the origin of civil society, it is designed (1), briefly to refer the various bases of law to the necessities of human life to which they correspond; and then (2), to indicate the processes by which laws grew up to protect the various civil institutions. The principal bases of law are four in number:—1, Personal safety; 2, Marriage; 3, Property; 4, Government, each of which must receive brief consideration.

1. *Personal safety* is the first condition of the enjoyment of existence, for without it man's life would be miserable. The provisions of nature for securing personal safety are the instinct of self-preservation, resentment, and sympathy; by the last of which men are led to combine to secure their common safety.

2. *Marriage*.—The origin of the institution of marriage is to be found in the instinctive attraction of the sexes. It corresponds to a leading necessity of human life, which would be intolerable without the orderly gratification of the appetites and affections which it affords. Nature's provisions for the perpetuation of the marriage union are twofold:—The causes which produce it continuing to operate for a considerable time tend to prolong it; and, on the birth of children, the co-operation necessary for their preservation develops the domestic affections which tend to maintain it after these causes have ceased to operate. In virtue of these provisions, the rudest savages, it is found, have given a degree of permanency to this union. The necessity of regulating and guarding it must have been early felt; and it is probable that around it laws first began to grow. In some localities the old names for law and marriage are interchangeable. The German word *ehe*, for example, which now means marriage, meant at one stage of the language also, "law" in general; and *ae*, the corresponding word in Anglo-Saxon, signifies simply "law." While the institution of marriage is to be everywhere found, as the necessity of human life to which it corresponds is everywhere felt, marked differences appear in the modes of regulating it adopted in different localities. These are due, in every case, to local peculiarities; as to the proportion of males to females,—depending on race, climate, and popular pursuits; and the degree of civil equality among the people—depending on the manner in which the governing persons acquired and maintain their authority.

3. *Property*.—The institution of property is ultimately referable to the fact of men's wants being such as the earth does not spontaneously satisfy. Were the objects of desire constantly in lavish excess of the demand for them, the idea of property would never have been formed. Whether men's wants were ever so few and simple as that the earth spontaneously supplied them, is more than is known; but it is certain that the condition was very early reached in which the number of human desires, and the difficulty of satisfying them, gave rise to the conception of property in all sorts of objects. The circumstances which give rise to property necessitate the formation of rules for its acquisition and alienation; and owing to the leading realities of social life

being the same everywhere, the same facts are everywhere held to have the qualities of giving rise to property,—viz., pre-occupancy, labour, donation, succession, and contract. The main necessities of life, for example, being procurable only by labour; and there being no motive to labour without security in the enjoyment of its fruits, it is a condition of existence, as well as of social intercourse, that a man shall have the exclusive enjoyment of the fruits of his labour.

4. *Government*.—Government is the condition of security in the enjoyments of marriage and property. Its institution is traceable to different immediate causes in different localities. Those causes only need here be noticed which are of universal operation, viz.,—1. The desire of security. 2. The experience of the advantages of association for mutual protection and aid, acquired in various forms of association for common objects; as for the purposes of the chase and war, or for mutual protection against domestic enemies. 3. The experience of the necessity of subordination to the leadership of one, in order to reaping the full advantages of association. These having produced a disposition towards government, it required only the rise of a leader, pre-eminent for valour or sagacity, or arrogating authority to himself on grounds connected with the prevailing religious beliefs, to compose the fluent elements of society into the solid fabric of the state.

It would be useless to speculate on the anti-governmental condition of men, if it did not throw light on the causes which lead to government. That condition still crops out, ever and anon, in periods of revolution, and in badly governed countries, in efforts of various kinds to attain the security which the governing persons fail to afford. The recent history of California illustrates it. Every man is at first the defender of his own person and property. When outrages become frequent, a sense of insecurity leads men to combine for the common safety. Offenders are at first punished informally, and without moderation. But when the combination for the public safety acquires solidity, there is less fear of outrage and less precipitation in punishment. Accused persons are admitted to trial, and the execution of punishment is open, formal, and deliberate. Lynch law in America indicates one species of combination which, in a rude state of society, preceded the exercise of the judicial and executive functions of government. A less rude form of association to supplement state-action in affording security may be seen in the societies in England for the prosecution of offenders, many going unpunished for the want of public prosecutors.

Sovereignty is long established before the legislative functions of government are exercised. Its first institutions and acts are those necessary for its own security. Its first agency is for putting down disturbances; its next for preventing them. First, it angrily punishes both parties to disturbances; next, it inquires into the grounds of disputes, and punishes those in the wrong. Lastly, it anticipates disputes by prescribing general rules.

Any view of the order of evolution of law would be false that excluded the fact of a simultaneous progress in the regulation of the various social relations; but, so far as we know, the order has been that which, on *à priori* considerations, might be expected. Laws may be said to have first grown round the marriage relation, next round the institution of property; and, lastly, to have referred to the punishment of offences against the person. The right of private vengeance, and the insatiable character of revenge, long prevented the adoption of rules regarding punishments.

The sources whence laws grew up may be said to be six in number:—1, Equity; 2, Decisions; 3, Contracts; 4, Customs; 5, The will of the sovereign power; and, 6, Opinion acting critically on existing laws. As all laws are referable to nature as their ultimate source, so they acquire their full force only by concurrence with the will of the sovereign.

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From the sovereign's will law springs forth full-armed; from equity, decisions, contracts, customs, it grows up slowly, and organically.

Equity.

1. *The Birth of Law*.—It is impossible to conceive a time when men did not interfere with each other's enjoyments. But as social relations grew in complexity, and the objects of desire multiplied, desires must have more frequently conflicted, and unsocial tendencies increased in number and strength. With unsocial tendencies, however, must have grown up the means of repressing them; otherwise men would not have held together.

When a stronger interfered with a weaker, there was nothing for the latter but to succumb and bide an opportunity of vengeance. In relationships between the stronger and weaker, therefore, the rule was generally the arbitrary will of the stronger. The case was different between equals—resentment directly checking the tendency to interference. When a difference arose between equals, there being no government, or one too weak to interfere, there was nothing for it but to settle the matter amicably, or fight. Hence arose from their intercourse two methods of settling differences—the combat and the reference; the former finally passing into the legal contest, and in many countries becoming the ally of the latter in trial by jury. The combat—at first an off-hand contest, prompted by conflicting desires—was afterwards converted into a formal encounter, and recognised by various nations as a civil means of determining rights. This law of brute force was latterly accepted as an equitable means of settling disputes, from a false view of the dispensation of Providence, and up to a period not very remote, indeed, survived in our own country. Prudence, however, must soon have established among equals a preference in favour of arbitration as a means of settling most questions. The reference would especially be resorted to on minor questions between persons so nearly equal as to make a recourse to force undesirable to them both. On such questions arising, they would first endeavour to come to terms by private discussion; failing in which an amicable settlement would be obtained by a reference to an impartial person of eminence in the community, whose decision, if approved of, would have influence on future cases of a similar description. As the design here is chiefly to trace the spontaneous evolution of law, our remarks will be confined to the case of an amicable settlement by reference to an arbiter; but they will apply, with a slight change, to the decision of disputes by self-constituted umpires, so far as their decision bears on the growth of law.

The disposition of an impartial person judging between equals is equity, which, in other words, is the disposition to act on the best conceptions of right and wrong. Of these the most advanced public opinion, resting on the ripest common experience of what is convenient, is from the first the practical standard; and the desire to act agreeably to this opinion is of the essence of the equitable disposition. Security for the arbiter's endeavouring to conform to this standard lies in his desire of approbation; but, in fact, in order to his decision being final, influencing future cases, and thus (as we shall see) passing a principle into law, it must approve itself to the unprejudiced persons cognisant of it, and therefore proceed, pretty nearly, on conceptions of right and wrong drawn from the common experience. These conceptions are the guides of equity, and interpreters of its maxims; and are generated by experience of, and reflection on, the realities of things, and what is convenient to them. Without attempting an explication of the manner of their development, it may be indicated in a single case. The maxim of equity, "Give every man his own," must be interpreted before being acted upon. The disposition to act on it may be complete, and yet there be different opinions as to what should be done depend-

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ing on conceptions of the requisites to make a thing "a man's own." The conceptions of these requisites depend on the experience which gave rise to the idea of property in things being vested in particular persons as their rights; and this draws back to certain facts which prudence and convenience concur in leading men to hold to be qualified to give rise to property. A man will defend, as his own, the fruits of his labour, the ground which he has pre-occupied, and what has been given to him as a gift. Hence, among equals, labour, pre-occupancy, donation, will at once be recognised as qualified to give titles to property. Experience, then, produces notions of right and wrong, by establishing certain associations between facts and titles to enjoyments. Interpreted by these, the maxim now reads, "Give every man the fruits of his labour; the ground which he has preoccupied; what he has got by gift;" and so on; and it must have been by a generalization from these particular precepts that the maxim was evolved. It is right to give effect to these qualities of facts, and wrong to prevent their operation. So, generally, experience produces associations of legal qualities and facts; and these are modified by reflection. Their trueness to the realities of things will, of course, depend on the fulness of the experience of these realities, and the accuracy of the reflection upon them. The lessons of experience may be misinterpreted by reflection. Experience may demonstrate, for instance, the evils of immoderate revenge, and yet reflection, misled by the idea of proportionality between injuries and punishments, may produce a rude and false conception of what the proportion between them should be, as in the rule "An eye for an eye," "A tooth for a tooth." Before the associations of legal qualities with facts are fixed by law, they are likely to be loose, and different in different minds according to the peculiarities of individual experience; and we are now to consider how they become fixed in the law.

On the reference being made, and the facts founded on by the disputants being laid before the arbiter, his judgment rises into his mind according to the qualities which he associates with the facts. If the dispute respects the property in a thing, he declares it to be his whom the facts favour. Recalling what was said of his disposition, it appears that his judgment, so far as it is what it aims at being, is a verdict of unprejudiced public opinion, and measure of the people's progress in the formation of conceptions of propriety. When, hereafter, it shall be said that equity entered into the rule of a relationship, let it be understood that the rule rested on an equitable judgment, and realized the conception of right respecting the relationship entertained when it was formed.

2. The discussion on the bearing of decisions on law has been anticipated for the principal part, and, for the rest, may best be introduced in showing their bearing on contracts and customs. The origin of law in decisions of arbiters, or of judges interfering to settle disputes, is proved by the fact that the earliest names of law, of right, and of justice, are words signifying decisions or judgments. The progress is easily traceable in the language of the Greeks. *Θέμις* (from *τῆμι*) their old name for law, signified a decision, decree, or rule, laid down in a particular case. Personifying this idea of law, the Greeks regarded *Themis* as a goddess attached to Zeus, who was conceived of as a judge (and not as a law-maker), issuing *θεμύρες* to settle particular disputes. *Δίκη* and *θέμις* at first rarely denoted justice as an abstract conception, but special claims of right; *δίκη*, which came to signify "natural right," is from the same root as *dico*, and at first signified a decision. The other Greek names for law, *λόγος* (*λέω*, to speak), and *νόμος* (*νέμω*, to distribute), point also to decisions as the origin of law. (Grote's *History of Greece*, vol. ii., p. 111.)

3. In proportion to the necessity for arbitration would be the desire to rule relationships by contract; and the desire to

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prevent differences by ruling relationships by contract would be greater the more they tended to give birth to differences. It is on this principle that the order of the evolution of law is to be explained.

In transactions between equals entered into by contract appeared a farther approach to law. What they agreed upon was the rule of their relationship. What was once satisfactorily the rule of a relationship was repeated. If frequently repeated, it became a custom or usage. Transactions not provided for by contract fell to be decided *ex post facto*; to these a rule previously acted upon, if there was such, would probably be applied. Where there was no clear rule that could be held to be implied, or that could be agreed upon *ex post facto*, recourse was had to other means of settling the matter in dispute, as to a reference to an impartial person, whose decision again influenced future cases, and the terms of future contracts. It is thus the terms of decisions and of contracts grow into customs.

It is worth while considering how far equity enters into rules of law derived from contracts whose terms are privately arranged. Where the contractors put themselves into the position of an impartial person, and settle terms from his stand-point, equity directly enters into the terms. The only case for consideration is where their conceptions of right being modelled on their desires, are made to differ from those commonly entertained, and the rule is reached by a process of double position. Here either the rule of the contract is what bystanders approve of, or it is not; only in the former case will it be adopted and passed into custom. Contracts from this source, then, must involve equity to pass into law. That they should often do so, appears from the consideration, that, in advancing to a rule the contractors are forced to recognise equality of advantage as the ideal rule of the contract.

Customs.

4. We have seen how rules of relationships, formed in the intercourse of equals, pass by arbitration and contract into customs. In early times only equals would submit their differences to the decision of neutral persons, or consent to rule their relationships by contract, because only equals had a common interest in obtaining the settlement of their differences by these means. Equity then entered into all decisions and contracts in early times, and thence into the rules of custom derived from them, and into law, so far as it is an organic growth from the constitution and circumstances of a people. A distinction, already hinted at, must here be brought out between customs due to the intercourse of equals and those due to the intercourse of superiors and inferiors. It was said that from the latter arose no principles for imitation by equals in forming relationships between themselves. It may now be said, that the latter class of customs are permissive and not regulating, and are only for consideration here as illustrating the condition of things from which law gradually rescues men. All the customs that shock one's sense of justice and humanity,—the exposition of infants—the powers of a Roman father over his children,—are remnants of the condition anterior to law, and respect acts and relationships not rescued from that condition, because they lay without the sphere of operation of the causes by which law has everywhere been developed. They are proofs of the slowness of men to extend, by sympathy, to others benefits which, by force, they assert for themselves. That sympathy is among the causes which develop law is certain; but it is only by concurrence with a highly stimulated selfishness that it recovers the relations of superiors and inferiors from arbitrary rule. It is owing to this that law has been, almost everywhere, developed in some degree differently with respect to different classes of the same people. When it was first asserted in cities that law ought to be equal for all, the claim was advanced only for the classes of freemen, who were themselves the parties making it; at first

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περιουκοι, peregrini, immigrants, helots, and slaves of every kind, were disallowed equal privileges. Women everywhere, to this day, are without equal rights. One class of our own people reserve the right of being tried by their peers. But it is in the intercourse of nations, who form as yet a rude society, that the truth of the proposition is most noticeable. War is the moderator of the consciences of states. Where success is easy the sense of justice rarely impedes their aggressive tendencies; where it is difficult, their morality shuts them up to non-interference. In Europe, where the states are interested in maintaining the balance of power, an approach to equity is made in the regulation of the relations of states great and small; but outside Europe,—in India, China, Japan, Africa,—the European states practise the morality of superiors, and gratify every desire, however iniquitous, in satisfying which they are not led into conflict with one another. So that the area over which an approach to law has been made in the intercourse of nations is conterminous with that over which the sense of a common interest extends and identifies the security of individual states with that of all. With the widening of that area, and the increasing intensity of that sense, international law will spread and grow. Nowhere is law, local or international, other than that sense, by its direct or indirect operation, constitutes it. How sympathy of itself fails to effect the recovery of the relations of superiors and inferiors from arbitrariness falls not to be explained here. Whoever appreciates what Adam Smith (*Moral Sentiments*, part i., sect. 3) has written of the dependence of sympathy on imagination, will have no difficulty in understanding the failure.

It is in virtue of public opinion, originating in the experience of what is conducive to the common good, and mostly supported by the authority of religion, that before government is fairly established, and exercises its judicial and executive functions, customs acquire for the rules which they embody some degree of the force and generality of law. One of the first institutions of government is an agency to give effect to the rules of custom,—functionaries appointed by the sovereign to act as judges taking the place of self-constituted umpires and arbiters. Custom, when its rules are thus administered and enforced by the sovereign, is the highest rudimentary form of law. "It is surprising," says Mr James Mill, "to what an extent over the surface of the whole globe law has, in all ages, remained in that state of imperfect existence, if, indeed, with any propriety it can be called a state of existence. In every part of Asia, in all ages, law has remained in that state of existence or non-existence. In Europe, where, at a pretty early period, it became the practice to record in writing the proceedings of the judges, the natural propensity of referring to the past as a rule for the present, begat in time a species of obligation of being directed by the examples which had already been set. This created a uniformity and certainty which, however imperfect, afforded something better than the arbitrary proceedings of Asiatic judges. Yet this was a benefit which had a dreadful alloy. A body, not of law, but of decisions, out of which, on each particular occasion, a law for that particular occasion, as out of the crude ore, was to be smelted, hammered, and wire-drawn, was the natural material out of which to manufacture a system of chicane A system of laws so constructed becomes an instrument of conservation of the barbarous customs and ideas of the times in which they were engendered; and infests society with the evils of an age which it has left behind." Of this effect of custom there will be occasion to write hereafter. By a change of view, however, it is possible to admire instead of deploring that provision of nature by which custom is made to preserve the popular experience, and thus to accumulate the materials which the legislator must employ in attempting

Custom, the highest rudimentary form of law.

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The sovereign power.

to perfect the laws of his country. Even under the legislator's superintendence, law is apt to grow up somewhat rankly; and it is well that its growth is so far independent of his care.

5. As civilization advances, and government becomes firmly established, the sovereign's judicial function is exchanged for the legislative. He enacts new laws, sometimes arbitrarily, sometimes on a principle, and amends and repeals old rules; or rears up a homogeneous and systematic body of law out of the mass of popular usages. Thereafter this body receives successive differentiations and accretions as popular habits change with new occupations. When the sovereign perceives that his interests and those of the people are identical, and that the subordination of individual interests to those of the community is the principle on which legislation ought to proceed, he makes laws in greater consistency with one another; seeks to anticipate cases, and to make law popular and effective by giving it publicity and certainty. The consideration, however, of the bearings of sovereignty on the growth of law must be postponed until the action of opinion on law has been farther considered.

Opinion acting critically on existing laws.

6. While in the growth of law custom drew in and hugged the accidents of the soil round the rules of equity, opinion, based on these, but expanding with improving conceptions, tended to loosen and remove them. It was at first wavering and divided; then men of speculative minds, orators, poets, philosophers, and ministers of religion, gave it precision and definite direction by their sentiments and doctrines. They refined the rude juridical notions of early times, and gave rise to the maxims which, by approving themselves to popular experience, established the despotism of opinion which met many necessities for which neither laws, nor the actual power of each individual, could provide. Whoever violated the rules approved of by the people, had to dread their resentment. Weakness became formidable to power by being armed with the sympathies of mankind.

The manner in which opinion grew up with law, beginning to grow with its first germs, but rapidly shooting in advance of them, and thereafter always maintaining itself in the advance, may be traced in the history of morality; and as the action of morality on law is among the chief of the influences determining its development, it is particularly important that their relation should be understood.

The *rational* of the action of opinion on law is, of itself, simple enough. Experience at once generated rules of action and doctrines respecting conduct; and while use and wont, and convenience, preserved the rules, reflection and riper experience changed the doctrines. The new doctrines, on being propagated, produced popular dispositions, or fell in with them, by which they were in turn passed into rules of law, realized and fixed in the rear of advancing opinion.

Law and morality.

The conceptions of right and wrong struck out in the intercourse of equals were the foundations of opinions respecting conduct. As the highest and lowest in society had their co-equals, all partook of instruction in the same principles—in the same school—if in different forms. We have seen that these conceptions rested on associations of legal qualities with facts, induced by experience of the imprudence and inconvenience of preventing these facts operating to vest enjoyments in particular persons. The conceptions of enjoyments, as properly vested in particular persons, are conceptions of *rights*, and the same experience gave birth to these, and to prudential motives to respect *rights*. It thus at once gave birth to morality and law. As these prudential motives, and the rules for the regulation of the desires based on them, which afterwards passed into moral rules, existed from the first only relatively to the realities, however rude, of law, morality was at the first dependent on, if not coincident with, law. The argument, from another

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point of view, of Dr Whewell (*Elements of Morality*, vol. i., pp. 36, 37), on the dependence of morality on law, when carried back to the limit, establishes the same position. Its truth, however, rests not wholly on an abstract argument; it is an historical fact, that it is some time before morality and law are discriminated from one another. Mr Grote points out the fact that in the Homeric poems only the germ of the distinction between morality and law can be detected. In a note (vol. ii., p. 110), he quotes Nägelsbach (*Homeric Theologie Abschn. V.*, p. 23), as giving "a just and well-sustained view of the Homeric ethics," which is to the effect that it is their characteristic stand-point "that the spheres of legal right, morality, and religiosity are not as yet at all disengaged from each other—so that a man, for example, could be just without being godly—but exist together in undeveloped unity." They are only conceived of as distinct when, by the advance of morality, law stands out by itself as a rule distinct from moral and religious duty. This advance is due to the fact of law realizing and fixing conceptions of right in rules of custom; while morality freely changes and amplifies them, by reflection, on a riper experience than gave them birth. On the advance taking place, it arose from the necessity of moral rules receiving their interpretation from legal dispositions that morality divided into two portions,—the one steady, relative to law, and creating a disposition to conform to it; the other vague, and contemplating better or more convenient dispositions of things than those realized by law. It thus became in a twofold sense the auxiliary of law, aiding at once in enforcing and improving it. It is by the reciprocal influence of morality (and other advanced forms of opinion) and law that the stability of the social progress is secured, opinion steadied, and excessive inequalities in the development of the classes of society prevented. While critical morality tends to improve popular conceptions, and thus to change the rules of law (or custom), the latter react on the former. Opinion in a state of fluidity, in the front of experience, is constantly washing the law, in its centre, of the impurities of the soil; but these in turn enter into opinion, and tone and colour it. A most noticeable instance of this is pointed out by Adam Smith in the Influence of Custom on the opinions of Plato and Aristotle regarding the exposition of infants. In the view of this reaction must be noticed the tendency to finality in morals as affecting the progress of law. The temporary effect of assigning absoluteness to moral dogmas is to increase their authority; but the final effect is to disqualify them for carrying on the improvement of law. Critical morality in the relative form, with the greatest happiness on the whole of society for its standard of right, continues to be the auxiliary and guide of law, because it aims at no more than investigating rules, the true lessons of experience, which, on being discovered, the instincts of men compel them to practise. And, in fact, since circumstances and convenience determine law, and law interprets the rules of morality, it is impossible to make them absolute or universal except in point of form. Even the moral rules,—Be just, pure, humane,—which, being drawn from the essential institutions of society, exist in the morality of every country in the same terms, can have no greater generality than the corresponding rules of law. Purity in Turkey is consistent with polygamy, and humanity in America with the institution of slavery.

Reciprocal influence of law on morality and morality on law.

The relation of other forms of advanced opinion to the growth of law is, for a large part, the same as we have above indicated as subsisting between morality and law, the progress effected resulting from the mutual actions of opinion on law, and law on opinion. When the progress has been carried on up to a certain point, the action of advanced opinion becomes more immediate in its effects, taking place on law itself, instead of on popular dispositions. This is when the legislative functions of government

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All law, in the long run, due to the same causes that develop customary law.

Political liberty.

to operate. But, in fact, their action has merely been changed from the direct to the indirect; for it is only by the concurrence of the individual wills of the people that the sovereign possesses his authority; and this concurrence cannot be long maintained except by a line of action on his part conformable to popular dispositions. The changes in law, then, produced by legislative action are not to be regarded as being arbitrary, but as being, in the long run, the effect of the indirect action of the same causes as develop customary law. The truth of this proposition is sufficiently obvious where the sovereignty of the people is asserted, and they possess political liberty. The distribution of political power and authority among the various classes of the people, which is the practical security for good government in which political liberty consists, facilitates their action on the course of legislation. Though, in consideration of the degree to which this security must be relaxed in order to good government, Montesquieu has made political liberty to consist in the opinion of the people that they are free; yet this opinion itself, supposing that there is nothing more, keeps alive a spirit inimical to state action contrary to their interests, and secures the harmony here contended for. But it is immaterial to the proposition what is the character of the political system, or the source of the concurrence on which the sovereign's authority depends.

The argument, on the general case, of M. Comte (*Philos. Positive*, vol. iv., p. 336, *et seq.*), is conclusive, and is briefly as follows:—That the political régime is, in the long run, in conformity with the corresponding state of civilization, arises from the fact, that the disturbances manifest in the one are due to equivalent derangements in the other. The theory that attributes to the legislator the permanent power of infringing this harmony supposes him to be armed with a sufficient authority. But authority, like every other social power, is necessarily constituted by a corresponding assent, spontaneous or deliberate, explicit or implicit, of various individual wills, resolved, from certain preparatory convictions, to concur in a common action, of which it is first the organ and then the regulator. Thus, authority is really derived from concurrence, and not concurrence from authority, setting aside the necessary reaction, so that no great power can arise except from the strongly preponderating dispositions of the society in which it is established; and when there are no strongly preponderating popular dispositions, such social powers as exist are necessarily feeble and languid; and this correspondence is the more irresistible the more extensive the society is. That the reaction of the political system—the effect of political institutions and events—on the general system of civilization, is great, must be admitted; but it must not be exaggerated so as to be placed before the primary action. In a scientific view, it is to the concurrence of the two that the fundamental agreement of the social organism is due. To the same effect writes Savigny, in maintaining such an organic connection between law and the character of the people as subsists between the latter and their language and manners. This connection, he says, is manifested in the progress of the times. “For law, as for language, there is no moment of absolute cessation; it is subject to the same movement and development as every other popular tendency; and this very development remains under the same law of in-

ward necessity as in its earliest stages. Law grows with the growth, and strengthens with the strength of the people, and finally dies away as the nation loses its nationality. The sum, therefore, of this theory is, that all law is originally formed in the manner in which, in ordinary, but not quite correct language, customary law is said to have been formed; that is, it is first developed by custom and popular faith, next by jurisprudence; everywhere, therefore, by internal silently operating powers, not by the arbitrary will of a lawgiver.”

Law.

V. Long after men in civil society had experimentally wrought out codes of local law and morality in a degree supplanting the rule of brute force, the intercourse of states was wholly faithless, lawless, and unfriendly. Whoever was not of a state was its enemy, and, by coming within its confines, exposed himself to be enslaved, and his property to be confiscated. This in times when there were between them no special grounds of quarrel. In war they ravaged and depopulated each other's countries without mercy, massacring alike armed men and helpless women and children, or sparing them only to make them slaves. Such were the relations of states in Greece in the times of its greatest philosophers; and such the principles on which Rome for seven centuries made war on the world. The ancient moralists, homologating the savage traditions of their times, enforced them by precepts. Nor is this to be wondered at, looking to the effect of custom on opinion alluded to in tracing the growth of local law. Every universal result and exercise of brute force the world agrees to hold legitimate: witness the—at one time—universal institution of slavery. Nor is this agreement anywhere broken up, till it becomes the common interest, through the balance of forces, that the rule of force be abandoned. The balance of forces, however produced and maintained, is the first condition of the birth and growth of law. This is especially clear of international law. It originated in the intercourse of states so nearly equal in power as to be formidable to one another, and between whom, in time, grew up the habit of mutual forbearance. They adopted rules of their various relations on the principle of reciprocity, from the mutual convenience of comity and fear of retaliation. These, embodied in mutual contracts, tacit or express, passed into customs, and were supported, in time, by public opinion amongst nations, resting on the sense of their utility, and the respect for usage. Then this opinion tended to cause the principles of these rules to be applied to the relations of the great and small states; while, concurrently, the mutual jealousies of the great powers tended to widen the area of the common interest, by, in effect, producing a balance of forces between themselves and the less. These principles, being thus diffused, were next made more just and humane, by circumstances which added new common interests to those which the fear of their respective forces, and the perception of the advantages of comity, at first created between states. Among these were the institution of the order of knighthood; the crusades, which united men of many nations in a common action; and chiefly the Romish Church, whose ministers spread over Europe, imbued with the spirit of Roman justice, and sustained by the authority of the pontiffs, tempered the rude disorders of the European family. Then criticism, to which Grotius first gave shape, applying the principles of local justice to the relations of states, helped on the cause of humanity by giving definite direction to the sentiments of the leading minds in various nations, and by, finally, through a succession of teachers, transfusing the better classes of all societies with enlightened views of the duties of nations. But there was another developing cause. The relations of nations were, from the first, affected by the experience of the advantages of commercial intercourse. It is to commerce mainly that we owe the steady increase of the respect to humanity, perceptible

Growth of international law.

Law.

in their intercourse in modern times. By bringing men of various nations face to face, it destroys their local prejudices and antipathies, and while widening their sympathies, it directs them by manifest and sensible interests. Its effects, as a developing cause of international law, have already been so powerful, that an augury of what they may hereafter be, though reasonable, would to most appear fanciful. It is rapidly assimilating the mercantile codes of all the nations in the world, and stripping war of its ugliest features one by one: it is daily making clearer the demonstration, that the interests of nations press them from all sides not to go to war at all, and is thereby undermining the military system. That it will henceforth still more powerfully and rapidly conduce to the harmonious adjustment of international relations, is guaranteed by the steady progress of nations in the industrial arts, and by the inventions that, facilitating their inter-communication, increase its advantages. Wherever a nation has a market, it has an interest that order and prosperity should there prevail. As the subjects of various nations are brought into close and constant intercourse, as the number and weight of their common interests are increased, and as, through the press, their literatures are freely interchanged, they will more and more nearly approach towards sameness of views and sentiments; and be led by that instinct which impels men everywhere to what is advantageous, to concur in desiring that disputes between nations should be adjusted on the principles of equity. The more just and definite rules of international law become, the more obvious will be the advantage of observing them and the mischievousness of war, and it will be seen that the alternative should be dreadful to justify the resort to so clumsy, ineffectual, and horrible an expedient. Public opinion in the various states, resting on the manifest utility and justice of observing the equal rules of international law, will then bind down governments to respect them; while, being everywhere guided by the same leading ideas and principles, it will be distinctly pronounced, and secure a preponderance of sympathy and active assistance from nations to any state whose rights are violated.

While such are the principal developing causes of international law, the inequalities of development of the various nations composing the society of mankind, the varieties of their forms of government, and the mutual jealousies of the governing persons in societies of different constitutions, are among the principal of the causes which have retarded it. But in the growth of international, as of local law, the principles of human nature are seen steadily operating towards the just and harmonious settlement of the relations of men. Hereafter, as hitherto, its progress must be worked out experimentally; and that it will be continued is insured in the great society of mankind, as the progress of civil law is insured within the smaller compass of individual states, by the concurrence of the desires of individuals for happiness, and the common experience that the largest measure of durable good is obtainable only in the way of justice. It is in the view of this security that the scientific truth of the faith, that "all things work together for good" is perceived; for it guarantees that in the long run all might must perish that are exercised prejudicially to the interests of mankind.

Popular tendencies related to law.

VI. In the view of law being everywhere, in the long run, the result of the habitual sentiments of the people, it remains briefly to notice the principal popular tendencies that affect its progress. A tendency, that has almost everywhere been influential, is to conceive one's self out of society in what is called "the state of nature;" and, with the feelings and ideas of society, to consider the faculties of action one would then have. From this sprung the popular conceptions of "natural rights," which, favouring strong desires, and being easily (if vaguely) formed, have powerfully affected politi-

cal systems; to an extent beneficially, by balancing the tendency of sovereigns to arbitrary rule; to an extent also injuriously, by throwing society, in moments of heat, into confusion. The desire of liberty from legal restraints, one of its manifestations, deserves consideration, because its strength depends on errors that may readily be exposed.

Law.
Law and liberty.

"Natural liberty," or the liberty a man would have in the "state of nature," as opposed to what he has in society, is unintelligible in so far as the "state of nature" of man is society. But the idea is, that it is the liberty a man would have in the solitary state, or in a society without laws or government. It appears at first as if a man by relinquishing either of these for a governed society lost a portion of his liberty. But if liberty be defined to be greater or less according to the number of ways in which a man may exercise all his faculties, the number of objects on which he may exercise them, and the extent to which they may be exercised, it is greater in a governed society than in either of the states supposed. However great may be a man's liberty of action in these, he wants, as has well been said, the materials for it. Many of his noblest faculties are exercisable only in a governed society in which others are developed to a degree of activity unattainable in the so-called state of nature. Government and laws subordinating individual to public interests, and prescribing the modes and limits of social activities, establish order and security—the guarantees of human happiness; and while, in a sense, abridging men's liberties, so increase the materials on which the faculties left with them may be exercised as on the whole greatly to enlarge their freedom in the truest sense. The definition of civil liberty which places it in the freedom from legal obligation left, or granted, by the supreme power to its subjects, opens the way to the desire of "natural liberty" as the perfection of freedom. Its true definition destroys that desire. Civil liberty is analogous to what natural

liberty really is. As this consists of freedom of action, uncontrolled save by the wise laws and dispositions of nature by which the harmony and welfare of the world are secured; so that consists in freedom of action, uncontrolled save by such wise and benevolent laws as are necessary for the harmony and welfare of the state. This definition agrees substantially with that given by Sir James Mackintosh (*The Theory of the Laws of Nature and Nations*), when he places liberty in security against wrong. It turns round the tendency from which aspirations after savagery arise, and makes it conduce to the perfection of law and government. The desire for equal laws must here be briefly noticed, from its having acted healthfully on systems of laws. It grew up with the conception of law as designed to secure the public good, and is to be distinguished from the sentimental longing for an equal distribution of the objects of desire among the members of society. It demands security to all in the enjoyment of the fruits of their industry, and that none shall be laid under any obligation with respect to another under which the latter is not put equally with respect to him. The obstacles to the realization of equal laws are,—1, The necessity for government, which requires that the multitude shall always be subordinated to their rulers; and, 2, The selfishness of the governing classes. But supposing laws equalized up to the point consistent with government, they might still fall short of the character which law should have according to the latest conception of it. According to this it is an active force, restricting and directing the various social activities, so as, though in small part, beneficially to determine the character of the social progress. So long as law is determined solely by present convenience, it may fail of securing what is conceived to be its proper end—the permanent welfare of society.

Civil liberty.

Equal laws.

The latest conception of law.

Defects incidental to law from

VII. Preparatory to the inquiry how this latest conception of law is to be realized, it will be well briefly to exhibit the defects incidental to law from its modes of growth, to see of growth.

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tion.

what is the knowledge necessary for their rectification. Law branches out in different directions corresponding to its different sources—common law to popular customs—statute law (immediately) to the will of the sovereign—civil equity to certain defects of statute and common law, which it partly rectifies. The first defects, then, to be noticed are four,—1. Defect of consistency between the principles in its different branches. 2. Defect of cognoscibility due to their number, and their being mostly welded into cases, and the difficulties of ascertaining which of them apply to new cases that occur. 3. Defect of equity. That there should be positive defects of equity in the rules of statute and common law, looking to their later stages, is plain enough, considering how often the sovereign's immediate interests conflict with those of the people, and the limits within which authority may be abused without exciting a corrective popular reaction, and how often circumstances warp the judgments of the most conscientious judges. 4. Defects due to its tenacity in carrying forward into one age the imperfect modes of dealing, and forms of expression peculiar to another. These four everywhere tend to work out their own rectification, by producing obvious intricacy and confusion in the administration of justice, and inconvenience and positive injustice in the regulation of relationships. Accepting its rules as having been equitable when formed, it remains to point out their possible defects as discovered in the progress of experience and opinion. These are two, the one due to over-generality or over-particularity in the definitions of the relationships of which they are the rules; the other due to errors in the guiding conceptions of equity at the date of their formation. Instances of the first defect are to be found in plenty in decisions of courts of equity. The "appeal to God," as a means of testing a suspected person, resting on a misconception of the method of the divine government, is an instance of the second. On the belief that the operation of natural laws was always suspended or altered to shield innocence or detect guilt, the test was reasonable, and rules of evidence applying it equitable. Their unreasonableness was only discovered on the falsity of that belief being ex-

posed. A third defect, akin to this, is due to defect of prevision—a short-sighted policy forming rules that soon work injuriously.

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tion.

It appears, then, that, so far as concerns law related to justice, the knowledge necessary to cure its defects must include,—1, Correct conceptions of the general cases to be provided for, from which the cases to be exempted from the general rules will at once appear; 2, Correct conceptions of the natural relations of persons and things and their tendencies to change. These demonstrate what the associations between facts and rights, and what rights themselves ought to be, and, had they existed, would have prevented the barbarous laws of evidence above alluded to. The knowledge necessary for the perfection of law related to the determination of the phenomena of society, remains to be treated of in the next part of this article. It will be found to include that necessary for the rectification of law related to justice. "In everything that relates to practice," says Lord Bacon, "we must make up our account as to what is in our power, and what not. For, in the former, alteration is allowed, but, in the latter, application merely. The husbandman hath no power over either the nature of the soil or the weather; nor the physician over the natural frame and constitution of the patient or the variety of accidents. But in the cultivation of the mind, and the healing of its disorders, three things come under consideration—the different characters of disposition, the ailments, and the remedies: as also in the treatment of bodily diseases, these three things are brought under our notice—the habit or constitution of the patient, the disease, and the cure. But of these three, the last only is in our power, not so the two first. But we must make no less careful inquiry into those matters which are beyond our power than into those which are within it. For a distinct and accurate knowledge of them must form the basis of a doctrine respecting the remedies, in order that these may be applied more skilfully and successfully." The remarks here made as to the body and mind of a man, and their treatment, apply directly to the frame and constitution of society, and to legislative action upon it.

PART II.—LEGISLATION.

I. It has been ascertained from the study of the growth of law, that, in the long run, both the laws and political system of a people are reflexes of their habitual sentiments, and tend to change as these do. It follows that a scientific knowledge of the tendencies of human nature and society is the only safe basis of legislative action.

The test of
laws.

The assumption, in every speculation on laws, must be, that they ought so to govern men as to secure the greatest good, on the whole, of society. The test of the goodness of laws is their fitness to secure this good. But of this there can be no test, if the phenomena of society are not subject to natural laws. Whether they are, depends on whether the law of causality applies to human actions; for if it does, social phenomena are certainly subject to natural laws, because they wholly result from the concurrence of the actions of individual men.

Universal experience favours the conclusion that the law of causality applies to human actions. 1. If it did not apply, there could neither be universal principles as to the formation of character, nor could we have the idea of character. But we have that idea, and constantly assume that it is possible to foretell the conduct of one whose character and exact situation are known. 2. In threatening punishments to counteract the motives to offences, the assumption is, that between motives, volitions, and actions there exists the relation of cause and effect. 3. Every one is conscious of the force of circumstantial evidence. Evidence of this sort, in courts of justice, consists usually of two parts,—(1.) Evidence that the accused had a sufficient motive to commit the

offence charged on him; (2.) Evidence that he did commit it. The force of the first part is due to the universal conviction that no one does anything without a motive, and that when a man has a motive he acts upon it, unless it be counteracted. The links of the circumstances which make up the second part are supplied by our conviction that certain actions must have followed the mediate actions indicative of purposes that enter into the circumstances. 4. Whoever has to influence another calculates, from his knowledge of the person's character, what inducements are most likely to weigh with him. He appeals "to the avarice of the miser, the honour of the gentleman, the probity of the man of virtue;" and so confesses his practical belief that "motives determine the will as necessarily as acids act upon alkalis" (Abercromby's *Intellectual Powers*). 5. Spontaneous actions are not separated from, but stand in the front of, the general class: they are due either to direct physical causes, or to dispositions of mind towards certain volitions, originating in deliberations at first consciously preceding them, but at length dispensed with as leading to known conclusions. Whatever is true of actions generally, therefore, is true of spontaneous actions.

That the law of causality applies to human actions may be held, then, to be a truth established by universal experience. It is, in fact, "as palpable and universal as that bodies have weight." It follows that the phenomena of society, which result from the concurrence of the actions of individuals, must be ruled by natural laws derived from those of individual life. It is therefore possible, speaking

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tion.

apart from difficulties due to the complexity of social phenomena, for the legislator to obtain scientific guidance in acting on society.

To show how the knowledge which is to yield this guidance is to be obtained, we must briefly inquire into the sciences of human nature and of society. Whoever desires fuller information on these sciences should study the admirable essay of Mr J. S. Mill on the "Logic of the Moral Sciences," *Logic*, vol. ii.; and M. Comte's *Philos. Positive*.

The science
of human
nature.

The science of human nature, as it must be constructed for practical purposes, aims at investigating the laws according to which circumstances affect character and conduct. Owing to the diversities of individual experience, and the fact that every event which happens to a man affects, in some mode or degree, his subsequent mental history, it would be unreasonable to expect that the generalizations men make respecting the feelings or actions of mankind, without reference to the causes which determine them, should be anything but approximate. They are, in fact, of the nature of empirical laws; and unless we have resolved them into the laws of the causes upon which they depend, and ascertained that those causes extend to the cases which we have in view, no reliance can be placed on inferences from them to those cases. The saying, that the old are cautious, is not a scientific truth, but an approximate generalization only; the scientific truth is, that contact with difficulty and danger *tends* to make men cautious. This causal law at once explains the saying, and gives us the limiting principle of our reliance on it. The investigation of such causal laws is the object of the science of human nature. "The science of human nature," says Mr J. S. Mill, "may be said to exist in proportion as those approximate truths which compose a practical knowledge of mankind can be exhibited as corollaries from the universal laws of human nature on which they rest, whereby the proper limits of those approximate truths would be shown, and we should be enabled to deduce others from any new state of circumstances in anticipation of specific experience. . . . Men do not all feel and act alike in the same circumstances; but it is possible to determine what makes one man, in a given position, feel and act in one way, another in another; how any given mode of feeling and conduct, compatible with the general laws (physical and mental) of human nature, has been or may be formed. In other words, mankind have not one universal character, but there exist universal laws of the formation of character. And since it is by these laws, combined with the facts of each particular case, that the whole of the phenomena of human action and feeling are produced, it is upon these that every rational attempt to construct the science of human nature in the concrete, and for practical purposes, must proceed" (*Logic of the Moral Sciences*). The nature of these causal or "ethological" laws, as they have been called by Mr Mill, will now be understood. They must be deduced from the general laws of mind, experimentally investigated by psychology, by supposing sets of circumstances, and then considering what, according to the laws of mind, will be the influence of those circumstances on the formation of character.

The science
of society.

The science of society investigates the laws by which, in the first instance, social phenomena are harmonized, and, in the next, by which they tend to change. Hence its division into two sciences (Social Statics and Social Dynamics), kept distinct for the sake of convenience, but really parts of one, and corresponding to two aspects of the same theory. Social Statics considers the interconnection of the parts of society, and the laws by which they are harmonized; Social Dynamics considers the tendencies of social phenomena to change, and investigates the laws by which one state of society tends to generate another, and by which social effects react on their causes, and determine the nature of the social progress.

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As the causes of social phenomena arise from the composition of the causes of individual phenomena, their laws are derivative from those of psychology and ethology. Hence, however sociological laws may be investigated, it is in their agreement with the laws of psychology and ethology that their verification must be looked for.

The investigation of sociological laws may be conducted on two methods, separately and conjunctly:—1. By deducing social laws from the general laws of mind, and verifying them by deductions from history. 2. By deducing social laws from history, and verifying them by the general laws of mind. M. Comte is of opinion, that the latter method is the only one strictly applicable to sociology. Mr Mill, in assigning importance to the former, admits that a social science formed on that method would be a science of tendencies, and not of positive predictions. "We may be able," he says, "to conclude from the laws of human nature applied to the circumstances of a given state of society, that a particular cause will operate in a certain manner, unless counteracted; but we can never be assured to what extent or amount it will so operate, or affirm with certainty, that it will not be counteracted; because we can seldom know, even approximately, all the agencies which may exist with it, and still less calculate the collective result of so many combined elements. The remark, however, must here be once more repeated, that knowledge insufficient for prediction may be most valuable for guidance. It is not necessary, for the wise conduct of the affairs of society, no more than of any man's private concerns, that we should be able to foresee infallibly the results of what we do. We must seek our objects by means which may, perhaps, be defeated, and take precautions against dangers which possibly may never be realized. The aim of practical politics is to surround the society which is under our superintendence with the greatest possible number of circumstances of which the tendencies are beneficial, and to remove and counteract, as far as practicable, those of which the tendencies are injurious. A knowledge of the tendencies only, though without the power of actually predicting their conjunct result, gives us, to a certain extent, this power." M. Comte, regarding the social science as essentially consisting of generalizations from history, verified by deductions from the laws of human nature, seeks to construct it as a science, not of tendencies, but of positive predictions. If the guidance promised by Mr Mill falls short of the scientific prevision promised by M. Comte, it can be much more easily obtained.

How social
laws are to
be investi-
gated and
verified.

The leading idea of social science, as conceived by M. Comte, is, that society must be regarded as a whole, and singular social facts as strictly inseparable from the whole. There is no doubt that this is the scientific conception of society; but the main difficulties of perfecting social science are connected with this conception. M. Comte is, however, of opinion, that once the leading ideas of the science have been seized, every observation of human nature, and impression from the events of life, will become of value as a sociological indication in aid of the historical method of investigating social laws. He thinks that when men come to make observations on society, with the social theory to guide them to what to observe, the facility afforded by the mutual relation of its various aspects will, in part, compensate for the difficulty caused by that mutual connection,—the inseparableness of the parts from the whole, while rendering observation more difficult, thus providing more means for its prosecution. Mr Mill, however, in anticipation of the arrival of the period when the science will reap the advantages of observations thus conducted, proposes to create several sub-departments of sociological inquiry, and thus to facilitate observation by confining it. The conclusions arrived at in these independent departments must, of course, be less exact, and afford less safe guidance than those of

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tion.

the general science. But, as Mr Mill observes, the exactness of science must give place to practical convenience and utility in the science of society, as in astronomy; and there appears to be no good reason, supposing cases can be found analogous to that of the moon, where the effects, though contributed to by many, are principally due to one or two causes, why, in sociology as in astronomy, there should not be isolated theories, the approximate character of their conclusions not being lost sight of. M. Comte, however, contends that the cases are not analogous, and that in sociology the isolation of effects and their specific causes is strictly inadmissible. Such sub-departments of social science have, notwithstanding, been formed. For instance, political economy is isolated from general social science, and devoted to the investigation of the laws of the creation and distribution of wealth—its approximations resting on the operation of a single law of human nature, that men prefer a greater gain to a smaller. Among the sub-departments thus formed or projected, is political ethology (Mill's *Logic of the Moral Sciences*), the science of the causes which determine the type of character belonging to a people or an age. This science investigates the effects of institutions or social arrangements upon national character and conduct, and thus corresponds immediately to the legislative art.

Political
ethology.

Sociological problems come in one or other of two forms:—1, Given a certain general condition of social circumstances, to determine the effect of a given cause; or, 2, What are the laws which determine the circumstances themselves? Sociology, as a science of tendencies, answers the first, by demonstrating the tendencies of particular causes under assumed conditions of circumstances: when the actual conditions differ from these, the practitioner, recurring to the principles of the science, must endeavour to take the omitted circumstances into account, or to omit the superlative circumstances, as the case may be. It answers the second by investigating the laws by which one state of society generates another. With regard to the first, Mr Mill is of opinion that it would be an error to suppose that, by deduction from the principles of human nature, we could arrive at any great number of propositions which will be true in all societies without exception. "Such a supposition," he says, "would be inconsistent with the eminently modifiable nature of social phenomena, and the multitude and variety of the circumstances by which they are modified—circumstances never the same, or even nearly the same, in too different societies, or in two different periods of the same society. Every cause, as its effects spread through society, comes somewhere in contact with different sets of agencies, and thus has its effects on some of the social phenomena, differently modified; and these differences, by their reaction, produce a difference even in those of the effects which would otherwise have been the same. We can never, therefore, affirm with certainty, that a cause which has a particular tendency in one people or in one age, will have exactly the same tendency in another, without referring back to our premises, and performing over again for the second age or nation that analysis of the whole of its influencing circumstances which we had already performed for the first. The deductive science of society does not lay down a theorem, asserting in one universal manner the effect of any cause; but rather teaches us how to frame the proper theorem for the circumstances of any given case. It does not give us the laws of society in general, but the means of determining the phenomena of any given society from the particular elements or data of that society." The

consideration of the second form of the social problem is less necessary to our purpose than that of the first, and would lead farther into the methods of general social science than is consistent with the limits of this article.

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tion.

It will by this time be seen that the function of sociology is to supply the legislator with general rules and principles for solving particular practical problems; and that there can be no science of law separate from the science of society. When the legislator has to act in any case, he may consult the science as to the consequences of his acting in a given way, or as to the way in which he should act to accomplish a proposed end; as to whether the end proposed is itself practicable and desirable, or as to what end it would be most desirable to accomplish, looking to the good of society. Legislation is the art of applying the middle principles of sociology; and the general rules which it borrows from the science, together with certain art-principles of its own, make up its whole theory.

II. It remains to consider the nature and limits of the modifications of social phenomena producible by legislative measures.

There are here two guiding principles,—1, That events subjected to invariable laws are susceptible of modification in proportion to their complexity; and, 2, That the changes are producible by affecting their intensity and secondary operation, but not their nature or filiation. The postures into which an automaton may be thrown increase in number with the number of its joints, while each joint definitely prescribes a peculiar motion to the portion of the figure in which it is situated, and, in a degree, determines the fashion of all the postures. When there are many joints, an indefinite number of postures are readily producible, while it is vain to attempt to throw the figure into any one for which a single joint would have to yield a motion contrary to its nature. The case of a ship at sea, moving between the points up to which it can be made to sail to the wind, illustrates the same principles. In this, and every case of a combination of causes, the producible modifications are more numerous and easily effected the more numerous the causes are, and the ways in which they may be resolved, so as to vary their joint effect.¹

Coming now to legislative action on the complex phenomena of society, the former principle guarantees its facility, while the latter assigns its limits. It may be stated, in general terms, that it is limited by the sociological laws of harmony and succession; and that, within the limits prescribed by them, it must operate by affecting their intensity and secondary operation. This is no more than is intended by Adam Smith (*Moral Sentiments*, vol. ii., p. 84), when, in terms equally general, he describes the man of system as going on "to establish his plan of government in every point, as if he could arrange the members of a great society as he could arrange chessmen, neglectful that each has a principle of motion of his own." "For the rest," to quote M. Comte (*Philosophie Positive*, vol. iv., p. 404), "having ascertained the existence of general limits of variation peculiar to social phenomena, and especially of the modifications dependent upon systematic political action, and the scientific principle which is to give the character and limits of such modifications; it belongs to the direct development of social science to determine, in each case, the influence and actual reach of this general principle, by a special appreciation of the corresponding situation. It is by such appreciations, made empirically, that those men of genius who have really exercised a great and profound influence on humanity, in any way whatever, have been guided."

The limits
of legisla-
tive action.

¹ Accepting the definition of evil, that it is the result "of the non-adaptation of constitutions to conditions," the consciousness of our power to modify phenomena so as to accommodate constitutions to conditions, within certain limits, must be accepted as the ultimate source of our feeling of responsibility. The legislator's duties and responsibilities unquestionably depend on his having the power to determine the course of social events more happily than they would be determined in the natural progress.

Legisla-
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Looking exclusively to the conditions of the existence, the cohesion, and coherence of society, it is possible to assign a few of the limits beyond which laws cannot, at least with safety or impunity, be pressed or relaxed. (1.) The first of the former class are determined by the conditions under which men live and propagate their kind. Some of the Roman jurists, perceiving that legislation could not be pressed beyond the limits set by these conditions, gave to a rule, based on their observance, the name of *jus naturale*. To this they referred,—1, The right of self-defence; 2, Liberty; 3, Common property in the air, water, &c., as conditions of the existence of individuals; 4, The union of man and woman; 5, The procreation of children; and, 6, Their education as conditions of the existence of the species. It seems to have been the opinion of Ulpian, that the *jus naturale* could not be infringed beyond a certain point without fatal, or, up to that point, without pernicious consequences. The limit might be partially transgressed, as in the institution of slavery; but not safely or consistently with the public welfare. (2.) A second, if less obvious limit is set by the conditions of popular health, mental and physical. Unless the restrictions on the actions of the people, set by the laws, be compatible with the healthful exercise of their physical and mental faculties, these will decay, and the people become stupid, brutish, weak in mind and body, and unfitted for the cultivation of the arts, both of peace and war. A society, governed by such cramping rules, will either decay, or fall before foreign enemies; or the people, throwing off their bonds, will constitute it anew. (3.) A third limit seems to be set by the conditions of popular activity in the directions of agriculture and commerce. The laws must allow to the people such property in land, and in the profits of trade, as will stimulate them to these pursuits. (4.) A fourth limit is set by the conditions of the sovereign's authority. These seem to be three in number,—1, There must be a system of education, disciplining the subject to merge his individual good in that of the state; 2, There must be among the people a feeling of loyalty; and, 3, A feeling of nationality. If the legislator destroys the subject's respect for his authority, or interrupt the process of discipline on which that respect and the love of country depend, he endangers his own power and the state's existence.

The preceding limits are likely to be pressed upon only under despotic governments; those now to be indicated may be approached under any government, and are not so easily assigned. Speaking generally, they are the limits beyond which the law cannot safely be relaxed. No society can hold together without laws, or usages with the force of law, to give reality to the conceptions of morality. The question is, what relations of the subject may, with safety to the state, be left free of legal regulation. The question, in this form, is too broad to be answered. But relations may be specified which cannot safely be left without regulation, and thus the question may be answered indirectly. We said that the laws must permit the union of the sexes; here we say that they must regulate that union by defining marriage, the modes of constituting and dissolving it, and its consequences. We said that the laws must permit the existence of private property; we say here that they must define it, and regulate the modes of its transmission and alienation, and give security, in its enjoyment, to its owners. If Proudhon's doctrine had been realized in France, it would have been a case of the relaxation of law beyond a limit of legislation.

Many limits might be conceived to be set to legislation by the character of the people in different states. In a country where, under a free government, the people are frank, outspoken, and loyal, if not always cautious in their language, the dogmas of the freedom of the press, liberty of conscience, and the sovereignty of the people, set limits to legislation,

which in other countries do not exist. Opposite limits, in fact, would be set to legislation in a country where the people were excitable, visionary, easily led by novel ideas, and lived under a despotism. If in such a country the laws were relaxed to permit the freedom of the press, government and social order might be endangered.

Over-legislation.—The consideration of the limits beyond which the laws ought not to be relaxed is closely allied to the inquiry, What are the relations which ought to be exempted from legal regulation? The answer, in general terms, is, that they are those with which the state cannot beneficially interfere, or which can be regulated with equal or greater advantage by the people themselves. What these are cannot be generally defined. They must be discovered by an appreciation of the whole circumstances of the particular cases, the propriety of interfering with which is questioned; and this appreciation must include the secondary and more remote consequences of instituting laws for these cases. A law designed to eradicate evils due to one relationship being without rule, may, by disturbing others, induce collateral evils which may, on the whole, exceed those it eradicates. Such relationships may be more beneficially regulated by the people themselves than by law, their rules changing with those who enter into them, as in the case of the commercial relation which the free-trade agitation in this country lately relieved from legal restraints. As discovery is made of the relations which may beneficially be freed from state control, the laws will obviously diminish in number. It is in this view that Dugald Stewart observes, that it might easily be shown that the greater part of the political disorders existing among mankind rise from politicians "having trusted too little to the operations of those simple institutions which nature and justice recommend; and, of consequence, that as society advances to its perfection, the number of laws may be expected to diminish instead of increasing, and the science of legislation to be gradually simplified."

The number of laws will also diminish as legislation is freed from empiricism. The empirical procedure makes legislation endless; it demands a measure to meet an evil, and a measure to meet an evil produced by a measure; and so on, till the legislature, restlessly touching society on all sides, increases beyond calculation the complexity of its phenomena, and its own difficulty in acting upon them; and till society, over and above its natural laws, which are few and simple, finds its action restricted by 20,000 statutes and 100 volumes of common law decisions. "Society, a living, growing organism, placed within apparatuses of dead, rigid, mechanical formulas, cannot fail to be hampered and pinched" (Herbert Spencer, *Over-legislation*). It is in view of the evils of much legislation on empirical principles, that Mr Spencer, in his able essay on the subject of this section, maintains that the primary state duty is to protect each individual against others; that to this it should be confined; and that all state action with the view of protecting individuals against themselves must be prejudicial. "Badly," he says, "as government discharges its true duties, any other duties committed to it are likely to be still worse discharged. To guard its subjects against aggression, either individual or national, is a straightforward and tolerably simple matter; to regulate, directly or indirectly, the personal actions of these subjects is an infinitely complicated matter. It is one thing to secure to each man the unhindered power to pursue his own good; it is a widely different thing to pursue the good for him. To do the first efficiently, the state has merely to look on while its citizens act; to forbid unfairness; to adjudicate when called on; and to enforce restitution for injuries. To do the last efficiently, it must become an ubiquitous worker, must know each man's need better than he knows it himself; must, in short, possess superhuman power and intelli-

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gence." That there is much truth in this view might be established on consideration of the official laws which form the bulk of the legislative enactments of our own parliaments. But admitting that empirical politicians do, and must continue to, commit many mistakes in extending state action beyond what is ordinarily conceived to be the sphere of the administration of justice; and that many social relationships ought to be exempted from legal rule; we are far from assenting to the general proposition maintained by Mr Spencer, in the sense in which he maintains it, viz., that "till social requirements are fulfilled in a spontaneous way, they should not be fulfilled at all." The examination of the reasoning on which this doctrine is rested is the more necessary, from its being held to be fundamental by a growing school of politicians.

Mr Spencer's argument, which it is impossible to represent here in full, is briefly as follows:—Legislators, to act beneficially on society, should satisfy its wants in the order of their importance. But "to select out of an immense number of minor wants, physical, intellectual, and moral, felt in different degrees by different classes, and by a total mass, varying in every case, *the want that is most pressing*, is a task which no legislature can accomplish." Therefore legislators can never beneficially interfere to satisfy the minor wants of society; and, therefore, till such wants are satisfied by social vitality, they should not be satisfied at all. If this argument is well founded, legislation should be abandoned in every state advanced in civilization, and in which, of necessity, all the leading wants of society have already been satisfied. But it is not to be admitted that the mischief occasioned by state action arises from its liability to satisfy less social needs before greater. Mr Spencer has, in our opinion, in no instance clearly traced the evil of measures to their satisfying the needs of society out of their order; and, besides, his doctrine on this point appears to rest on grounds far too narrow to support it, viz., "that to effect a neglected thing by artificially employing citizens to do it, is to leave undone some more important thing which they would have been doing." The argument here turns (1.) on the presumed withdrawal from "social vitality" of the few officials needed to accomplish public objects; and, (2.) on the assumption that social vitality always satisfies social needs in the order of their importance. The presumption on the first point surely should be, on his own principles, and considering the comparatively small numbers of public officials, that "the more important thing" will be independently effected by social vitality. On the second point, we object that, supposing the assumption to be strictly correct, it extends to minor social needs, and the order of their satisfaction, through state agencies. The separation of the phenomena of legislation from the general phenomena of society is altogether inadmissible. The protest which Mr Spencer and others have raised against much legislation may have a healthful influence on the disposition at present prevailing in this country to trust to state action principally, or solely, for remedying social evils; but, judging from the facts, there can be no doubt of the vigorous existence of that disposition, and, so far, that the extended state action complained of is but an instance of social effort administering to social desire. But, granting the distinction between the cases of the leading necessities and minor wants of society, by which Mr Spencer meets this objection, to be good, it is untrue that the "minor" desires of society do, in the actual course of things, get satisfied in the order of their strength and of the importance of the wants to which they correspond. The order of actual satisfaction depends, in a secondary degree, upon the relative strength of desires, and, in a primary degree, on the opportunities that occur, or may be created, for their being satisfied. The strongest desire stimulating to activity to produce its opportunity, is satisfied after the weakest that grows up on an opportunity presenting itself.

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In this view, while the social activities in different directions are proportioned to the strength of the desires which induce them, collateral circumstances conspire with them, and make the order of satisfaction different from what it would be if dependent solely on the degrees of activity. Though then it were to be desired in acting on society, that satisfaction should be given to its needs in the order of their importance, it would be strictly impossible always to satisfy them in that order, because of the conspiracy of causes by which the social harmony is constantly secured. But to conclude from this that state action following any other order must, on that account simply, be mischievous, and that such action should therefore, beyond a narrow conception of the sphere of justice, be altogether suspended, seems to be a serious error. On similar premises, a similar conclusion, applicable to family groups, would, in a large measure, arrest systematic efforts at education of every kind, and forbid individuals to mutually assist one another.

So far as the legislator is concerned, justice is the disposition to do whatever the good of society requires to be done; and that this is more than to stand by and see fair play between the subjects in their transactions touching property, and their principal personal relations, is evident from many acts of beneficial legislation that readily suggest themselves. For example, the ravages committed annually by small-pox in this country, and the culpable neglect, or the ignorance, of the laws of self-preservation, which led large classes of the people to omit vaccination, and consequently to endanger their own lives, and those of others, presented a proper conjunction of circumstances for legislative intervention. The law passed relative to that conjunction to save certain sections of the people from the consequences of their own ignorance or recklessness, operated to save others, better informed and more prudent, from danger. It was a simple case of justice; for our personal security ought to be guaranteed as well against the consequences of men's stupidity and folly, as against those of their passions; and laws protecting society, by making the improvidence of individuals penal in certain cases, are really, though not morally, in the same category with criminal laws. The same example furnishes proof that it may be necessary in some cases to satisfy desires out of the order in which they actually manifest themselves. Multitudes omitted to have themselves vaccinated, though in most districts provisions existed for having the operation freely performed. The desire of life, stronger than all others when life is in immediate danger, is one of the weakest in providing for distant contingencies, readily yielding to the aversion to a small exertion for a remote benefit; and the want of laws for the protection of health, measured by it, is accordingly small in periods of popular health. But in providing for this want at such a time, the state satisfies a need which then, indeed, is less than many others, but which becomes the greatest of all, when disease invades the people. In fact, it appears to be one of the leading duties of the legislature to aid the spontaneous action of society in that class of cases in which experience shows that the people are liable to sacrifice their true to their immediate interests. Granted that the mode of solution of all social problems must be experimental; yet the lessons of experience become manifest long before itself becomes painful enough to compel men to reduce them to practice. And although experience will ultimately lead the people to adopt, of their own accord, the rules necessary to be observed under their circumstances, yet surely it is the duty of the legislator to save them from the pains of experience, wherever his foresight enables him to do so, by prescribing these rules to them at once.

"It is," says Burke, "one of the finest problems in legislation, and what has often engaged my thoughts, whilst I followed that profession, 'what the state ought to take upon

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itself to direct by public wisdom, and what it ought to leave, with as little interference as possible, to individual discretion.' Nothing, certainly, can be laid down on the subject that will not admit of exceptions, many permanent, some occasional. But the clearest line of distinction that I could draw, whilst I had my chalk to draw any line, was this,—that the state ought to confine itself to what regards the state, or the creatures of the state, namely, the exterior establishment of its religion; its magistracy; its revenue; its military force by sea and land; the corporations that owe their existence to its fiat; in a word, to every thing that is *truly and properly* public; to the public peace, to the public safety, to the public order, to the public prosperity. In its preventive police, it ought to be sparing of its effects, and to employ means, rather few, infrequent, and strong, than many and frequent, and, of course (as they multiply their puny politic race, and dwindle), small and feeble. Statesmen who know themselves will, with the dignity which belongs to wisdom, proceed only in this, their superior orb and first mover of their duty, steadily, vigilantly, severely, courageously: whatever remains will, in a manner, provide for itself. But as they descend from a state to a province, from a province to a parish, and from a parish to a private house, they go on accelerated in their fall. *They cannot do the lower duty; and in proportion as they try it, they will certainly fail in the higher.* They ought to know the different departments of things; what belongs to laws, and what manners alone can regulate. To these, great politicians can give a leaning, but they cannot give a law. Our legislature has fallen into this fault, as well as other governments. All have fallen into it more or less." Even the limits here, vaguely enough defined, are, or at least some of them, too wide and general. The fact is, no general limits are here assignable. As already stated, the duty of the state must be pronounced on from case to case, on an appreciation of the whole circumstances of cases, and calculation of the probable effects on society of state interference with them.

III. *Jurisprudence and Legislation.*—We must here, for the sake of completeness, give a brief account of the different senses in which the terms Legislation and Jurisprudence have been employed by different writers, and indicate the divisions of our subject which remain for discussion.

The words jurisprudence and legislation have been employed in many senses. Legislation at one time denoted the science explaining the principles from which law ought to be universally derived, and their application to particular countries; recently it has been employed to represent that portion of the law of a state directly derived from the supreme authority in its legislative capacity; and in this sense it is distinguished in France from jurisprudence, or that portion of the law derived from judicial decisions. In the former sense, again, legislation, or the science of law as it ought to be, has been distinguished from jurisprudence, or

the knowledge of law as it is (Austin's *Province of Jurisprudence*). On the other hand, jurisprudence, or *jus* (Whewell's *Elements of Morality*), has, both of old and recently, been employed to signify the doctrine of rights and obligations, or the science of law; and legislation to signify the art of applying the principles of the science of law (Bentham, *Fragment on Government*). In this latter sense, jurisprudence, under the qualification of "natural" or "universal," has had various provinces assigned to it. Adam Smith (*Moral Sentiments*, vol. ii.), speaking of the civil and criminal laws of particular countries, observes, that the principles upon which those rules either are or ought to be founded are the subject of the science of natural jurisprudence. The same functions have been assigned by various writers to universal jurisprudence, which again has been limited by others to the investigation of the principles common to the laws of all countries. Sir James Mackintosh uses jurisprudence by itself in the sense assigned above to universal jurisprudence, and again in a sense in which it is difficult to say whether he does not mean it to stand for the whole body of municipal law (Sir James Mackintosh, *Study of the Law of Nature and Nations*, Works, vol. i., p. 381). Carmignani, again, uses the word legislation to signify "the science of establishing law," and thus distinguishes it from jurisprudence, or "the science of the application of law;" and this is the sense in which Mr James Mill uses the word jurisprudence when he says that it has nothing to do with the constitution of rights, or the adapting them to the requirement of universal benevolence, but that its object is to show the best means of protecting rights that exist, whatever they are.

Not to dwell on the misuse of the word "science" in most of the above cited applications of these terms, it has been shown that, strictly, there can be no science of law separate from the general science of sociology. Political ethology converts the theorems of social science into rules of policy, and legislation is the art of applying these rules to particular cases; and the general rules and maxims of policy derived from the science, together with its peculiar art principles, make up the whole theory of legislation. The part of this theory derived from the science must differ for different societies as their states differ; but the principles of law-making—the art rules of legislation—rest on the general laws of human nature, and are everywhere the same. The rules of jurisprudence have the same generality, its principles being maxims of reason based on experience of what is essential to the protection of rights, whatever they are. Parting here, then, with the theory of law as connected with social science, and assuming the rights which ought to be established to be ascertained, two topics remain for consideration; the mode of establishing rights, to be considered under the head "Law-making;" and the mode of protecting rights, to be considered under the head "Jurisprudence."

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PART III.—LAW-MAKING.

Under this head is to be considered how the constitution of the legislature affects its operations, and how laws may best be authenticated, promulgated, and preserved.

I. From the fact that practical and speculative talents are rarely combined in the same men in the highest degree, the practice of legislation ought to be separated from its theory, the practical function falling to the man of affairs, the consultative to the man of science. Between these, however, there should be perfect sympathy and mutual reliance, to secure what Mr Macaulay calls "the just temper of practical and speculative" which should characterize the perfect legislature. If the scientific authority necessary to secure this sympathy existed, the legislature would naturally divide

itself into the following departments:—1, Statistical, taking cognizance of the state of society; 2, Propositional, suggesting ends as desirable under the circumstances of society; 3, Solutional, applying the principles of science to determine how these ends may best be secured; 4, Practical, employing the art-rules of legislation in embodying in laws, and giving effect to, the recommendations of the solutional department. Of these departments, the first and third would fall to be presided over by men of science; and the second and fourth, by men of affairs. It is needless carrying this conception of a legislature farther, as there nowhere exists a sufficient weight of settled belief on social subjects to make its realization possible. Pending the creation of a scientific

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authority on these subjects to repress the tendencies of despotism on the one hand, and popular passions on the other, there is little chance of legislative action being anywhere very wisely or consistently prosecuted. Should such an authority ever arise, it will, in effect, destroy the distinctions of governments. Notwithstanding the opinion of Hobbes, that men would deny the propositions of geometry, if they anywise affected their interest, it is the fact that conclusions from these propositions are never questioned, though daily applied to human affairs. It cannot escape observation either, that in our own legislature contests no longer occur on questions on which even the imperfect science of political economy has unequivocally pronounced. As social questions are rescued from conjecture and empiricism, the area of political agreement widens. Co-operation is facilitated by the clearness of common interests, and the manifest convergence in the distance of opposite immediate interests.

Opposition of the conditions of civil and political liberty.

At present, it is only under a despotism that a principled course of legislation can be pursued; that is, *primâ facie*, the circumstances under which civil liberty could be made most nearly perfect, leave no security for its preservation. The conditions of civil and political liberty are, from the nature of things, in a large measure, opposed to one another. The one is identified with good laws, in security for which the other consists; and almost every condition of beneficial legislation is a relaxation of this security. This security must consist in such a distribution of political authority as that it shall preponderate in no person or class, so as to be exercisable to the prejudice of other persons and classes. Suppose political authority to be equally distributed, the people must, in order to having a legislature, delegate their authority to a few of their number. On this the security, looking away from the influence of public opinion, is measured by their power of making their representatives attend to their wishes; and this practically by the frequency of elections. But the more frequent these are, the more difficult it is to secure qualified legislators, and continuity in legislative operations. The security, again, is greater the less the separate constituencies are. But the less these are, the greater will the legislative assembly be, and the less its capacity for concert and deliberation. The choice, then, is between a small legislature and security, and a large legislature, forced by its unwieldiness to repeat the process of representation, and entrust affairs to a ministry capable of being influenced only at second-hand by the people; in which case, likewise, the security is diminished. In the second case, the conditions of good government are repeated: the assembly must relax its control over ministers. Ministers, again, for the right conduct of affairs, must divide the departments of the administration between them, and be each left free, to a considerable extent, in the conduct of his department. So far the conditions of obtaining good laws and government are relaxations of the security for them, and make it almost imaginary. But, even when it is thus relaxed, the form in which it is taken is unfavourable. Majorities only being represented, the legislature is only partially representative of the people; and, again, majorities of the representatives determine the course of legislation. So that social evils pressing on the minority, or even on the whole community, may long go unredressed, if, in the one case, a majority of the people, in the other of the representatives, would be inconvenienced by redressing them. The action of constituencies on representatives, again, tends to convert what should be the deliberative assembly into the scene of conflicts of immediate interests rather than reasons; and in harmony with the character of the legislative assembly are the means resorted to of influencing its proceedings,—political agitations without it, and party combinations within it. In the absence of a sufficient authority on public questions, principles are loosely held, and readily yielded to the necessity of com-

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bining to carry particular measures. In the balance of the conservative and movement parties, small knots of men obtain an influence on legislation wholly disproportioned to their numbers and the interests they represent, and this opens the way to political immorality. Ministers, overtaken with the duties of their departments, and having, in the fever of party struggles, to initiate legal and social reforms, approach divisions on grave questions only after exhausting ingenuity in delays, among the means of obtaining which is excessive petty legislation; and in the struggles of parties, interests on which the people cannot easily be excited—those related to the administration of justice, for instance—are neglected. Great measures are passed only in an excited and unwholesome state of the body politic; and the alternative is between state inaction and state activity when all the circumstances are unfavourable to reasonable legislation. While deplorable defects in legislation are thus traceable to constitutional securities for good laws and government, what is, after all, the chief security for the latter—the facilities for promptly bringing public opinion to bear on public men, and the sensitiveness to that opinion which, in the history of a free country, has been developed in them, is not a whit more favourable to good legislation; public opinion being itself generally as divided as opinion within the legislature. But if political liberty be thus unfavourable to civil liberty, it keeps alive the spirit of independence and the energies of the people, and makes them prosperous in defiance of bad laws. It has been truly observed, that the sense of security and independence is as essential to the advancement of society as to the comfort of individuals; and, without seeking unduly to disparage the laws of England, she may be instanced as an example of a nation maintained in her rank by the feeling of freedom, in spite of grievous defects in her institutions and laws, incidental to the modes in which her people have had, historically, to struggle for, and maintain their liberties. And, in fact, it is a question, for the satisfactory settlement of which there are no sufficient data, whether, in the present state of our knowledge, the whole phenomena of a nation could be more beneficially determined under the wisest and most benevolent despotism than amid the struggles of opposite interests under a popular government.

It would be out of place here to do more than glance at the subject of government, with which the inquiry into the constitution of the legislature is allied. The reader must refer to the article on that subject. But, in conclusion, of the brief, and necessarily unsatisfactory remarks here presented, it is necessary to repeat, that the main distinctions of governments will disappear should science ever rescue social questions from the waste of opinion. Such a government as our own will then show to the greatest advantage. The importance of the separation of legislative, judicial, and executive functions, characteristic of a balanced government, will then most clearly appear; the inclination to despotism as favourable to good legislation will be removed in the presence of a scientific authority; and with the means of obtaining good laws, we shall have ready provided the best means of administering them. In the transition state, a balanced government, as compared with a despotism, is what a raft is to a ship. The one, trim and rapid in its movements, sails up to the sunken rock on which it strikes; while the other, unsteady and oscillating in all its parts, but safe in the inherent coherency and buoyancy of its materials, passes on always with perfect security, though in constant and immediate contact with the source of danger.

II. The evils arising from judge-legislation have been Judge-frequently, ably, and eloquently exhibited during the last half century; but it is fitting that the question respecting legislation. it should be here discussed, because it bids fair to continue for some time to be one of public interest. For the same

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reason it is here considered in its relation to the state of the law in our own country.

The common or unwritten law.

The common law is embodied in a great number of written and printed records—the reports of decisions of courts of justice pronounced from time to time over centuries. But though its rules are enacted for cases as they occur, the fiction is that they have existed from of old, and are not enacted but declared. According to this fiction, common law consists of a published and unpublished part—the latter latent and unknown till declared; while the former, though declared, can scarcely be said to be known, for it is liable to be made to give place to newly-discovered portions of the old law. The judges who declare its rules do not know them relative to new cases till they have decided them. When such cases occur they have to make inquiry what the law is. In this inquiry they are guided by the analogies of the new cases to old ones. The pleadings before them are, as Paley observes, “a competition of opposite analogies,” the best of which are entitled to prevail. When the analogies are few and faint, they decide the case according to their notions of the requirements of “reason and justice” respecting it; and having once pronounced a decision, they are bound to adhere to it, unless it be “flatly absurd and unjust” (Blackstone’s *Commentary*, vol. i., p. 70), of which themselves are the sole judges. So that at any time they may make new rules, and unmake old ones, provided they can bring themselves to consider them absurd and unjust.

Objections to judge-legislation.

The objections to this species of legislation have been brought by Sir Samuel Romilly under six heads. 1. Judge-made law is necessarily an *ex post facto* rule. “It governs all past as well as all future transactions. Property, which has been purchased or transmitted by descent to the present possessor of it, is discovered by the newly declared law to belong to others; actions which were thought to be innocent turn out to be criminal, and there is no security for men’s possessions, their persons, or their liberties” (*Edinburgh Review*, xxix. 228). 2. In making laws the judges are compelled to proceed almost wholly on technical reasons. “They are forbidden to entertain any of the considerations which ought most to influence the judgments of those who are avowedly employed in making laws. What will most tend to promote the general good, or what is best adapted to the present habits and modes of thinking of mankind, the judicial legislator is bound to disregard. He is to consider not what would be the best law on any given subject that could be made; but what law was most likely to have been made upon it at the remote period when the common law is supposed to have had its origin. All his researches tend to discover, not how the evil which has occurred may best be remedied, but in what manner it is probable that, in a very different state of society, the matter would have been ordered.” Hence the anomaly of the two main branches of law growing on opposite principles; the one, by analogies, drawing nourishment from the judicial debris of centuries; the other expanding on the principles of expediency. 3. Judge-made law is an uncertain rule. 4. Judge-made law wants generality of application. The judge-legislator is forbidden to give a comprehensive rule. He must restrict the law to the particular case before him, and take the narrowest view of that case. He thus loses every opportunity that presents itself of giving a rule to include many possible cases as well as that before him; and while terminating a litigation, does little towards defining the law and precluding future contests—as analogous cases will be found to differ in some respects from one another, and from that decided. The opinions which he may offer on such cases in illustrating his decisions are treated by his successors as extra-judicial, and of no authority. 5. Judge-legislators may be, and often are, unqualified to legislate on particular cases, on which, however, it falls to them to legislate. The

branches of legal study are various, and the studies of most lawyers are special. When lawyers mount the bench they are esteemed qualified on all branches of law alike, and to legislate on all subjects whatever which chance may bring before them. 6. Judge-made law is made by men over whom the people have no control. “Our legislators here,” says Sir Samuel Romilly, “have been, not the representatives of our choice, but often the servile instruments of our monarchs.”

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This species of legislation, however, has its advocates—Arguments in favour of judge-made law. especially among the judges. Successive governments have for more than twenty years held it settled that the unwritten criminal law at least should be reduced to statute; but the reform has yet to be accomplished. When the Lord Chancellor Cranworth, in 1853, submitted specimen criminal-law bills digesting the whole law relating to the definition and punishment of offences to the judges for their opinions, they, with one exception (Chief Justice Jervis), deprecated the attempt to reduce the unwritten law to statute.

“The rules of the common law,” said Mr Baron Parke, “are clear and well understood, and they have the incalculable advantage of being capable of application to new combinations of circumstances perpetually occurring, which are decided, when they arise, by inference and analogy to them, and upon the principles on which they rest.” “To reduce the statute law into a narrow compass,” said Mr Justice Talfourd, “is an object entirely free from objection, and which, if accomplished with care, can produce nothing but good; but to reduce unwritten law to statute is to discard one of the greatest blessings we have for ages enjoyed in rules capable of flexible application.” “It seems to me,” said Mr Baron Alderson, “to be a very unwise thing to abolish the common law principles of decision, which can accommodate themselves to the varying circumstances of the time; and thus, as it were, to stereotype them, by act of parliament, in verbal definitions, many of them inaccurate.” Lord Mansfield is reported to have entertained a similar opinion of its merits; holding that “the common law, which works itself pure by rules drawn from the fountains of justice,” is superior to an act of parliament (*Athyn’s Reports*, vol. i., 32, 33).

From their statements on the subject, we gather that the arguments in favour of this species of law are:—1, That it is prepared for all cases; 2 (which is the first argument in a different form), That its rules are capable of flexible application. While the objections to its reduction to statute are, —1, That its principles are so interwoven with the circumstances of cases that they cannot be taken up from their contexts and separately enunciated; 2, That supposing the unwritten law converted into statute, the uncertainties of the interpretation, to say nothing of the errors of its definitions, would exceed those of the law as it stands; and, 3, It is maintained by some, that the same degree of logical coherence as the common law possesses cannot be given to written law. The value of the arguments in favour of unwritten law will best appear in an examination of the objections to reducing it to statute, to which we pass on with the remark that at the worst, supposing written law cannot be made to meet all cases, the discretion which the judges now have would have to be left with them so far as concerns distinctly new cases.

The first objection is inconsistent with the assertion of the judges, that they find the common law rules clear, and easily applicable to all sorts of cases. It cannot be clear what the rules are, and yet be impossible to say what they are. In applying them the judge necessarily lifts their principles out of their old connection, and plants them in new circumstances; and, in explaining them, in applying them, he can neither come nearer to them, nor apply them more correctly than he has language in which accurately to express them. In other words, the errors in the judges’ application of the principles have for their measure, so far,

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the errors in their definitions of the principles. The question, then, is not whether the rules and principles can be defined with perfect accuracy, so as to be transferred in their integrity into statute; but is between the errors of the definitions in a written law,—the definitions being made by the men best qualified for the work, the body of judges themselves, for instance,—and the errors of the definitions of the same rules committed by the same men, individually, in applying them. There can be but one answer to this question; that definitions made, we may say, on the moment, are likely to be more erroneous than those made on consultation and deliberation; and that the errors commisable by judges, in applying common law rules, are, so far, likely to be greater than they might be if the rules were deliberately defined in statute. The alleged facility of judgment is incompatible with the impossibility of defining the law, unless, by the flexibility of its rules, it be understood that they readily take whatever shape the judges choose to give them. And, in fact, we are forced to understand it in this sense. It is not that the judges easily apply the rules of law,—that, according to themselves, cannot be done,—but *rules*, it may be, wrong in principle, but having the “incalculable advantage” of being easily applied. Their position is, that they do not administer law at all, but a species of equity.

The flexibility of the common law rules is one of the principal objections to them; so long as it exists, decisions must be capricious, and the law uncertain. Whoever has often heard the common law declared must be aware of the unsatisfactoriness of the reasons occasionally assigned for it; the words “reason and justice” filling up arguments based on shadowy distinctions, and on a few, selected from many, of the analogies presented by cases, on no principle, or one vaguely expressed. What Beccaria has said of the discretion of judges to decide according to “the spirit of the law,” applies to their making the law itself. “The spirit of the law,” he says (*Essay on Crimes and Punishments*, p. 22), “will be the result of the good or bad logic of the judge; and this will depend on his good or bad digestion, on the violence of his passions, . . . and on all those little circumstances which change the appearance of things in the fluctuating mind of man.” Selden’s condemnation of equity is also directly applicable. “For law,” he says, “we have a measure, and we know what we trust to. Equity is according to the conscience of him who is chancellor; and as that is larger or narrower so is equity. ’Tis all one as if they should make the standard of measure of the chancellor’s foot” (*Table Talk*). “Certainty,” says Lord Bacon, “is so essential to law, that a law without it cannot be just; . . . and it is a true maxim, that the best law leaves least to the breast of the judge.”

If, then, the definitions of written law may be made more closely to approximate to the full and accurate expression of common law rules and principles than the definition of the same rules and principles made by the judges in applying them from case to case; and if, by defining them, we in a degree destroy their present uncertainty, there can be no doubt so far as to the desirableness of transmuting the common into written law. Even were it not clear that the definitions may be improved, the certainty gained by fixing them would almost of itself atone for their imperfections, especially as these must soon appear and be amended.

Second objection.

As to the second objection, it is incredible that the analogies of cases do not offer wider scope for misjudgment and uncertainty than the meanings of statutory words. It is argued, indeed, as if the liability to error from the ambiguities of language lay wholly with judgments proceeding on statute. But the probable errors are less in interpreting statute law than common, because the ambiguities multiply with the words to be interpreted, and because the definitions of statute law are short compared with the ac-

counts of circumstances, and the comments of legists and judges, through which alone the common law rules can be known. No doubt, in reducing the law to writing, a discretion of interpretation must be given to the judge instead of that taken from him; but then its exercise will at once consume it, so that the new discretion will both be less dangerous and shorter lived than the old. And this is all that it concerns us to know. That the definitions of the written law can never be made perfect, or the discretion of the judge be wholly removed, is nothing to the purpose; it is sufficient that its imperfections, and the errors commisable in its application, may be made less than those of the common law as now administered. Those who glory in the capacity of the common law of “working itself pure” should not grudge to endow written law with a degree of the same capacity.

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The coherency which can be given to written law, it is Third objected, is less than the unwritten law possesses. The question is, whether it is likely that a system branching from well-defined general principles into particular applications of them can be made to observe a greater logical coherence than is presented by a system that, beginning in rude and indefinite principles, has spread by the aid of analogies and technical reasons, under the superintendence of a great many minds of every shade of intellectual capacity and conscientiousness. The question contains its own answer. It has been well put by Mr Empson (art. *LEGISLATION*, 7th edit. *Encyclopædia Britannica*), who makes, for the sake of argument, a concession to the common law not due to it—that its original principles were general and sound. “Of the two presumptions,” he asks, “which is more probable,—that the qualities of systematic coherence and dialectic deducibleness will be the natural accompaniments of a system which branches from sound general principles into particular didactic regulations; or that they will be the artificial consequences of a fictitious system built on an interminable series of specialties called precedents, especially when it is considered that the very element of case law involves so many points of variation that, on any occasion, nobody can be sure that he is not exercising his logic upon a different set of precedents, or upon those specialties in the self same precedent which, after all, the judge may consider as not properly applicable to the case? There are embodied, in almost every precedent, opposite analogies, with sundry hanging threads attached to them, any one of which a judge, who is a little capricious, may lay hold of at his pleasure.”

III. The discretion left to the judges is only one source Unmanage- of the uncertainty of the common law; if they were per- able mass mitted to give comprehensive rules for general cases, its un- of the law. certainty would probably be less than it is. The rapidity with which case law accumulates may be judged from an inspection of the annual volumes of reported decisions. According to Blackstone, the common law was long ago so great that it could only be perfectly known by a twenty years’ study. No sensible man, even in the legal profession, now attempts to acquire a perfect knowledge of it; judges themselves are contented to know it at second-hand from unauthorized comments on conflicting decisions; and even the commentators occasionally disagree as to its rules. Nor is the mass of the statute law less. Every session of parliament adds to it often as many as a hundred statutes; which rarely cancel statutes previously in force on the same subjects, so as to be amended and uniform substitutes for them; but are commonly designed to amend acts that previously amended others; or to confirm and strengthen former statutes in like cases while adding or altering some particulars as to their operation. New statute rules thus rarely stand clear and intelligible apart from the mass of the law, but are welded into and lost in it; “whence sometimes follows that torture of Menutius

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whereby the living laws are killed in the embraces of the dead ones." Even the projectors of the Criminal Law Bills, already referred to as designed to consolidate and digest the whole law relating to the definition and punishment of offences, thought fit to propose only partially to repeal thirty-one acts relating to offences of the thirty-three set forth in the schedules to the bills; and of those which they proposed partially to repeal, many they designed to repeal only in parts of sections. Of the 7th and 8th George IV. chap. 29, for instance, they would repeal only certain sections, and of these eighteen only partially. On this system of law-making, the more active our legislators are, the more confused the law becomes. "There are at this moment" (1842), says Mr Burton, "upwards of 130 statutes, more or less in force, in regard to the stamp laws;" and since he wrote legislation on stamps has been active. It is thus that the statute law is brought into as great uncertainty as the common law. The number of statutes is now ten times greater than when Bacon complained, "So great is the accumulation of the statutes, so often do they cross each other, and so intricate are they, that the certainty of the law is lost in the heap." When we look at the accumulation since his day, the story will be credited of a four days' debate by learned advocates before a Master of the Rolls (Sir William Grant) on the interpretation of a statute, which was afterwards discovered to have been repealed! As will (in view of the uncertainty of the common law) the truth of the report of a saying of Lord Eldon (Earl of Radnor *v.* Shaftes, 11 *Vesey*, p. 453), "Having had doubts upon this will for twenty years, there can be no use in taking more time to consider it!" Of a piece with which is the exhibition of the ignorance of the law recently made by the legislature itself. Long debates took place in the sessions of 1854-55 and 1855-56, on a bill to amend the existing law (Mr Lowe's Partnership Amendment Bill) before certain persons of high "legal authority," after "much consideration," concluded that, "by the analogy of cases, the rule to be introduced by the bill was already in the law!"

The Specialty Character of the Law is at the root of this confusion. We have too many laws for particular cases, to amend clauses of special laws, and to amend laws that amended others. This is partly owing to the specialty character of our institutions, the laziness or want of system of legislators, and the peculiar constitution of the legislature; but principally to empiricism. The tit-bit procedure necessitated by empiricism, by augmenting the labour of legislation, prevents the law attaining the perfection which, even on empirical principles, it might have. Empiricism encourages attempts to cope with casual circumstances by small measures to meet evils incidental to others, and which, if left alone, would cure themselves, or which can be cured only by striking at the greater evils. The special, again, work up against the general laws, are soon found not to work well, and are tinkered to shape them to the latest views. The state of the law is, in short, the natural consequence of the system of rules which Mr Macaulay represents the legislature to have followed from the age of John to Victoria. "To think nothing of symmetry and much of convenience; never to remove an anomaly because it is an anomaly; never to innovate except where some grievance is felt; never to innovate except so far as to get rid of the grievance; never to lay down any proposition of wider extent than the particular case for which it is necessary to provide." It is satisfactory to be able to record that, of late years, the disposition to depart from these rules has been acquiring strength, under the pressure of the accumulation of small inconveniences occasioned by so long following them.

Law-drafting.—The bulk of the law is farther increased by the redundancy of its language. The evils of bad law-drafting have been ably exhibited by Mr Symonds, in his

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Mechanics of Law-making, where he shows that the mass of the law is greatly owing to—1, The precise over-specification of non-essentials in acts of parliament; 2, The constant repetition of the same words, their doubles and equivocations; 3, The constant reiteration of all the qualities, incidents, and relations of a thing, as often as its name is repeated; 4, The confused structure of clauses; 5, The unscientific method of drawing acts. We must add, that the bulk of the statutes is farther swollen by redundancies of substance. Provisions for carrying laws into operation, for instance, instead of forming a separate law of procedure applicable to whole classes of statutes, are frequently brought into the statutes individually. No idea can be formed of the extent to which our 18,000 statutes might be reduced by the simple operation of stripping them of these redundancies. As it is, the absence of facilities of reference to the statutes—the last defect of law-drafting to be noticed—aggravates the evils due to their number and bulk.

Law-literature—Justice could scarcely be administered in the existing state of the law, if the accounts of it by unauthorized commentators were not allowed weight in courts of justice. But, on the natural law of supply and demand, private enterprise has partially made up for state inefficiency. Any work reducing the law on a class of subjects to a reasonable compass is readily grasped at. The commentators, referred to at first from convenience, come at last to be authorities in courts of law; and institutional or law-literature seriously undermines the authority both of the legislature and judge-legislators. Nor is an extensive acquaintance with the commentators necessary to assure one that the uncertainties of the law are fully reflected in their works; often they merely conjecture what the law is—balancing the authorities of names, and adjusting conflicting analogies. The uncertainties, indeed, are often slight, but sometimes they are absolute; and even slight uncertainties are fruitful sources of litigation. And then the superfluity of law-literature threatens to induce a similar state of matters to that in which its own authority originated. The books multiply so fast on the various branches of the law, that they will soon be as unmanageable as the law itself.

Civil Equity is in the case of the common law; and the efforts to procure its reduction to written law have been met by the same objections. In England it has long lost its original arbitrariness; that element dropping out with every exercise of judicial discretion. The arbitrariness left is a discretion in distinctly new cases; for the rest, the application of the principles of old decisions to analogous cases. In connection with civil equity must be noticed the jumble of jurisdictions as an additional source of uncertainty. To take a case lately before the public, three courts, proceeding on different principles, have jurisdiction in cases of intestate succession, and have no common court of appeal. To the uncertainties in the same court are hereby added those due to the concurrent jurisdictions of judges administering different principles. It is not, then, to be wondered at, looking to the state of the law, and to our system of judicial procedure—"a technical system invented for the creation of costs"—if we frequently submit to injustice from one another rather than risk the greater evil which it is in the power of the law to inflict on us if we set it in motion to do us justice.

IV. By codification is understood an authoritative consolidation of the whole law, in its leading divisions, giving it coherency and unity of principle, and making it the clear expression of comprehensive and consistent rules. That this reform is necessary, has been maintained by many of the best writers on the laws of England, by none more ably than by Bentham. The question of a code is one of fact, to be discussed in the view of the state of the law and the practicability of the reform. A barbarous age presents neither the materials for a code, nor the

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generalizing spirit necessary for its construction; nor, such is the harmony of things, the necessity for its being constructed. But when the laws of a country present such rich materials as ours do, and in such confusion, nothing short of the radical reform implied in codification will suffice for them. We have passed the point attained in every country that advances far in civilization, when, in the growth of law, its exuberance impedes its natural functions, and it becomes imperatively necessary to prune it in all directions.

The principal objections to codification have been considered and rebutted by anticipation in the discussion regarding the desirableness and practicability of transmuting unwritten law into statute. If the law can be, and ought to be written, no one will assert that it ought to be written after the manner of our statute law, or deny that our statute law stands in need of systematization and consolidation. In fact, no one admitting the positions which we conceive ourselves to have established under the head "Judge-made law" can question the desirableness of a code, however he may doubt its practicability.

Its practicability.

The practicability of codifying the law might be proved by a direct argument on its conditions, to the effect, that no insuperable, or even very great difficulty, lies in the way of its being done; and the argument might be confined to the civil and penal codes with which the principal difficulties, such as they are, are confessedly connected. The difficulty of the civil code is that of defining and classifying rights; and of defining the facts which give them commencement, and put an end to them. Now rights, and the facts which begin and end them, are already in a way defined by the law. To the extent that this is well done, therefore, the difficulty is commensurate with that of knowing the existing law, and it is not for the opponents of codification to maintain that this is insuperable. The first operation in the process of codification is to bring the definitions of rights together in lists, according to the nature of the subjects to which they relate; the next is to arrange those of the same kind according to duration and extent. The difficulty of the former operation is diminished by the fact, that on the lists being partially formed, the rights set down suggest those to be added; and the difficulty of classification is diminished by the principles of law coming out, in the process, with great clearness, and throwing light on the arrangement to be adopted. When the lists are obtained, and their arrangement effected, what remains is to specify the facts that shall give rise to rights and end them. This has also been done by the law from case to case, so that the difficulty of it is commensurate with that of knowing the law; and when these facts are defined the code is complete. In none of these operations does there appear to be anything insuperable, or even very difficult to be done, although, no doubt, considerable perspicuity and logic would be necessary for the proper classification of rights. The penal code presents still fewer difficulties, being less extensive than the civil. What must be done is to define and classify crimes, to fix the penalties to be incurred by committing them, and to set forth the rules of law as to the incapacity to commit offences, &c. Crimes and their penalties, &c., being already defined by the law, the difficulty is again the same as that of knowing the law.

But the practicability of codification is above depending on an abstract argument on its conditions. Whatever the difficulties of it may be, they have been triumphantly surmounted, as in the Code and Pandects of Justinian, the Code Napoléon, and the Code of Louisiana, which were successfully made to embrace the leading rules and principles of the systems of laws which they were respectively framed to supplant. And while the Code of Louisiana, which has been in operation for nearly half a century, may be directly appealed to in proof of the practicability of codifying the common law, the Code Napoléon was far more

difficult of construction than an English code would be, because of the greater heterogeneity of the provincial usages which it had to reduce to system. If farther proof be wanted, we appeal to the commentaries from which our lawyers and judges know the law. What, in fact, are the commentaries, but successful partial attempts at codification? And will it be maintained that what private individuals do so well cannot be done more efficiently by the state? That codification is difficult, and cannot be perfectly executed, is nothing to the purpose. It is enough if it be possible to frame a code more perfect than any of the commentaries, and having authority. The Criminal Law Bills of 1853 may be instanced as proving the practicability of this, as they go far towards being a complete penal code, and are, in point of style and order, almost all that can be desired. The practicability of framing a penal code has, indeed, been conceded by many who hold the negative on the general question, but with what show of reason will appear from considering that the penal code, though not conterminous with the civil, presupposes the definitions of the major part of it, and of many of the rules of constitutional and official law as well.

The degree of perfection which may be given to the code will, of course, depend principally on the care, fidelity, and capacity, of the men selected to frame it. The steps in the operation of forming it would appear to be,—1, The classification of the statutes and of the unenacted law; 2, The consolidation of the statutes and digestion of the unenacted law; 3, The digestion and assimilation into one body of the consolidated statutes and digested common law. The principle of classification being previously adopted, the workers on the statutes and on the unwritten law might continue their labours separately over the first and second steps; in the second also, the labour might be lightened by division, the consolidation of each class of statute and common law rules being entrusted to single persons; the workers coming together again in the third stage of the process. In the last state of reduction, the best way would appear to be, clearly and briefly to set forth the general rules of law, and to follow them by specifications of the particular cases to which they apply. Great care would be required in all the stages not to allow any rule of law or principle of a decision to drop out; and then to have all disputed or doubtful points cleared up by enactment, and to have, by the same means, the contradictions and inconsistencies of the law rooted out. When the scaffolding by which the law has been erected has been cleared off and buried out of sight, and when it has been stripped of its redundancies of language and substance by the first and second operations; the third will be found to be far simpler than can now be conceived. It is not to be concealed, in view of the degree of organic unity which codification aims at giving the law, that the proposal to codify it is not a proposal to consolidate it merely, but to reform it as well. Whatever machinery were employed to consolidate it, would find no small part of the difficulty of its task to arise from its being restrained from reforming it; and in any attempt to classify the laws, their inconsistencies could not fail to appear. It is comparatively easy to obtain structural unity in the composition of harmonious materials, but it is impossible to obtain it in the composition of materials irreconcilable and discordant.

We cannot enter farther into the consideration of the machinery best adapted for codifying the law, than to remark, following high authority, that the separate divisions of the code could more readily and successfully be reduced to unity and order by single minds, than by several working together. Supposing men of the requisite capacity to be obtainable, they should be entrusted each with the department of the law of which he has most knowledge; one or more to follow in their tracks, rectify their mistakes, and fulfil their designs. Those engaged in the business would

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Agency for forming the code; difficulties of getting the code made and enacted.

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find again, that the tracks of the commentators who preceded them required only to be straightened here and levelled there to be perfect avenues to the law; so that the pains taken by private persons, in past times, to reduce it, might all be made tell towards its final reduction into the code.

Commissioners for the consolidation of the English law have now been at work for over twenty years, and the Criminal Law Bills of 1853 are, so far as we are aware, the only published practical results of their labours. We understand, however, that they have consolidated all the statutes relating to indictable offences,—with the exception of those connected with laws relating to bankruptcy, customs, and religion,—into six bills; and included in two (having finally abandoned the bills of 1853) the law relating to principal and accessory, and criminal procedure. For the rest they *expect* to be able to reduce our thousands of statutes into three hundred acts or thereabout, by rejecting from the statutes obsolete acts and acts of a special nature, and consolidating the rest. If they do even this, they will confer on the nation an inestimable blessing. But it must be admitted, that if the practicability of the code were to be measured by the smallness of the pretensions of the commissioners, after so many years' consideration of the work entrusted to them, and by the fruits of their labours over so long a time, the case would indeed be desperate. But whatever may be the qualifications of those employed on the commissions, it cannot be said that they have received much encouragement. The public scarcely believes in the sincerity of their undertaking; which is itself too narrow to meet with the full approbation of zealous legal reformers. The position is one of great difficulty; but it is clear that the difficulty is increased by the disposition of successive ministers to compromise the question of a code for a partial reform, and to postpone the realization even of that. Either our ministers want the largeness of view and the decision of the masters of men who have given codes to the world, or their tenure of office is too uncertain to permit of their energetically acting out their views, and they are naturally lukewarm in the prosecution of tasks the merit of completing which may accrue to others. Whatever be the explanation to be given of the fact, the instance can scarcely be said to have yet occurred of a popular government conferring the blessing of a code on its subjects. Supposing the task finished, the legislature is wholly unfit to judge of its merits, and must accept or reject it on the authority of individuals. In England, high authority on legal subjects is scarcely to be found in men not enjoying political importance; and the political lawyers are called on too laboriously to attend to their own and party interests to exhibit those qualities of head and heart which would dispose the legislature and the people to trust them, even if they could be induced to undertake so great a labour as would be necessary for successful codification. The only hope of the successful accomplishment of the reform lies in the creation of a strong public feeling in its favour by the repeated exhibition of the evils of the law.¹

The sub-
codes.

The code must consist of five sub-codes,—1, The constitutional code; 2, The official code; 3, The civil code; 4, The penal code; 5, The code of procedure. The subjects of the civil and penal codes, and the difficulty of constructing them, have received special consideration.

The advantages of forming the laws of procedure into a

separate code are apparent. For the rest, municipal or local police laws depend on the powers of magistrates of burghs defined in the constitutional code; while general police acts are a standing portion of the official code. The proposition to codify the official laws is not made without hesitation; but it is here the law is most special, cumbrous, and deficient in system, and that legislation is most laborious. The extent to which system and generality might be given to these laws has been pointed out by Mr Symonds, to whose work on the *Mechanics of Law-Making* the reader should refer on this subject. The laws relating to the revenue, which should in strictness form part of this code, produce social changes so suddenly, through the constant endeavour of the public to relieve itself of its burdens, and must therefore be changed so frequently, that it would be useless to attempt codifying them. The modes of raising the taxes also change with the taxes, so that neither the laws which determine the taxes, nor those which regulate the revenue machinery, can be other than ephemeral. There appears to be no reason, however, why the other laws of the public service should not be made general, permanent, and public. It would be in favour of administrative reform if they were. They are at present utterly incognoscible—the powers and responsibilities of departments and commissions lying concealed under their entire history. The necessity of codifying the constitutional laws need not be insisted on. Only one in a thousand has, at present, more than a faint general idea of the system of government under which he lives. If the improvement of that system is desirable in any respect, it would follow on its real character being known.

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making.

That the code may be made perfect in its principles and appliances once and for ever is an idle fancy; the law can never remain in the rear of the civilization which it guards. Grown up with and out of experience, it must constantly change with it. All that can be aimed at is to round and compress the law relative to the experience of the past, and to start it afresh with provisions for its accommodating itself to the requirements of new times, without losing its accessibility and certainty. The question is with what provisions to equip it. Two sets of ends must be provided for; the first, for accomplishment at short intervals, are three in number: 1, The collection of materials for the growth of the code; 2, Their preparation for being incorporated in it; and, 3, Their incorporation into it; the second, for accomplishment at longer intervals, are two in number: 1, The revision of the code, and rectification of defects discovered in its principles; 2, The excision from it of rules found to be unnecessary or pernicious owing to social changes. Courts of justice must continue to be the principal garnerers of materials for the growth of the civil and penal codes. The imperfections of legal principles and definitions are most likely to be discovered in these courts, in which also cases not provided for arise for decision. It has been suggested that the judges should be bound to report on cases of hardship to which, through over-generality or particularity, the law appears inapplicable, their reports to be laid, at short intervals, before the legislature as materials for law reform; and that they should decide distinctly new cases as they best can, their decisions of them to be final, and their reports on them to be materials for general laws to include them. By these means the materials for the growth and reform of the law, so far as suppliable by

¹ The government is now said to be at last earnestly bent on the reduction of the whole *statute* public law of England to the consistency and dimensions of a practical code. The chief commissioner thus describes the procedure which he means to adopt:—"To take the statutes at large from Magna Charta to the last act of Victoria; to expunge and reject from the statute-book every act and every enactment which is either repealed, expired, or obsolete, and then to take what remains (which will consist of all that is law in force, and to continue in force), to digest and to arrange this body of law, by dividing it into classes, and sub-dividing each class into single subjects; and then to reduce the whole into single bills, each bill being on a single subject, but comprising the whole of that subject"—(Letter of Sir Fitzroy Kelly to Lord Brougham). The result of consolidation will be, that 40 vols. of statutes will be reduced to 4, which will constitute the statutes at large, and contain the whole of the acts in actual force, arranged and digested, so that an inquirer may find at once all the statute-law upon any particular subject.

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courts of justice, would be regularly obtained by the legislature. It has also been suggested that there should be a commission for receiving complaints against the law. Cases of hardship constantly occur that never enter courts of justice; and defects in the law are daily suggested to advocates in private practice, by cases neither in court nor in hand, which they forget in the hurry of business, but which might be made available for law reform if there was a commission to which they might be notified. The preparation of the materials thus collected for the code should be the work of sub-departments of the legislature, which, over and above its other duties, should be able to keep the laws parallel with judicial legislation. As to the third requisite, it has been suggested that there should be a standing commission to publish the acts of the legislature, and classify and adapt them for introduction into the divisions of the code, which it should be their duty also to re-edit at certain intervals, probably of from three to five years, according to the scheme of Lord Bacon. The code would thus never be long in the rear of the current legislation; and the law, logically arranged and authenticated by the state, would be always accessible and certain. It is unnecessary to do more than

mention here the necessity of accommodating the language of the code to that of the people. It is important that it should be plainly written in the tone of the time. But as the growth of language is slow, the necessity of altering the code on this account would be felt only at long intervals.

When the code is equipped with the provisions above suggested, judicial decisions will be of value, as containing its interpretation and the history of its application, and exemplifications of its failure and success. They will, in consequence, continue to be studied by lawyers, and become of importance to legislators. The reform which we have been contemplating, when effected, will no doubt be accompanied with provisions for authenticating reports of decisions, and keeping under their number, by restricting them to crucial and leading cases, and throwing overboard the reports of repetitions of decisions which now swell the records. The mass of the decisions thereby becoming manageable, they would reward careful study. The auxiliary law-literature founded on their analysis would thenceforth be rather critical than expository,—aiming at the improvement, instead of the illustration of law; undermining its authority no longer, save by examining and testing its principles.

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PART IV.—JURISPRUDENCE.

Jurisprudence, or the doctrine of the application of law, accepts law as it is, and considers how its operation may be made most effectual. While this is its peculiar province, it is strictly not a separate doctrine, but falls under the general theory of legislation. Rules of law, and the manner of prescribing and enforcing them, cannot well be altogether separately considered, and are here separately treated of chiefly for the convenient discussion of the various questions concerning law.

To protect rights is the same thing as to apply law. Law commands certain actions to be done, and permits or forbids others. All its rules and institutions, whether relating to persons or things, are, directly or indirectly, limitations or definitions of powers of action, assigned by it, and vested in, particular persons, over the persons of others or things. And since these powers of action are rights, it follows that to protect rights is to apply law.

As every power given to one over others or over things limits the powers of others over themselves or over things, law, in conferring rights which, as enjoyments, are objects of desire, necessarily creates obligations proportionally burdensome, and therefore objects of aversion. Rights, therefore, are exposed to be contested and violated, and need to be protected, both to secure their possession to those to whom the law has assigned them, or in whom it has vested them, and to prevent their violation. The object of inquiry is the best means of affording them this double protection.

The definition of rights as a means of protecting them.

In the first place, rights must be clearly defined. Their definitions, by setting forth the extent of the powers which they imply, and the facts which vest them in particular persons and terminate their possession of them, will prevent disputes as to their ownership, while warning men off from interfering with their exercise. It is only when it is certain what rights are, and who owns them, that public opinion and the other sanctions of law can operate steadily in their defence. For similar reasons, offences, or violations of rights, must also be clearly defined. Their definitions will at once warn men off from committing them, and steadily direct the unfavourable sentiments of men against those who commit them.

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It is farther necessary, for the protection of rights, to provide (1), for the settlement of disputes, as to their extent and possession, and (2), for guarding them from violation, and for the prosecution and punishment of those who violate them. It is designed to take up, under the title "Judicial

Procedure," the consideration of the provisions to be made for the settlement of such disputes and the prosecution of offenders; and under the title "The Doctrine of Punishments," that of the leading questions connected with the prevention of offences and the punishment of offenders.

I. The nature of the judicature, and the procedure before it, must depend on the nature of the cases which give rise to legal contests, and the operations necessary for their settlement. Causes of litigation may be complicated in various ways. Civil causes may involve several questions of right, each of which may require separate settlement, or two or more of which may rest on the same grounds, and may be settled conjointly; and they may include several persons as litigants for their joint or individual interests. But the most complex cause of this sort is resolvable into simple causes, in which single rights and pairs of litigants are concerned. Criminal causes also may be complicated so as to involve several persons as accusers and defenders, and several charges, and are similarly resolvable into simple causes with single charges and pairs of litigants; so that all causes are representable by the two cases of A and B disputing about a right, and of A complaining that B has violated a right. What has to be done in either case, the law being clear and settled, is to solve a question of fact. In the former case, In whose favour, A's or B's, is the fact on which the legal title to the disputed right depends?—in the latter, Did B commit the act charged upon him by A? This question of fact is the issue of the case between A and B, and in a criminal cause, appears at once from the complaint; but in a civil, it is to be derived from the whole circumstances founded on. The first operation to be performed, then, is that necessary for bringing the case to an issue in point of fact. The issue being obtained, the next operation is to lead and weigh evidence to settle the question of fact. The fact being ascertained, it remains to declare its legal consequences. This is the decision of the case to be followed by warrant to the executive to enforce its terms. If the fact favours A, the decision is that the disputed right is his; if B committed the act charged on him, the decision is that he shall suffer the consequences attached to it by law. Here the distinction between the two cases may be dropped, as the latter plainly does not require a different procedure from the former. It is a simple case of the former, in which the operation to get at the issue is unnecessary. We may now consider the case of A and B disputing about a right, assured that all necessary to be done in the most complex cause will

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The three operations to be performed, then, are,—1st. To bring the dispute between A and B to an issue in fact, in which A shall affirm and B deny that something happened or was done in a particular way. 2d. To lead proof as to the fact. 3d. To pronounce judgment and issue warrant for execution. As the conditions of successfully performing the second operation have been discussed elsewhere in this work (see art. EVIDENCE); and as there is nothing to be said about the third, the business in hand is wholly with the procedure for evolving issues, the constitution of the judicature for the several operations, and the provisions to be made for the fidelity and fitness of judges.

Preparation for proof. A and B dispute about a right to which each believes himself entitled because of certain actual or supposed facts which he conceives to have so happened as to have made it his. Now, the facts which invest rights in particular persons, and divest them of them, being defined by law, what in the first place is necessary is, that they come together before a person who knows the law, and can tell them the legal qualities of the facts on which they rely. Suppose the suit to be at the instance of A, he must, to commence, state before this person the fact on which he relies. B may then deny it or its investitive quality, or allege a subsequent fact vesting the right in himself, or an antecedent fact preventing that alleged by A operating to vest it in him. If B admits A's allegation, but denies the investitive quality of the fact, the judge has merely to declare whether it has that quality or not. If he admits its quality, but denies that it happened as alleged, the issue is at once reached whether the fact happened as alleged? If, admitting the fact and its quality, B alleges a subsequent or antecedent fact, vesting the right in himself, or preventing it vesting in A, the same course is open to A with respect to B's allegation, that was open to B in respect of A's first allegation. He may deny it; admit it and deny its quality; or allege an antecedent or subsequent fact, as in the former case. At every stage there thus arises a question of law or fact, or both; and after a few steps at farthest, if the parties are made to face each other, the issue or final question of fact is naturally evolved, and the case prepared for proof.

The allegations of A and B, in turn meeting one another, soon exhaust the whole circumstances founded on. The issue will be the more speedily and correctly evolved, the fewer fictitious circumstances introduced to complicate the case. It is desirable, then, that neither party make any allegation that is not true; and that the facts alleged should have the qualities ascribed to them. To secure the first, litigants should be subjected to certain penalties if convicted of making allegations that they knew to be false; *e.g.*, they should be made to bear the expenses of the suit, so far as due to its being complicated by these allegations, and farther, a pecuniary fine, to be fixed according to the circumstances. It has also been proposed that they should be made to swear that their allegations are true to the best of their belief, and thus to make them under the penalties of witnesses. There appears to be no good reason why this should not be done; and there certainly is good reason why something should be done to obviate the evils of litigation as at present everywhere conducted, owing to the moral turpitude of suitors, who are unfortunately kept in countenance by the traditional morality of the bar. To secure the second desideratum, it is sufficient that the allegations be made before a judge acquainted with the legal qualities of facts, and who can at once pronounce whether they have those ascribed to them. Also, the convenience of the judicature, and the interests of justice require, that at this stage, in all but the simplest cases, advocates acquainted with the law, and accustomed to deal with complex facts, should be interposed between

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If the judge knows the law, and has the requisite power of attention, he is more likely to manage this part of the business with fidelity and efficiency, singly, than with co-adjutors sharing the responsibility of the task with him.

It appears that a single judge is the only agency required for the preparation of the case for proof. On the operation of leading proof, the reader may consult the articles on EVIDENCE, and TRIAL BY JURY. There appears to be little room for doubting that a single person of probity and ability, accustomed to taking and weighing evidence, is more likely to settle the question of fact satisfactorily than several persons, selected almost at random, as a jury, and unaccustomed to these operations. The question is between the value of the vague impression from the evidence received by these men, and that of the logical inference from it of an acute mind alive to all the little circumstances which affect the credibility of witnesses, and accustomed to compare evidence of different sorts, and sift contradictory evidence. As in the first operation, too, the responsibility of the task is greatest when resting on a single person. Since there is nothing in the third operation requiring more than one person for its performance, it appears that a single judge is the only agency required for all the three stages of judicial procedure.

It is unnecessary to enter particularly here into the provisions requisite to secure the fidelity of judges. Most of them must be inferred from the general provisions against offences to be hereafter discussed. Those at the head of the government must be guided by public opinion, in a large measure, in making appointments to the judicial seat. For the rest, the publicity of the judge's proceedings, and, particularly, the fact of their taking place before an audience of lawyers interested in his honestly discharging the judicial function, are among the best securities for his attention and rectitude. To this we add, the right of appealing against his judgment to a superior tribunal, as a great security against his negligence and unfairness. This right should be given to suitors in all cases in inferior tribunals. No reason can be assigned why it should be given in one case and not in another. The only consequence of giving it in all would be a necessity for a greater number of courts of appeal; but as there is no good reason why the judge on appeal should not be single, the number of superior judges required would probably not be greater than at present, on the system of divided responsibility. The appeal, also, might be simplified by the judgment in the superior courts proceeding on an authentic record of the proceedings in the inferior.

II. It must now be inquired how undisputed rights may best be guarded from violation, and how persons convicted of violating them should be dealt with. Though all wilful violations of rights come under the generic name of wrongs, only certain of those made penal are called crimes; yet it will be convenient to speak here indifferently of all acts to be prevented as crimes.

In inquiring how crimes are to be prevented, attention must, first of all, be given to their causes. The cause of every crime is the desire of some actual or imaginary good. A man is led to steal by the desire of property, and to injure another's person by resentment. Generally, the desires which cause crimes are the same that lead to other and necessary forms of human activity. And as they are essential to man's existence, the question is, What obstacles must be devised to prevent their leading to criminal acts, while leaving them free within legitimate limits?

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How they are to be counteracted.

The principle on which acts are to be selected for punishment.

Natural obstacles to crimes.

They lead to crimes unless they are counteracted by stronger motives, or the criminal acts are prevented by the interposition of physical force. It is clear that crimes cannot be prevented in more than a few cases by physical force. They must be prevented, then, by supplying motives to counteract the desires which lead to them; and, considering what these are, the counteracting motives must be desires for greater advantages than those obtainable by the criminal acts, or aversions to evils certain or likely to follow upon their commission. To supply motives of the former class would be to reward men for not committing crimes, and is wholly out of the question. It remains that the motives to crimes are to be counteracted by applying evil consequences to their commission.

But it is expedient that no evil be produced that does not, directly or indirectly, produce a greater good. This is the principle on which injurious acts are to be selected for prohibition in the penal code; and in applying it, regard must be had to all the consequences of making acts penal through which the influence of the penalties is diffused through society. The immediate consequences of making failure to pay a debt penal might be beneficial, but its consequences in the long run on trade and commerce would certainly be mischievous. One deduction from this principle is, that the protection of rights should be left to the fear of the direct evil consequences of violating them, whenever it is ordinarily sufficient to prevent their violation. Another obvious deduction is, that penalties should be annexed to no acts, the commission of which they are unsuited to prevent.

The direct evil consequences of injurious acts are the natural protections of the corresponding rights; they are obstacles to crime, existing in the nature of society and of man, which it is the duty of the legislature to uphold and strengthen. They either depend on the moral sensibilities of men, or on the immediate practical results of provoking their unfavourable sentiments. Over the area of the common experience that the largest measure of durable good is attainable only in the way of justice, the desires of individuals for happiness concurrently constitute an instinct in society of self-preservation from all who practice injustice, which not only secures that they shall be punished with odium in proportion to their sensibilities and the public estimate of their deserts, but that, when hardened to shame, they shall be ruined and cast out of society. The task of the legislator, so far, must be, to enlighten men's moral judgments, and stimulate and tutor their unfavourable sentiments by promulgating just views of criminality. But, further, he must take care that the unequal development of society shall nowhere efface or prevent the effects of those impressions of mutual hatred and esteem on which the moral tone of the community depends. Accordingly, wherever peculiarities of experience have generated false sentiments, that shelter one class of society from the indignation of the rest, it becomes the duty of the legislator to educate and reform that class, and to check the causes of vagabond and criminal habits which perpetuate the families of the morally obtuse. So far as religion constitutes a more awful morality, with more terrible, if less immediately obtrusive penalties, it is the duty of the legislator to foster a universal regard for its sanctions, and to cherish the general diffusion of its principles.

It will never be possible, however, so to train or elevate all that they shall feel the force of these natural obstacles, which also must often fail by defeating themselves. The aspiring classes, in all ranks, are particularly exposed to an unfavourable action of public opinion, being tempted, on their fortunes changing, to continue their upward progress by the secret avenues of fraud, lest they should appear ridiculous in suddenly descending from positions honestly attained. Also, so long as criminals can evade the natural

consequences of their crimes by shifting their localities, there must be other means of preventing crimes. Without indorsing the opinion that men are to be held in awe by the terror of physical pain alone, it will always be necessary to employ motives from the physical source to counterbalance the effects of the dissocial passions.

The evils incurred by transgressing the natural obstacles are due to the incongruity of crimes to the constitution of society. By increasing them ever so much no evil uncompensated for by a greater good can be produced; because they can only be increased by transfusing society with the sentiments essential to its well-being and stability—increasing the vigour of its system, so as more speedily to reject whatever is noxious to it; and because, as the evils increase, the occasions become less frequent of their being inflicted, from the diminution of the criminally disposed and greater efficacy of the obstacles. The evils incurred by transgressing the artificial obstacles, on the other hand, are created by the legislator, and are pure evils, unless they are successfully employed to prevent greater. His design, then, must be to prevent crimes by *threatening* to inflict these evils. When his threats do not prevent crimes, and the evils have to be actually inflicted, his design has failed. They are then to be inflicted to maintain the future efficacy of his threats.

According to this design, the first condition of the employment of punishments is, that they must be fixed and declared by law, so as to be standing menaces against the criminally disposed. The second condition depends on its being more desirable to prevent the more than the less mischievous crimes, and is, that the penalties declared by the law must be graduated to the scale of crimes, the former ascending in severity as the latter ascend in mischievousness. For, if the same penalty were threatened against crimes of different degrees of mischievousness, there would be nothing to deter a man from committing the more mischievous as often as it promised to be the more profitable.

Besides the principle of proportioning penalties to the mischievousness of crimes, none other is practically applicable; it is the single principle on which the relative severity of the punishments in different cases must depend. This will appear from a brief view of the only other principles that have ever pretended to determine penalties. It is out of the question proportioning punishment to the moral guilt or to the criminal intention of offenders; for, as the former is held to diminish as temptation increases, penalties on that principle should be least when, for the purpose of prevention, they should be greatest; and because it is impossible to measure the latter so as to proportion punishment to it. Nor can the principle be that of proportioning punishments to the motives which lead to crimes; because (1), there can be no measure of motives; and (2), even if motives could be measured, they would be no measures of the punishments sufficient to counteract them by producing fear. Motives to crimes rise from the concurrence of desirableness in objects obtainable by them with circumstances which diminish the difficulties and risks of committing them, and depend on the views taken by criminals of the whole circumstances under which they are committed. It is impossible to estimate either of these factors in motives as seen from the stand-point of criminals, far less the motives, as determined by their concurrence. This, even when the object has a market-value; but when it is the gratification of a sense, or passion, the estimate is wholly impossible. And even if we could appreciate motives, yet, since punishments cannot be made to follow immediately on crimes, and the causes by which they lose deterring force are beyond our cognizance, our measures of motives would be no guides in annexing penalties. The fear of punishment felt by a criminal, supposing him to deliberate, depends largely on his imagination and a calculation of chances based on his pre-

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vious experience and immediate means of concealment. An error in reasoning, or in the calculation of a probability, may take all the terror from the law. Also, in the majority of cases, the motives to crimes are wholly vague—as when a man breaks open a till or into a house. In fact, to apply this principle, the law, instead of aiming at generality, would have to address itself to each individual criminal, and punish him on an appreciation of the whole circumstances under which his crime was committed. But this would be to break through the first condition of the employment of punishments, and, leaving penalties to be determined by judges, leave to their discretion what laws, if any, should be enforced. It remains that penalties be proportioned to the mischievousness of offences.

Comparison of crimes in point of mischievousness.

It would be difficult to compare crimes in point of mischievousness were not incomparably their worst evil the feeling of insecurity which they produce; but by attending to this single effect of crimes exclusively, an approximate measure of their comparative mischievousness may be obtained. It would again be difficult to make direct appreciations of the extent of diffusion and degree of intensity of this feeling in different cases; but their measures may be indirectly obtained by comparing—1, The importance of the rights violated in different cases; 2, The difficulties of individuals guarding themselves from similar acts; and, 3, The spheres of operation of the desires leading to crimes of different sorts. In this way treason, putting the lives and property of all in danger, takes its place at the top of the scale; while petty thefts, causing little more than annoyance to the persons whose property is stolen, and exciting, when frequent, only the feeling of the necessity of greater care in storing things, take their place at the bottom. Between these all crimes whatever may readily be arranged. To compare theft, robbery, and burglary, for instance:—Thefts make property insecure, but raise no sense of personal danger; robberies, when frequent, add personal insecurity in going abroad to insecurity of property; to which burglaries, when frequent, add insecurity in staying at home. Again, supposing the motive, *i.e.*, so far as concerns the desirableness of the objects of the acts, in the three cases to be the same:—Theft waits opportunity; robbery makes opportunities; and burglary makes opportunities in defiance of all the ordinary protections of person and property. Murder for money, again, is more mischievous than when committed in the heat of passion. Passion is accidental between the criminal and his victim; but all desire money, and all who have it feel exposed to be murdered for it. While the mischievousness of crimes may be compared in this way, it is impossible to estimate precisely their differences in degrees of mischievousness. Beyond saying that in one case punishment should be greater than in another, theory can give the legislator no practical guidance; so that a large amount of arbitrariness must be admitted into this branch of law.

The doctrine of satisfaction.

So far we have seen how penalties are to be proportioned to crimes, but not how their sufficiency for the purpose of prevention is to be secured. Perhaps the nearest approach that could be made to securing their sufficiency would be to make part of the punishment, in every case in which it is practicable, consist in the criminal repairing the injury occasioned by his criminal act. When the injury is done to property or reputation, it may, in most cases, be repaired; and even when it is done to the person, a substitute for reparation may in many cases be exacted. Stretched to its full extent, the doctrine of satisfaction would require that the criminal should not only be made to compensate the person injured by his act, but to defray by his labour, or from his estate, the expenses of convicting and punishing him. But the extent to which the principle should be applied must be determined by expediency in the circumstances of cases.

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It remains to set forth the penalties available from the physical source, and the qualities which lots of punishment should have for the purposes of prevention. A man may be punished through his person directly—(1), by being subjected to bodily pain, or (2), to hard labour; and (3), by being deprived of his liberty; and, indirectly (4), by being deprived of his property. The punishments which he may be made to suffer in these ways may be made to vary—(1), between scourging and death; (2), between a brief term of hard labour and perpetual slavery; (3), between imprisonment for a brief term and for his natural life; (4), between a small fine and his whole fortune. Also, these punishments may be made up in an indefinite number of lots, by combining different degrees of the various sorts, so as to be of every degree of formidableness.

It appears, then, that these penalties possess the two Primary qualities most essential to punishment, *viz.*, formidableness and measureableness, so that they may be formed in lots increasing in severity with the classes of crimes which they are designed to prevent. The other qualities which a lot of punishment should have for the purpose of prevention are obvious. 1. It should be suggestive of the crime to which it is attached, that the idea of it may be closely associated with that of the crime. 2. It should be calculated to operate with the same intensity on all persons. 3. It should be disabling, *i.e.*, such as to prevent the criminal doing further injury to society.

Secondary to these qualities are others which a lot of Their punishment should have in the view of benevolence, and which bear only indirectly on the prevention of crime. 1. It ought to be humane, *i.e.*, occasion as little as possible useless suffering. 2. Corrective, tending to the moral improvement of the criminal. 3. Remediable, in case it should be discovered to have been undeserved. It must not be attempted, however, to give it these qualities at the expense of its formidableness, which benevolence indeed requires it to have, that the fear of it may prevent the necessity of inflicting it. Its sufficiency to prevent crime is what must chiefly be attended to. This, however, depends not wholly on its severity, but on the degree of expectation that it will be inflicted. The more severe the penalty is, this expectation being the same, the greater will be its deterring force; but, the penalty being the same, the less this expectation, the less effectual will the penalty be. Also, if its infliction is certain to be long delayed, it loses force, through the operation of psychological laws too well known to require explication here. So that the certainty of punishments being speedily inflicted is, it may be, of as great importance as their severity in determining their sufficiency. They may, accordingly, be made less severe in proportion as they are made proximate and certain.

Here must be noticed the fact, that a limit is set in the nature of things to the advantages, in a jurisprudential view, derivable from severe punishments, as their severity tends to diminish their certainty, through men's reluctance to cause others to suffer great pains. The more severe punishments are the more likely they are to be effective; but then, the more severe, the less likely they are to be inflicted; and the point is reached where what is gained by increase of severity is lost by increase of impunity. It is all the less necessary, too, that punishments should be severe, that one of their chief functions is to direct public disapprobation against offenders. It is due to their discharge of this function, that in countries remarkable for lenient penal laws, crime is as effectively prevented as in others where they are very severe.

It is probable that, when all has been done to secure the certainty and proximity of punishments, they may with safety be made exceedingly lenient. Among the means that may be employed to secure these are—1, The establishment of a vigilant police, to secure the speedy detection

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tion of criminals; 2, Of a system of public prosecutors, and of courts in which criminals may be tried without delay, to secure their speedy conviction; 3, Restriction of the Judge's discretion by defining the circumstances which may justify him in lightening punishments, among which should not be the plea of a "first offence," for which a first conviction is too often mistaken; 4, Restriction of the pleas on which punishments may be evaded,—when the plea is insanity, confinement in a public asylum should follow; 5, The full infliction in all cases of the penalties incurred by criminals. Let the law have rules for singular cases; but let its awards be in all cases definite, and certain to be inflicted. Such a practice as that recently adopted in this country of commuting punishments, and of giving criminals the chance of winning off parts of the penalties incurred by them, is contrary to the first principles of jurisprudence; and the only apology that can be made for it is that it originated in a desire to remedy the evils of a penal system far too severe.

Next to being made formidable by the concurrence of severity and certainty, it is important that punishments should be made equable. The more equable they can be made, plainly over the wider area will their deterring force be exerted. It is extremely difficult, however, owing to the varieties of complexion and condition presented by men in society, to give penalties any great degree of this quality. The same pecuniary fine may deprive a poor man of his whole fortune, and be no more to a rich one than he daily spends in pleasure. Imprisonment may be fatal to the prospects of a man in a middle station, while to the peasant, who, on the approach of winter, considers whether to retire to the union or the jail, so far from being a punishment, it is a favour. Hard labour is severe on men unaccustomed to it, but the ordinary fare of multitudes; and even transportation, a grievous calamity to some, is welcomed by others. It has been proposed that, to secure a high degree of this quality, a discretion should be given to judges to apportion punishments to the nature and condition of offenders. But, besides that it would be difficult for judges correctly to appreciate these, it would be contrary to the first condition of employing punishments to leave such a discretion with them.

Connected with the difficulty of making punishments equable is that of making them equally severe for the same crimes, even when, nominally, they are the same. It is simply impossible to attain equal severity in the same punishments inflicted in different places on different persons. Their severity in the last resort depends partly on governors of jails, but principally on turnkeys,—on coarse people and coarse machinery. The machines made to equalize punishments have failed; nor, had they succeeded on their part, would they have brought us near the equality which benevolence desiderates, and which could only be reached by punishing men proportionally to their sensitiveness and strength. The treadmill, Sir George Grey's crank, and other machines, are found to vary, as far as to require, in some cases, three times the labour per day necessary in others. When the crank is adjusted to require a few pounds force, it depends on the turnkey's care in oiling it whether it may not require several hundred. The differences also between criminals in point of skill and strength make it impossible to equalize punishments by prescribing the same amount of work to be done by different persons. All that can be effected is a rough approach to equality. The inequalities remaining must be borne as accidents of the system which the legislator is constrained to employ; they are in many cases compensated by its other accidents, and, at any rate, are as nothing to the whole consequences of crimes to convicts.

The most grievous part of punishment is, in many cases, its effect on the convict's relation to society, to which is partly due what truth there is in the saying, "Once a criminal,

always a criminal." The question, whether anything should be done by the legislator to save convicts from the social consequences of crimes, is a difficult one. The answer to it must depend on that to another, What would the effect of doing so be as regards the prevention of crimes? The reaction of society upon criminals leads them to war against it, and back to the dock; so that while the fear of it tends to prevent crime, itself tends to occasion it. This reaction cannot, however, be prevented; nor would it be desirable to prevent it, seeing that it acts to deter almost all from crime, and to propel to it only the few who have offended. Criminals cannot, then, be thrown back on society, and, at the same time, saved from the social consequences of their crimes. They can only be saved from them by being retained under the care of the state. But to save them in this way would be to let them drop out of society, and to extinguish all the minor differences of penalties, which would have no proportion to this single result of crimes. It would be as if there was the same penalty for all crimes which provoked this reaction, and no means of preventing men from committing the more mischievous as often as it promised to be the more profitable. And this argument will hold good till provisions are made for the gradual ascent into society of those who incur its decided enmity. As yet it is impossible to say whether such provisions can ever be made, or to pronounce on the propriety of attempting to make them. We desiderate a scientific analysis of full criminal statistics; and till that has been procured, these, and other questions concerning the treatment of convicts, must remain unsolved. At present the case of a criminal at war with society is as melancholy as it is helpless. Whatever private individuals may do to improve it, it seems contrary to principle that the legislator should interfere in such work. His business, on the contrary, must be to sharpen, by every means in his power, and guide the social instinct to which the position is due. And by such means, so far as yet appears, he will, in the long run, do most for the prevention of crimes.

The importance of correct information regarding the Criminal operation of penal laws is universally recognised; criminal statistics, when properly collected and interpreted, disclose the causes of crime, its progress, and the defects of the agencies for repressing it. But on none of these points can even an approximate conclusion be drawn from criminal statistics as at present collected; their *prima facie* evidence must be received with large reservation. And, for two reasons, the statistics of crime in Scotland should be selected as the basis of an explanation of the nature of these reservations; first, because of the smallness of its area and population, and next, because its agencies for the prosecution of offenders are more definite than those of England.

The only point that can here be touched upon respects the evidence of our criminal statistics as to the progress of crime. The statistics of crime in Scotland bearing on this point are confined to the numbers of commitments for trial and of convictions; and arguments on its progress proceed on comparisons of the commitments in different years. It would appear, at first sight, that the main body of crime in each year might safely be averaged to its number of commitments. But unless we know that the causes which affect commitments remain invariable over the years to be compared, we can have no security that this average may not be wholly erroneous. The importance of attending to the causes which affect the administration of justice is indicated by the striking variations in the differences between commitments and convictions in different years. Thus, out of 4027 commitments in 1852, were obtained only 3018 convictions, leaving 1009 crimes unaccounted for; while, out of 3019 in 1853, were obtained 2849 convictions, leaving only 260. And equally striking variations are presented in the differences between commitments and convictions in

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other years. To explain these variations, we should be able to point out the causes which make the zeal of the police and of procurators-fiscal for the prosecution of offenders, to exceed their care in preparing cases, and *vice versa*. Looking to the years 1852 and 1853, for example, it may have been that the fall of 1008 commitments for trial, and the disproportioned diminution of the difference between commitments and convictions, were due to the experience, in the former year, of the inutility of sending to trial cases in which convictions were not certain to be obtained. So far from crime being less in 1853 than in 1852, in the proportion of 4027 to 3019, it may have continued the same over the two years; and the convictions in the latter differ from those in the former by 169 only. But the strongest reason against arguing without reservation on the progress of crime from commitments for trial, lies in the returns made by the crown agent of undetected "housebreakings and other depredations on property," in 1854-55, which demonstrate that the main body of crime has hitherto always lain concealed. When corrected, by adding to them proportional numbers for the places from which no returns were made, they show that, in that year, the *whole* number of serious offences against property was, at least, more than eight times the convictions for such offences, and that the undetected crimes alone were more than quadruple the commitments. How these proportions may vary from year to year, is beyond our cognizance; but it is proved that the main body of crime is so great in proportion to the commitments, that the latter may be varied indefinitely from year to year by causes which affect them, without any corresponding variations necessarily taking place in the main body of crime. The limits of variation of commitments are so wide short of exhausting crime, that no inference can reasonably be drawn from them as to its progress. This will farther appear, if attention is given to the commitments for trial during the last twenty years, and to the variations in the principal causes affecting them that have occurred in that interval, viz., in the police force and constabulary, and the system of procurators-fiscal. Commitments took a start in 1841, the average for the years 1841-45 being 347 above that for the years 1836-40. They again took a start in 1846, the average

for the years 1845-50 being 792 above the average for 1840-45; and, since 1850, the average has been lowering. Now, it is noticeable that 1840 is the date of the act empowering the establishment of the county constabulary, which attained its highest degree of efficiency about 1846; and that the zeal of a large batch of procurators-fiscal for the prosecution of offenders was cooled in 1850 by their being put upon fixed salaries. Who will undertake to say how far these circumstances have had to do with the apparent advance and retrogression of crime? And till we can say how changes in the prosecuting agencies affect the commitments, they are valueless as indications of its progress. In fact, criminal statistics, as at present collected, give us, in commitments for trial, convictions, and prison statistics, measures not of crime but of the pressure upon it, of the state machinery for repressing it; and in order to get from them approximate measures of the variations in crime itself, we should be able to modify them by adding to or subtracting from them such numbers as may represent the effects of such variations as take place in that machinery. And in attempting to interpret them when thus modified, to ascertain from them whether crime is advancing or retrograding, the manner in which crime and the state machinery act and react on one another should not be lost sight of. A downward tendency in the commitments, so far as due to the impaired efficiency of that machinery, must be attended by an upward tendency in crime through the increase of impunity, and *vice versa*. So that the true conclusion as to the progress of crime *may* be the opposite of that which even the corrected statistics are, on a first view, calculated to suggest. And this holds, notwithstanding that an upward tendency in crime must be accompanied by a tendency towards improvement in the state machinery for repressing it through the increase of the feeling of insecurity. For the impression of impunity affects crime more rapidly than the sense of insecurity affects the agencies for repressing it. The former, as it were, affects criminals individually and at once; but the latter, notwithstanding the sensitiveness of modern society, must acquire a considerable degree of intensity, and be felt for a considerable time before it can effect changes in the state machinery. (J.F.M'L.)

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I.—*Ideas involved in the term Law.—These ideas how modified in the term Law of Nations.—The only sanction applicable to the Law of Nations is the popular sanction.—What dependence may be placed upon the popular sanction.*

IN the meaning of the word Law, three principal ideas are involved; that of a command, that of a sanction, and that of the authority from which the command proceeds.

Every law imports that something is to be done, or to be left undone.

But a command is impotent, unless there is the power of enforcing it. The power of enforcing a command is the power of inflicting penalties if the command is not obeyed. And the applicability of the penalties constitutes the sanction.

There is more difficulty in conveying an exact conception of the authority which is necessary to give existence to a law. It is evident that it is not every command, enforced by penalties, to which we should extend such a title. A law is not confined to a single act; it embraces a class of acts: it is not confined to the acts of one man; it embraces those of a community of men. And the authority from which it emanates must be an authority which that community are in the habit of obeying. An autho-

riety to which only a temporary obedience is paid, does not come up to the notion of that authority which is requisite to give existence to laws; for thus the commands of a hostile army, committing plunder, would be laws.

The conditions which we have thus described may all be visibly traced in the laws which governments lay down for the communities to which they belong. There we observe *the command*, there *the punishment* prescribed for its violation, and there *the commanding authority* to which obedience is habitually paid.

Of these conditions, how many can be said to belong to any thing included under the term Law of Nations?

By that term is understood, something which either does, or which, it is supposed, ought to bind the conduct of one nation towards another.

But it is not understood that one nation has a right to command another. When one nation can be commanded by another, it is dependent upon that other; and the laws of dependence are different from those which we are at present considering. An independent nation would resent, instead of obeying, a command delivered to it by another. Neither can it properly be said that nations, taken aggregately, prescribe those laws to one another severally; for when did they ever combine in any such prescription? When did they ever combine to vindicate the violations of

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them? It is therefore clear, that the term command cannot be applied, at least in the ordinary sense, to the laws of nations.

In the next place, it would not seem that any thing deserving the name of sanction belongs to them. Sanction, we have already seen, is punishment. Suppose nations to threaten one another with punishment, for the violation of any thing understood to be a law of nations. To punish implies superiority of strength. For the strong, therefore, the law of nations may perhaps have a sanction as against the weak. But what can it have as against the strong? Is it the strong, however, or is it the weak, by whom it is most liable to be violated? The answer is obvious and undeniable. As against those from whom almost solely any violation of the laws of nations need be apprehended, there appears, therefore, to be no sanction at all.

If it be said that several nations may combine to give it a sanction in favour of the weak, we might, for a practical answer, appeal to experience. Has it been done? Have nations in reality combined, so constantly and steadily, in favour of the law of nations, as to create, by the certainty of punishment, an overpowering motive to unjust powers, to abstain from its violation? For, as the laws against murder would have no efficacy if the punishment prescribed were not applied once in fifty or a hundred times, so the penalty against the violations of the law of nations can have no efficacy if it is applied unsteadily and rarely.

On the mode in which it has been applied, we may appeal to a great authority. Montesquieu says, "Le droit public est plus connu en Europe qu'en Asie : cependant on peut dire que les passions des princes, la patience des peuples, la flatterie des écrivains, en ont corrompu tous les principes. Ce droit, tel qu'il est aujourd'hui, est une science qui apprend aux princes jusqu'à quel point ils peuvent violer la justice, sans choquer leurs intérêts." (*Lettres Persanes*, xciv.)

To go a little deeper, we may consider whether the interest of nations, that which in the long run governs them all, can ever produce combinations, from which an effectual sanction, of the nature in question, can be expected to proceed. That they would derive some advantage from the general observation of those maxims which have been called laws of nations, frivolous as are the points upon which the greater part of them turn, cannot be denied. These advantages, however, are seen at a distance, and with the mind's eye; they are speculative rather than sensible. The inconveniences, on the other hand, which must result from any movement to lend effect to the law of nations, are immediate and formidable; the whole train of the evils of war are almost sure to arise from them. The latter class of impressions must, in general, be far more powerful than the former; and thus the interposition in favour of the law of nations will generally be shunned. A nation is often but too easily stimulated to make war in resentment of injuries done to itself. But it looks with too much coolness upon the injuries done to other nations, to incur the chance of any great inconvenience for the redress of them.

Besides, the object is to be gained by the means of combination. But the combinations of nations are very difficult things. Nations hardly ever combine without quarrelling.

Again, all nations ought to combine for an object common to all. But for all nations to combine in any one enterprise is impossible. Suppose a prince to have violated the law of nations, it would be absurd to suppose that all the countries on earth should conspire to punish him. But if not all, what is to be the selection? Who shall come forward; who stand excused? By those who are condemned to the sacrifice, in what proportion are the con-

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tributions to be made? Who is to afford the greatest, and who may come with the least?

It is unnecessary to pursue any farther the analysis of this extraordinary hypothesis. It is evident, from what has been said, that it is full of impracticabilities.

Are we, then, obliged to consider the maxims or rules which pass under the name of Laws of Nations, as utterly without force and influence; and the discourse which is made about them as mere affectation and impertinence?

Not wholly so. It is of use that the ordinary intercourse of nations should be conducted according to certain forms, generally known and approved; because they will be observed on all occasions when there is no particular motive to violate them, and will often prevent disputes which might arise on frivolous occasions. They resemble in this respect the ceremonial of a court, or the established forms of polished society.

The objects, however, which are understood to be embraced by the law of nations, are of two sorts. The first are those minor objects which partake more of form than of substance; the other are objects which deeply affect humanity. That there are certain interests of nations, which it were good to have considered as their rights, and of which it is infinitely to be desired that the violation could be prevented, is most true. But if national law has no penalty annexed to it; if the weaker party who is wronged has no means of redress, where, it may be said, is the advantage of such a law? Or where the propriety of calling that a law which is only a declaration respecting rights; violated by the more powerful party with impunity, as often, and to as great an extent, as he pleases?

There is still, however, a power which, though it be not the physical force either of one state or of a combination of states, applied to vindicate a violation of the law of nations, is not without a great sway in human affairs; and which, as it is very nearly the whole of the power which can be applied to secure the observation of that law, deserves to be carefully considered, that, by duly appreciating its efficacy in this important affair, we may neither trust to it where it will disappoint our expectation, nor neglect the use of it where it may be turned to advantage.

That the human mind is powerfully acted upon by the approbation or disapprobation, by the praise or blame, the contempt and hatred, or the love and admiration, of the rest of mankind, is a matter of fact, which, however it may be accounted for, is beyond the limits of dispute. Over the whole field of morality, with the exception of that narrow part which is protected by penal laws, it is the only power which binds to good conduct, and renders man agreeable and useful to man. It is evident, also, that where there is not great inequality, it is a power, the binding force of which must be necessarily great; because every individual, considered in himself, is weak and helpless as compared with the rest of the community. Unless, therefore, he can prevail upon them to abstain from injuring him, he must be exposed to unlimited suffering. And if, on the other hand, he can prevail upon them to combine in doing, or in desiring to do, him good, he is put in the way of receiving perpetually the greatest advantages. His motive, therefore, to obtain the favourable and to avoid the unfavourable regards of the members of the society in which he lives, is of the highest order. But he can obtain their favourable, and avoid their unfavourable sentiments, only by abstaining, with scrupulous anxiety, from doing any injury to them, and observing all such modes of conduct as are calculated to be useful and agreeable to them.

The value which men set upon these favourable regards of the persons among whom they live, is strikingly manifested by some of the most ordinary forms of their dis-

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course and behaviour. What is more esteemed than character? What injury reckoned more deep and unpardonable, than that of the man who exerts himself to take away unworthily any part of the reputation of his neighbours? But what is character, if not the title to the favourable sentiments of other men? And what is the loss of character, but the opinion of other men that we do not deserve those favourable sentiments with which they have been accustomed to regard us?

Honour and shame, those emotions, the intensity of which is proved by so many phenomena of human life, are but the feelings which attend upon those different situations. When a man finds himself in possession of the love, the esteem, and admiration of those by whom he is surrounded, he is filled with that delight which the belief of the secure possession of a great source of benefit cannot fail to inspire: he is fearless, elated, and confident; the principal characteristics of that state of mind which we denominate pride. When he is conscious, on the other hand, of having forfeited in any degree the favourable sentiments of those among whom he lives, he suffers that depression which the loss of a highly valued possession is calculated to create; he ceases, in some degree, to look forward to his fellow-men for good, and feels more or less the apprehension of evil at their hands; he fears to prove how far their disapprobation of him reaches, or to excite them to define it too accurately for themselves; he hangs down his head, and dares not so much as look them in the face.

When men are favourably situated for having those impressions deeply struck, or, more correctly speaking, when those combinations of ideas have consistently and habitually been presented to their minds, the association becomes at last so indissoluble and strong, as to operate, even where the connection among the things themselves may not exist.

When persons who have been educated in a virtuous society have, from their infancy, associated the idea of certain actions with the favourable sentiments, and all the advantages which flow from the favourable sentiments, of mankind; and, on the other hand, have associated the idea of certain other actions with the unfavourable sentiments, and all the disadvantages which flow from the unfavourable sentiments, of mankind; so painful a feeling comes in time to be raised in them at the very thought of any such action, that they recoil from the perpetration of it, even in cases in which they may be perfectly secure against any unfavourable sentiments which it might be calculated to inspire.

It will, we apprehend, upon the most accurate investigation, be found, that this is the only power to which we can look for any considerable sanction to the laws of nations; for almost the only species of punishment to which the violation of them can ever become amenable: it is the only security, therefore, which mankind can ever enjoy for the benefit which laws, well contrived for this purpose, might be calculated to yield.

It is, in the next place, incumbent upon us to inquire, what dependence can be placed upon this security, in the set of cases now under consideration; and in what circumstances it is calculated to act with the greatest, in what with the least efficacy, towards this important end.

A power which is wholly derived from the good which may follow the favourable, the evil which may follow the unfavourable, sentiments of mankind, will act most efficaciously upon him who is the most, least efficaciously upon him who is the least, exposed to receive good and evil from the immediate inclination of his fellow-men.

It seems to be evident, that he who is most weak, as compared with the rest of the community, is the most exposed to receive good or evil in consequence of their fa-

vourable or unfavourable sentiments; and that he, on the other hand, who is the most powerful, as compared with them, is the least exposed to receive good or evil in consequence of those sentiments.

When men are nearly upon equality, no one has any chance of inducing other people to abstain from hurting him, but by his abstaining from doing hurt in any way to them. He has no means of inducing them to do him any acts of service, but by their expectation of receiving similar acts of service from him. He is, therefore, intensely interested in its being generally believed of him, that he is a man who is careful to abstain from injuring, and ever ready to exert himself to do services to others.

The case is exceedingly different where one man is lifted high above others. In that case, he has powerful means of protection against their hurtful acts, powerful means of obtaining their services, altogether independent of his conduct, altogether independent of his disposition either to abstain from injuring them, or to render them service.

So far, therefore, as good conduct arises from a man's dependence upon the sentiments of others; and from this is derived the moral power, to which alone the term moral sanction or obligation can properly belong; the security for good conduct is apt to be lessened, in exact proportion as any one is raised above the level of those composing the mass of the community. If any man possesses absolute power over the rest of the community, he is set free from all dependence upon their sentiments. In this, or nearly in this situation, is every despot having a well-established authority. So far as a man is educated as a despot, he can therefore have but few of those associations on which a conduct beneficent to others depends. He is not accustomed to look, for the services which he needs, or the evils which he apprehends, from others, to the opinion which they may entertain of the goodness or badness of his conduct; he cannot, therefore, have that salutary train of transitions from the idea of an evil act to that of the condemnatory sentiments of mankind, and from the condemnatory sentiments of mankind to the forfeiture of all those delights and advantages which spring to him from the operation of their favourable regards; associations which in men favourably situated become at last habitual, and govern the conduct, as it were mechanically, without any distinct recurrence to the consequences, upon the thought of which, nevertheless, this salutary and ennobling sentiment ultimately depends, and from which it has been originally derived.

If such is the situation of the despot with regard to these important associations, it is in a proportional degree the situation of all those who partake of that species of elevation. In an aristocratical country, for example, a country in which there is great inequality of wealth, those who possess the large fortunes are raised to a great degree above any chance of receiving evil, or of standing deprived of any good, because the great mass, the lower orders, of their countrymen, think unfavourably of them. They are, no doubt, to a considerable degree dependent upon what the people of their own class may think of them; and it is accordingly found, that those qualities and acts which are useful to that class are formed into a particular, an aristocratical code of morality, which is very effectually sanctioned by the favourable and unfavourable sentiments of the aristocratical body, at the same time that it is exceedingly different from that more enlarged and all-comprehensive code, on which the happiness of the greatest number depends, and to which alone the epithet moral in propriety belongs.

Such being the state of the facts connected with this important case, it remains to see what are the inferences bearing upon it which we are entitled to draw from them.

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We have already ascertained, that the only power which can operate to sanction the laws of nations, in other words, to reward or punish any nation, according as it obeys or as it disobeys them, is the approbation and disapprobation of mankind. It follows, that the restraining force is, in this case, determined by the associations which they who govern it may have formed with the approbation and disapprobation of mankind. If they have formed strong associations of a pleasurable kind with the approbation, strong associations of the painful kind with the disapprobation, of mankind, the restraining force will be great; if they have not formed such associations, it will be feeble and insignificant. It has, however, appeared, immediately above, that the rulers of a country, of which the government is either monarchical or aristocratical, can have these associations in but a very low degree; as those alone, who are placed on a level with the great body of other men, are placed in circumstances calculated to produce them. It is only then in countries, the rulers of which are drawn from the mass of the people, in other words, in democratical countries, that the sanction of the laws of nations can be expected to operate with any considerable effect.

II.—*What is required to give to the Law of Nations its greatest perfection.—Necessity for a Code of International Law.—Rights of Nations.*

Having thus ascertained what is the power which restrains from violating the laws of nations, and what the description of rulers upon whom its restraining force is the greatest, we are next to inquire by what expedients the force of it may be raised to the greatest pitch, and the greatest amount of benefit may be derived from it.

It is sufficiently recognised, that whatever is intended to produce any effect as a punishment, produces it in a greater degree, in proportion as it operates with greater precision and certainty. The inquiry, then, regards the means of giving precision and certainty to those sentiments of the world, on which the binding power of the laws of nations so greatly depends.

Two things are necessary to give precision and certainty to the operation of laws within a community. The one is a strict determination of what the law is; the second, a tribunal so constituted as to yield prompt and accurate execution to the law. It is evident that these two are indispensable requisites. Without them no penalties can operate with either precision or certainty. And the case is evidently the same, whether we speak of the laws which regulate the actions of individual and individual within the state, or those which regulate the actions of one state towards another.

It is obvious to remark, in the first place, that, with regard to the laws of nations, not one of those two indispensable requisites has ever yet had any existence. It has neither been determined what the laws in question are, nor has any common tribunal for cognizance of the violations of them ever been constituted. With respect to the last, not so much as the idea of it seems to have been entertained. And with respect to the first, though much has been written, it has been almost wholly in the way of vague and general discourse. Hardly a single accurate definition has yet been applied to any part of the subject.

Here, then, we come to what is obviously the grand inquiry; namely, *first*, what can be done towards defining the laws of nations? and, *secondly*, what can be done towards providing a tribunal for yielding prompt and accurate decisions in conformity with them? in other words, for applying with the greatest possible efficacy the opinion of the world for restraining the violation of them?

In the preceding article, to which it is necessary for us

here to revert, we have sufficiently made it appear, that the foundation of all law is the constitution of rights. Of two parties, unless it is previously determined what each shall enjoy, it can never be determined whether one has improperly disturbed the enjoyment of the other. To determine, however, what a party is to enjoy, is to determine his rights.

Now then, with regard to nations, the question is, what ought to be constituted rights? or, in other words, what would it be desirable for the good of mankind upon the whole, that the several nations should respect as the rights of each other?

This, it is pretty obvious, is one of the most extensive of all inquiries, far exceeding the limits of an article in the present work. We can attempt little more than to show the way in which the inquiry may be carried on.

In the preceding article, we have endeavoured to clear up the meaning which in legislation can, without leading to confusion, be alone attached to the term *rights*; and we have there likewise seen, that there are but two classes of objects in which individuals can have rights, namely, things and persons.

The case, we believe, will be found the same with respect to nations. They also can have rights in nothing but persons and things. Of course it follows that they can receive injury in nothing but in persons or things.

The inquiry, however, with respect to the rights of nations, is not so simple as that with respect to the rights of individuals; because, between individuals subject to the same system of laws, the legislature recognises no state of hostility; but between nations there is the state of war and the state of peace, and the rights which are understood to belong to nations are different in these two different states. In the state of war, nations recognise in one another very few rights respecting either persons or things; they kill the one, and take and destroy the other, with little other limit than the want of ability. In the state of peace they respect as rights belonging to one another, nearly the same things which are constituted rights of individuals, by the ordinary systems of national law.

III.—*What should be recognised as Rights in time of Peace.—The Property of Individuals.—The Persons of Individuals.—The Property or Dominion of the State.—Dominion in Land.—Dominion in Water.*

We shall begin with the consideration of those things which it would be desirable that nations should respect as the rights of one another in the time of peace.

And, *first*, of rights with respect to things. As the subject of the rights of nations, things may be divided into two sorts; things belonging to some individual member of the nation, and things belonging to the nation in its collective or corporate capacity.

Those rights in things which the nation guarantees to its individual members within the nation, it would be desirable, with hardly any exception, that nations should respect in regard to one another; that those things, for example, which the government of the country to which a man belongs, would regard, and would compel all its subjects to regard, as his property, the governments of all other countries should respect, and compel all their subjects to respect as his property.

There are two states of circumstances in which questions may arise between nations, respecting the property of their respective subjects. The first, where the property in question, when the cause of dispute arises, is within the country of the individual to whom it belongs. The second, where the property has by its owner been previously removed into the foreign country, with which, or some of the inhabitants of which, the dispute has arisen.

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1. The first set of circumstances exists between two conterminous countries, the bordering inhabitants of which being neighbours to one another, may, as any other neighbours, infringe the properties of one another. The proper mode of settling these disputes seems to be sufficiently obvious. The rights of the party complaining should be adjudged according to the laws of the country to which he belongs. But the party sued or prosecuted should be amenable only to the tribunals of the country to which he belongs; that is to say, the question should be tried before the tribunals of the country of the defendant; but the definition of the right in question should be taken from the law of the country to which the plaintiff belongs. It might in some cases be convenient for countries in this situation to agree in constituting a common judicature, appropriated to these disputes, to consist, for example, of two judges, one of each country, with power to choose a third when they could not agree.

The injury complained of may be capable of redress by a remedy of the nature of a civil suit merely; or it may be of that more atrocious sort, theft or robbery, for which the remedy of punishment is required.

It would appear that punishment ought to be apportioned according to the laws of the country to which the party who has incurred it belongs. Whatever would be the punishment decreed for the offence, if committed against a man of his own country, such a punishment he ought to sustain for the offence against the man of the other country. The question of punishment is here understood as extraneous to that of compensation. This ought always to be made to the party injured, where it is capable of being made, and in a case of property it is always capable; if not by the author of the injury, from want of property, or other cause, at least by the government of the country to which he belongs.

2. Where a man has removed his property from his own into another country, there seems to be no peculiar reason why it should be regulated by any other laws than those of the country into which he has removed it; why the rights which it confers should be otherwise determined, or the violation of them otherwise punished.

We have now considered, though in a very general manner (and our limits preclude us from attempting any thing more), the mode in which nations should agree about the rights of one another (in other words, the laws they should establish), in as far as the property of individuals belonging to them is concerned. After the *property* of individuals, their *persons* are to be considered as requiring the protection of laws.

There is more difficulty in determining what is desirable, as international law, with regard to this part of the subject, than that which regards the property of individuals. It is desirable that the persons of the inhabitants of every country should receive protection according to the laws of their own country; but it is also desirable that each man should sustain punishment according to the laws of his country; and these two objects are to a certain extent inconsistent with one another.

The inconvenience, however, seems to be greater, in permitting the inhabitants of one country to be punished according to the laws of another, than in leaving the inhabitants of one country to the same measure of protection against injury to their persons from the inhabitants of other countries, as is afforded to the inhabitants of those countries by their own laws. Many cases, indeed, may be conceived, in which this is a measure of protection which all reasonable men would allow to be inadequate. In such cases, however, the only remedy seems to be the formation of a compact, by which a mode of proceeding, agreeable to the sentiments of both parties, may be positively prescribed. This latter expedient is of course extraneous

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to that equitable construction which ought to be uniformly applied by the tribunals of one country to the injuries perpetrated, by those whom they may have to judge, upon the inhabitants of another country. If an inhabitant of Persia, for example, should force cow-broth down the throat of an inhabitant and native of Hindustan, the tribunals of Persia should not punish this outrage as they would punish one Persian for making another swallow the same liquid. To the Persian it would be a trifling injury, and more than a trifling punishment would not be required. To the Hindu it would be one of the greatest of all conceivable injuries. It ought to be, therefore, put upon the same footing with an injury of an equal degree done to a Persian; the nature of the injury, not the external act, should be the object of consideration; and whatever the punishment which would be awarded against a Persian for one of the greatest injuries of which he could be guilty to a Persian, the same ought to be inflicted upon him for this, one of the greatest which he could occasion to a Hindu.

Besides the cases in which a government, as representative of the country, may be injured through the individuals who live under its protection, there are cases in which it may be injured more directly. Certain things belong as property to the government, without belonging to any individual; and there are persons, members of the government, or agents of the government, who may receive injuries in that capacity, distinct from those which affect them as private individuals. These are the cases to which it now remains that we direct our attention.

Those things which belong to government as goods and chattels; its moveables, for example; or the lands which it holds, as any individual holds them, in the way of an estate; there seems to be no reason for considering as subject to any other rules than those applicable to the goods and chattels which belong to individuals.

Of other things, those to which any government can claim a right, as representative of a nation, must be either, first, portions of land, or, secondly, portions of water.

1. The questions which relate to the rights which any nation may claim in any portion of land, are questions regarding boundaries; and these involve the whole of the questions respecting the acquisition of dominion.

To have any standard for determining questions with regard to dominion, the different modes of acquiring dominion must be recognised; those which are proper to be allowed and respected by other nations must be distinguished from those which are improper, must be accurately defined, and the definitions made known.

For this purpose it is easy to perceive that the same process is necessary as that for the definition of rights, described in the section JURISPRUDENCE of the preceding article to which we must again refer.

It is necessary, according to that example, that the events which are to be considered as giving commencement to a right of dominion, and those which are to be considered as putting an end to it, should be fully enumerated, and accurately defined.

This is the first part of the process. The other part is, to distinguish the different degrees of dominion. There is a dominion which is perfect, which includes every power over the subject in question, and leaves nothing farther to be acquired, a *dominium plenum*; there is also a dominion, which is but the commencement, as it were, of dominion, and includes the smallest possible fragment of a full dominion. These are the two extremes; and between them are various distinguishable degrees. All these should be fully enumerated, and accurately defined.

When any of those events occurs which are to be considered as giving commencement to rights, it often happens that they are accompanied by circumstances which limit the right they would otherwise convey, and render

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the dominion less than full. These circumstances ought also to be completely enumerated, and the power of each to be accurately defined.

If this were done, an international code would be composed, in which the rights of dominion would be accurately defined; and to determine any question about boundaries, or about the degree of dominion, nothing farther would then be necessary than an adequate inquiry respecting the state of the facts.

The questions would exactly resemble those which we have already described in the preceding article in analyzing what is called pleading in judicature. In a question about boundaries there is, let us suppose, a district over which one country affirms that it has a right of dominion, a dominion more or less complete, and another country denies that it has that right. The first question is, whether any of those events has occurred which would give the affirming country a right of dominion? The second question is, whether, if such an event had occurred, it was accompanied with any of those circumstances which limit dominion, and render it less than full; and if so, under what degree of limiting power they are classed? The third question is, whether, if an event thus giving commencement to a right of dominion had occurred, any other event putting an end to that right had subsequently occurred?

We need not here enlarge upon these several topics, because they will be sufficiently understood by those readers who bear in mind the expositions already given in the article referred to; and to those who do not, we suggest the propriety of recurring to that article, as a preparation for the perusal of this.

It is evidently disproportionate to the limits which we must here prescribe to ourselves, to enumerate the events which it would be agreeable to the interests of mankind in general that nations should regard as giving, and alone giving, commencement and termination to rights of dominion, because, in order to afford an enumeration which would be in any degree instructive, the reasons must be given why one set of events, and not another, should have the privilege in question conferred upon them.

It may be proper, however, in the mean time, to observe, that the events in question will not be found to be numerous, nor very difficult to discover. In fact they are, and among civilized nations almost always have been, pretty nearly agreed upon; and they are the questions of modification, and questions of fact, upon which chiefly differences have arisen. For example, there is no dispute that occupancy, where there is no prior right, is an event which should be considered as giving commencement to a right of dominion. Neither is there any doubt that the consent of those who have a right may transfer that right to others; or, in other words, that such consent is an event which gives commencement to a right in those others. Conquest, also, made in a lawful war, is recognised as an event of the same description; and it will be found upon inquiry that these do in fact constitute the whole. For, on every occasion on which dominion is acquired, the territory so acquired must beforehand either have belonged to somebody, or have belonged to nobody. If it belonged to nobody, occupancy is the only event which can be supposed to give commencement to the right. If it belonged to somebody, it must be taken from him, either willingly or by force. If it is taken from him willingly, we have his consent. If it is taken by force, it is by conquest in war that the new right is created.

It is evidently, however, farther necessary, that the different species of consent should be distinguished, and those to which it would be proper to attach this investitive power separated accurately from those from which it should be withheld. It is here, accordingly, that the

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doctrine of contracts would need to be introduced; that the different species of them applicable to this subject, in which all treaties would be included, should be enumerated; that the effects proper to be given to each of them should be defined; and the mode of interpreting them, or fixing the sense which they ought to bear, accurately laid down.

It would also be expedient, after the principal contracts applicable to international concerns are ascertained, to exhibit in the international code, *formule*, with blanks to be filled up, which should be employed by nations on all occasions of such contracts; and, being framed with the greatest possible accuracy, would go as far as it would be possible by words to go, in excluding ambiguity and the grounds of dispute.

With respect to conquest, the last event calculated to give commencement to rights of dominion mentioned in the above general enumeration, it is allowed, that as there are some conquests which ought not to be considered as conferring rights of dominion, there are others which ought to be considered as doing so. It is evidently necessary, therefore, that the line of separation should be drawn.

Whether a conquest, however, should or should not be considered as conferring a right of dominion, depends very much upon the nature of the war through which it is made. If the war be what is regarded as just, and the mode of warfare conformable to the recognised rules, the conquest is apt to be regarded as conferring a legitimate title; if the war, and mode of war, be of a contrary description, the validity of the title conferred by the conquest may be liable to dispute.

It is evident, therefore, that in order to define the species of conquest on which the investitive power in question should be conferred, the circumstances which render a war justifiable, and the mode in which it is justifiable to carry it on, must first be ascertained. This forms the second part of our inquiry; and the question regarding the investitive power of conquest must be deferred till that inquiry is performed.

2. Having thus far considered the mode in which should be determined the rights which nations acquire over portions of territory or land, it remains that we consider the mode in which their rights should be determined with regard to waters.

Waters, as concerns the present purpose, are either rivers or the sea.

As the sea involves the questions of greatest extent and importance, we shall attend to that part of the subject first.

Even in the language of ordinary discourse, the sea is denominated the common domain of nations.

The first principle with regard to the sea is this, that all nations have an equal right to the use of it. The utility of recognising this principle is so apparent, that it has never been the subject of any dispute. And all the rights assigned to nations severally in the enjoyment of this common domain ought to rise out of this principle, and to be limited by it. Whatever use any nation makes of it, should be such as not to prevent a similar and equal use from being made by other nations. And every use which cannot be shown to have that effect, should be recognised as a right by the law of nations.

The principal use which nations make of the sea is that of a passage for their ships. Agreeably to the principle which we have recognised, the ships of one nation should pass in such a manner as not to obstruct the passage of those of another. The rules according to which the possible cases of interference should be regulated are very simple, and are, in fact, laid down and acted upon with considerable accuracy. They resemble in all respects those according to which the vessels of the same country are made to avoid and to regulate their interferences in

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the rivers of the country, or upon its coasts. There would be no difficulty, therefore, in making accurate definitions of the requisite rights, for insertion in the international code.

The rights being established, the violations of them should be punished, on the same principles as those which we have laid down in regard to the preceding cases. Either property has been injured, or persons. In either case, compensation is an indisputable part of the remedial process, wherever it is practicable. In loss of property it is fully practicable. It is also practicable in many of the injuries done to the person. As in the case of offences committed on land, the rights of the individual who has suffered should be estimated according to the laws of the country to which he belongs; but the punishment of the offender should be measured according to the laws of the country to which he belongs. In the case of piracy, which is robbery or murder committed by persons whom no country recognises, and upon whom, therefore, justice can be demanded from no foreign government, it has hitherto been the practice that the nation suffering has taken the punishment into its own hands. Accordingly, the punishment of piracy has always been extremely severe. It would be no doubt better if a mode were adopted by which it would not be necessary for a nation to be judge in its own cause. A rule does not seem impossible to be framed, according to which the punishment of piracy might be provided for, by referring those accused of it either to some general tribunal constituted for that purpose, or to the tribunals of some nation other than that against which the offence has been perpetrated. A general law on this subject, to be observed by all nations, would be highly desirable.

Rules, therefore, seem not difficult to be laid down for regulating the proceedings of nations on the high seas. A distinction, however, is drawn between what is called the *high*, and what is called the *narrow seas*. By the narrow seas is commonly meant some portion of sea to a greater or less extent immediately surrounding a particular country, and in which that country claims peculiar privileges. The question is, whether any such privileges should be allowed, and, if allowed, to what extent?

The regulating principle in this, as in other cases, is the general advantage, the principle of utility. There are cases in which certain privileges in the waters surrounding a particular country are of so much importance to that country, and the exercise of those advantages occasions so very little inconvenience to other nations, that what is lost by all of them taken together bears no comparison with what is gained by that particular nation. In these cases the exercise of such privileges should be allowed; they should, however, be defined, in as many instances as possible, and promulgated by insertion in an international code.

Of the privileges in question, are all those which are essential, or to a considerable degree subservient, to the national security. In some cases the exclusive right of fishing might perhaps come under the same rule. But this is in general provided for by the necessity of drawing the nets, or curing the fish, upon the land, a privilege which, of course, it is in the power of any nation to give or to withhold.

In obedience to this equitable principle, it appears that such foppish privileges as have sometimes been insisted upon, affording no advantage to one nation which is not wholly at the cost of others (lowering the flag, for example, and such like impositions), should not be recognised by the code of nations.

It appears, also, that those tolls which have been sometimes and are levied at the narrow inlets of some seas, deserve to fall under the same condemnation. The passage through these inlets is a common good to all the nations

of the earth which may have a motive to use them, a good of the highest importance to the nations which are situated within, and to which it is the only means of maritime communication; and, while it imparts no evil to the conterminous nation, the toll which that nation levies is an advantage obtained wholly at the cost of others, and imposing upon them a burden, in the way of obstruction and trouble, which is compensated for by advantage to nobody.

The waters, we have said, in respect to which rights should be assigned to nations, are rivers and the sea. Having stated what appears necessary on the present occasion with respect to the sea, it remains that we offer the few observations required on the subject of rivers.

Rivers are either the boundary between two countries, or they are wholly within a particular country.

Those which are wholly within a particular country, it seems most agreeable to the principle of utility to regard as wholly belonging to that country. In the case of navigable rivers which pass through several countries, it would indeed be desirable for those countries which are situated higher up than at the mouth of each, as well as for all those who might thus have intercourse with them, that the navigation of such rivers should be free; but it would be difficult so to regulate this right, as not to affect the security of the country through which a free navigation should thus be allowed; and a slight diminution in its security would be so great a loss to that country as would require, to compensate for it, a very great advantage to those by whom the navigation was enjoyed. Unless where this advantage were very great, it would not, therefore, be agreeable to the principle which should dictate the laws of nations, that the freedom of the navigation should be regulated on any other principles than those of mutual agreement.

In regard to those rivers which flow between two countries, the principle of regulation is sufficiently plain. The benefits derivable from the river should be shared equally between them. Its principal benefits arise from the fishing and from the navigation. The right of fishing in most cases may be fitly distributed, by each party fishing from its own bank to the middle of the stream. The right of navigating of each must be so exercised as not to obstruct the right of the other. In this case the same sort of rules are required to prevent the ships of the two nations from obstructing one another in a common river, as are found available to prevent the ships of different individuals from obstructing one another in a river belonging to one country. There is no difficulty, therefore, here, which it is worth stopping to show how to remove.

IV.—*What should be recognised as Rights in time of War. —What should be regarded as necessary to render the Commencement of a War just.—What should be regarded as just and unjust in the Modes of carrying on a War.*

We have now adduced what our limits admit to be said upon the first great branch of the inquiry relative to the law of nations, namely, the rights which they should recognise in one another in the state of peace. We proceed to the second branch, relating wholly to the state of war.

The questions which present themselves for solution relating to the state of war, are either those which respect its commencement, or those which respect the mode of carrying it on.

With respect to the commencement of a war, the principal question is, What are the conditions which should be regarded as necessary to render it just?

As men, in a situation where laws, and the protection derived from them, do not exist, are left to their own protection, and have no means of deterring other men from

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injuring them, but making them dread injury in return; so nations, which, with respect to one another, have, as we have seen before, but little protection from the legal sanction, are left to supply its place by this dread of injury in return, which, in the case both of individuals and of nations, may be called the *retributive sanction*, and of which, in the case of nations, war is the principal organ.

From this view of the essence and end of war, we lay down immediately one pretty extensive proposition with regard to the conditions necessary to render it just.

As the legal sanction, or punishment for the offences of individuals, ought to operate only where some right has been violated, and the violation has been such as to require it, so the retributive sanction of nations, which is war, ought to operate only where some right of the nation, or something which ought to be traced as a right, has been violated, and where the violation has been such as to require that desperate remedy.

But as not all violations which may possibly be committed of the rights of a nation will justify it in inflicting war, the next object is to draw the line of separation, and distinguish between those violations of the rights of nations which justify, and those which do not justify, the extremity of war.

As the evils which war produces are exceedingly great, it is, first of all, evident, that no violation of rights which is not very great, will, upon the principle which we have so often recognised, suffice to justify it. Of two evils, the least is the choice of all sound legislation.

Of the violation of the rights of individuals in the same country, the cases meet for punishment are capable of being pointed out with a degree of accuracy not wanting much of perfection. Of the violation of the rights of nations committed by one nation against another, the cases which would justify the remedial operation of war are much more difficult to define. The difficulty, indeed, is not universal; for there are cases which may be very satisfactorily defined; and as far as definition can go, it is of the utmost importance that it should be carried. Uncertainty, then, pervades only one part of the field; which the more we are able to lessen, the greater is the advantage in favour of humanity. If a proper code of international law were formed, there would be certain defined violations of the rights of nations which would be pointed out, not only as deserving the indignation and hatred of all the world, but as justifying the injured nation before all the world, in inflicting upon its injurer the calamities of war. There would also be certain other injuries pointed out, of a more doubtful character, which might, or might not, according to circumstances not easy to define, be such as to justify recourse to war. The injuries of this secondary character, also, which might, or might not, according to circumstances, justify a war, are capable of being pointed out with a certain degree of accuracy. To a certain degree, likewise, the circumstances which would convert them into justifying causes, are capable of being foreseen. So far definition is capable of extending, and so far, of course, it ought to be carried.

In illustration of this latter class of injuries, we may select the most remarkable, perhaps, and important of all the instances; preparations for a threatened attack. A sense of security is one of the most valuable treasures of a nation; and to be deprived of that sense of security, is one of the greatest injuries. But what state of preparation shall or shall not be considered as justifying the threatened nation in striking the first blow, in order not to give its enemy the advantage of completing his preparations, and making his attack just at the moment when it would be most destructive, it is perhaps impossible to determine for all cases beforehand; though, no doubt, a certain progress may be made towards that determination, and the bounds of uncertainty may be greatly reduced.

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We are aware how general, and therefore how unsatisfactory, these observations are, on the important subject of defining those violations of the rights of nations, which ought to be regarded as justificatory causes of war; but at the same time it is to be observed, that not much more could have been done without framing the code, by actually enumerating and defining the violations for which that remedy should be reserved.

Another consideration is now to be weighed. It is evident, that whatever injuries are done by one nation to another, compensation may almost always be made for them. It is equally evident, that whatever injury may have been sustained, if compensation is made for it, the justificatory cause of war is removed.

The doctrine of compensation, therefore, is an important part of international jurisprudence. Before recourse is had to war for any violation of rights, compensation ought first to be demanded; and no war, except in cases fit for exception, should be regarded as just, which this demand had not preceded; a demand which should be made through a constituted organ, and in a predetermined mode, as we shall more fully describe in a subsequent page, when we come to treat of an international tribunal.

As there can be no reason why the demand of compensation should not always precede the use of arms, except in cases of such a necessity as will not allow time for demanding compensation, a necessity for the immediate use of arms, in order to prevent an evil immediately impending, those cases of urgent necessity should, as far as possible, be sought out and defined.

Other circumstances may be enumerated, as belonging to this first stage of the remedy against a nation which places itself in an attitude affecting the sense of security of any of its neighbours. If a nation is making preparations, or executing any other measures calculated to excite alarm, it may be called upon to desist from them; or it may be called upon to give security that it will not make a hostile use of them. Of these securities, hostages are one of the most familiar instances. Various other instances will easily present themselves to the consideration of our readers. Upon this part of the subject, therefore, it is unnecessary for us to enlarge.

It thus appears, that we may lay down, with a considerable degree of precision, the conditions upon which the commencement of a war ought to be regarded as just. It remains, under this head of inquiry, that we show how it may, as far as possible, be determined, what ought to be regarded as just and unjust in the modes of carrying it on.

This is an inquiry of more complexity, a good deal, than the first. In looking out for a guiding principle, it is evidently necessary to keep in view the end to which every just war is of necessity restricted. That is, compensation for an injury received, and security that a fresh injury shall not be committed. Combining this with the grand principle of humanity and utility, in other words, of morality; namely, that all evil, wilfully occasioned, and not calculated to produce a more than equivalent good, is wicked, and to be opposed, we obtain one comprehensive and highly important rule; which is this: That in the modes of carrying on war, everything should be condemned by the law of nations, which, without being more conducive, or more in any considerable degree to the attainment of the just end of the war, is much more mischievous to the nation against whom it is done.

As the end is to be gained, in most cases, only by inflicting a loss of men and property upon the opposing nation, it would be desirable that the distinction should be drawn between the modes of inflicting this loss, which are the most, and those which are the least, calculated to inflict pain and suffering, without being more conducive to the end.

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One distinction is sufficiently remarkable; namely, the distinction between the men who are in arms, or actually opposed to the designs of the belligerent, and the men who are not so; also between the property which belongs to the government of the opposing nation, and that which belongs to private individuals composing the nation.

With respect to the first class of objects, the men in arms, and the property of the government, there is not much difficulty. To produce the loss of them, as rapidly as possible, till the end or purpose of the war is obtained, appears to be a privilege which cannot be separated from the right of warring at all.

With respect to the loss of men, indeed, there is an important restriction. It means the loss of them for the purposes of the war, and no more. If it be practicable to put them in a situation in which they can no longer be of any service to the war, all farther injury to them should be held unjustifiable. Under this rule falls the obligation so generally recognised of making our enemies, as often as possible, prisoners, instead of killing them, and of treating them with humanity while retained in that condition.

That part of the subject, therefore, which relates to men in arms, and to such property as belongs immediately to the government, it is not impossible to include in rules of tolerable precision. The difficulty is with respect to those individuals who, composing the body of the nation, form no part of the men in arms, and with respect to the property of such individuals.

Though it would not be correct to say, that these do not contribute, or rather that they may not be made to contribute, to the means with which the government carries on the war; yet it would be absurd not to recognise a very broad distinction between them and the men and things which are immediately applied, or applicable to the war. A difference, therefore, equally broad, ought, in reason, to be made in the mode of treating them. The mode of treating the one ought to be very different from that of treating the other. As the rule of destruction must be the rule with regard to the first, only limited by certain restrictions; so the rule of forbearance and preservation ought to be the rule with regard to the latter, only to be infringed upon special and justifying circumstances.

Thus far we seem to have travelled with the advantage of light to our path. We may go a little farther with equal certainty, and say, that, as far as regards the persons of those who are not engaged in the immediate business of hostility, very few occasions can occur, in which it would be allowable, upon any just principle of international law, to do them any injury. Leaving them out of the question, we narrow it to the case of the property belonging to individuals; and shall now proceed to see how far the protection of it can be embraced within general rules.

We must suppose the case which is the strongest, that of an invading army. The advantage which is capable of being derived to such an enemy, by seizing and destroying the property of individuals, bears, unless in certain very extraordinary instances, no sort of proportion to the evil inflicted upon the individuals. This, we presume, cannot admit of a dispute. Upon the principle, therefore, so often recognised, as dictating the rules which ought in this affair to be solely obeyed, no such destruction, unless in such instances, ought to be sanctioned by the law of nations. Such property, it is well known, can rarely be counted upon as any considerable resource; because it is to a very great extent in the power of the people invaded to drive their property away, or to destroy it. The property of individuals in an invaded country would in general be a much more certain resource to an invading army, if that army were to purchase from them the articles it desired. And, perhaps, this would be the most advantageous compromise of which the circumstances admit; namely, that

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the invading army should abstain from the violation of private property, but that it should in return have the benefit of an unrestricted market; that nothing should be done on the part of the government of the invaded country to prevent its subjects from buying and selling with the invaders, as they would with any other parties.

It may no doubt be true, that the plunder and devastation of a province, or other portion of a country, must have an effect in diminishing the resources of the government for carrying on the war. In this point of view, it must be allowed that the destruction of private property is of some importance to the invading nation with regard to the result of the war. But the question, in settling the difficulties of international jurisprudence, is not whether an advantage is gained, but whether the advantage, such as it is, be not gained at too great a cost.

If it be certain that the losing party, in consequence of the destruction in question, loses more than the gaining party gains, it is certain that the two parties, taken together, are losers by the proceeding; and of course that nations, in the aggregate, are losers upon the whole. Nay, it is certain that each nation, taken by itself, is a loser, upon the balance of the cases in which it is liable to lose, and those in which it is liable to gain. If it loses more in the cases in which it bears, than it gains in the cases in which it inflicts invasion, and if it is as liable to bear as to inflict, which is the usual condition of nations, it follows clearly that it is its interest to concur in a rule which shall protect the property of individuals in cases of invasion.

Even in that more civilized mode which has been adopted by invading armies, of availing themselves of the property of individuals, by exacting contributions through the instrumentality of the local authorities; contributions which these authorities are left to partition among the people, as they may deem equitable; though it is admitted that this is a much less hurtful proceeding than military rapine, still we think it will easily appear, that the evil inflicted upon the contributors is greater than the benefits derived to the receivers.

Unless the amount thus received by an invading army is very considerable, the benefit which is derived, the aid which is gained towards accomplishing the end of the war, must be considered as trifling. But if a contribution, the amount of which can be of any considerable avail towards attaining the object of the war, is levied suddenly upon a particular district, a comparatively small portion of the invaded country, it must operate upon the contributors with a dreadful weight of oppression. Upon an equal estimate of the circumstances, it can, therefore, hardly fail to appear that, whether the contribution exacted is heavy or light (it must always be heavy to those who sustain it), the loss to those who suffer must greatly outweigh the advantage to those who receive. If it be so, this mode of exaction should, it is evident, be forbidden by the law of nations.

If these are the principles upon which an international code, regarding this branch of the subject, ought to be constructed, they will enable us to determine the question with regard to the property of individuals in another set of circumstances, to which the rules of civilized society have hardly yet begun to be applied. Whatever rules apply to the property of individuals found upon the land, the same rules ought, by parity of reason, it should seem, to apply to it when found upon the sea.

The conduct of nations, however, has hitherto not been conformable to the parity which appears to belong to the two sets of cases. Some tenderness, more or less, according to the progress of civilization, appears to have been shown, by all but savages, to the property of individuals upon the land. To this hour the property of individuals upon the sea is made prize of without mercy, by the most civilized nations in the world.

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The notions of piracy, in fact, have, on this subject, unhappily prevailed, and governed the minds of men. Pirates make prey of everything. Sailors, originally, were all pirates. The seafaring state was a belligerent state, of almost every vessel against every other vessel. Even when nations had gradually advanced into a more civilized state, and when their vessels abstained from injury to one another in a period of peace, they appear, when the ties of peace were dissolved, and they were placed with respect to one another in a state of war upon the seas, to have felt the force of none but their old associations, and to have looked upon the state of war as a state of piracy. Two nations at war with one another continue to act towards the property of individuals belonging to one another at sea, exactly as two nations of pirates would do.

Assuredly this is a state of things to which the present intelligence and morality of the world ought speedily to put an end. The very same reasoning which we have applied to the case of the property of individuals upon the land, is not less conclusive when applied to the property of individuals upon the sea. The loss to the party losing is more than an equivalent for the gain to the party that gains.

There is another consideration of great importance. All nations gain by the free operations of commerce. If, then, we were to suppose that the losses and gains of the two belligerent parties balanced one another, which yet they never do, there is an advantage derived from their commerce to every nation on the earth to which, in any degree, either directly or indirectly, that commerce extends; which advantage is either lost or diminished, by their preying upon the property of the individuals belonging to one another. This, therefore, is an unquestionable balance of loss to the general community of nations, which the law of that community ought to endeavour to prevent.

If, then, we should suppose that it were enacted as the law of nations, that the property of individuals passing on the seas should be equally respected in peace and in war, we may proceed to consider whether any disadvantage, nearly countervailing the general good, would thence accrue to the belligerents.

It may be alleged, that a nation at war with another is retarded in reducing its antagonist, by the riches which the commerce of that antagonist, if undisturbed, will place at its disposal. But it is evident that an advantage to one of two antagonists, when compensated to the other, by a power to overcome that advantage, exactly equivalent, is in reality no advantage at all. Such is the case with the advantage accruing to the nation with which another is at war, when the property of individuals upon the sea is allowed to pass unmolested. If its riches are increased by freedom of commerce, so are those of its antagonist. The advantages are equal where the circumstances are equal, which, in the majority of cases, they undoubtedly are.

If it be still objected, that there may be cases in which they are not equal, the answer is obvious and incontrovertible. There is no general rule without its exceptions, but partial evil must be admitted for general good. Besides, if the case were very remarkable, it might be excepted from the general rule.

If this were adopted as part of the law of nations, all those questions respecting the maritime traffic of *neutrals*, questions which have been the source of so much troublesome inquiry, so much animosity, and so much mischief, would be immediately at an end. If the traffic of the belligerents, so far as concerned the property of individuals, were free, so would be that of all neutral nations.

Places actually blockaded, that is, surrounded with an hostile force for the immediate purpose of being reduced, either by arms or by famine, would still form exceptions; because the admission of ships into them with

supplies, either of food or munition of war, would be directly at variance with the very object of the blockade.

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In all other cases, the admission either of provisions or of instruments of war into a belligerent country ought, undoubtedly, upon the principle of utility, not to be disturbed. The benefit, except in rare and remarkable cases, could not be material to the country into which they might enter, nor hence the injury to its antagonist; on the other hand, that antagonist would enjoy the same privilege of the free admission of those commodities, and thus they would be equal in all respects. The inconvenience, however, which would thus be saved to the neutrals—the annoyance of search, the loss by detention, the occasions of quarrel—are known to be evils of no ordinary magnitude.

The desertion of sailors from the ships of a belligerent to those of a neutral has given rise to disputes in one instance only, that of Great Britain and the United States of America. The question to be determined, in laying down the principles of international jurisprudence, is, whether this desertion ought to be considered as constituting a ground for the general right of search; in other words, whether the evil to which a belligerent is exposed by desertion, or rather by that portion of desertion which can be prevented by the right of search, is an equivalent for all the evil which is unavoidably produced by it.

Desertion must take place either from the ships of war of the belligerent, or from its merchant ships.

In respect to ships of war, it is so easy for a belligerent to prevent desertion to neutrals, at least in any such degree as to constitute a great evil, that it would be altogether absurd to speak of it as fit to be compared with the evils arising from the right of search. The only occasions on which ships of war can be exposed to desertion to neutrals, must be those on which they go into a neutral port. But on those comparatively rare occasions, they can so easily take precaution against desertion, that the danger to which they are exposed is hardly worth regarding.

When the sailors belonging to merchant ships transfer their services to the ships of a neutral, it is not to be called desertion. It can only take place in very considerable numbers when seamen's wages in the neutral country are much higher than in the belligerent. The sailor, in this case, leaves his own for another country, only because he improves his situation by so doing. This is a liberty which, as it ought to belong to every body, so it ought not to be withheld from the sailor. If, indeed, any nation thinks proper to forbid any class of its people to leave their country, as England with regard to its artificers, other countries cannot help that; but they ought not to be called upon to lend their aid to such an antisocial regulation, by allowing their vessels to be searched, as security against its infringement. Besides, it is evident that there is a much greater security, arising from the very nature of the case, against the chance of a nation's being, to any considerable degree, deprived of its sailors by any such means. If the sailors go into the neutral country because wages are higher there, a small number only will have gone, when wages, from diminution of the numbers, will begin to rise in the country which they have left, and, from increase of the numbers, will begin to fall in the country to which they have been tempted to repair. When the wages of seamen have thus sufficiently risen in the belligerent country, which they are sure to do if the demand for them rises, the sailors will not only come back from every country in the world, but the sailors of other countries will hurry along with them; and the evil of desertion cures itself.

Only two questions of any great importance appear to remain; that relating to the march of troops, for a hostile purpose, through a neutral country, and that relating to

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the extent to which the operations of a successful war ought to be pursued.

According to the principles which we have already laid down for regulating the proceedings of a hostile army even in the invaded country, namely, that of committing no plunder, and enjoying the right of market, it appears that the right of passing through a neutral country on similar terms should be refused to no party. This rule, while it holds out equal advantages to all belligerents, admits, less than any other rule, grounds of dispute.

The end, which we have already described as that alone the pursuit of which can render any war justifiable, sufficiently defines the extent to which the operations of a successful war ought to proceed. The end of every justifiable war is to obtain compensation for an injury sustained, and security against the repetition of it. The last point, that of security, alone admits any uncertainty. Nations are apt to exaggerate the demand for security; to require too much; very often unconsciously, from the mere cravings of self-love; sometimes fraudulently, as a cover for ambitious views. As the question, however, respecting what may or may not, in each instance, be sufficient security, is a question of fact, not of law, it must be determined, if determined at all, by a tribunal empowered to take cognizance of the facts.

V.—*Of the Construction of an International Code, and an International Tribunal.—How the Nations might concur in framing an International Code.—How an International Tribunal should be constructed.—Form of Procedure before the International Tribunal.*

We have now, then, laid down the principles by which, in our opinion, the rights of nations, in respect to one another, ought to be determined; and we have shown in what manner those principles should be applied, in order to come to a decision in the most remarkable cases. The minor points it is, of course, not in our power to illustrate in detail; but that will not, we should hope, be difficult, after the exemplification exhibited, and the satisfactory solutions at which we seem to have arrived, of all the more considerable questions which the subject presents.

From what has been shown, it is not difficult to see what would be the course pursued by nations, if they were really actuated by the desire of regulating their general intercourse, both in peace and war, on the principles most advantageous to them all.

Two grand practical measures are obviously not only of primary importance toward the attainment of this end, but are of indispensable necessity toward the attainment of it in any tolerable degree. These are, first, the construction of a code; and, secondly, the establishment of a tribunal.

It is perfectly evident, that nations will be much more likely to conform to the principles of intercourse which are best for all, if they have an accurate set of rules to go by, than if they have not. In the first place, there is less room for mistake; in the next, there is less room for plausible pretexts; and, last of all, the approbation and disapprobation of the world is sure to act with tenfold concentration, where a precise rule is broken, familiar to all the civilized world, and venerated by all.

How the nations of the civilized world might concur in the framing of such a code, it is not difficult to devise. They might appoint delegates to meet for that purpose in any central and convenient place, where, after discussion, and coming to as full an undertaking as possible upon all the material points, they might elect some one person, the most capable that could be found, to put these their determinations into the proper words and form; in short, to make a draught of a code of international law, as effectually as possible providing for all the questions

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which could arise, upon their interfering interests, between two nations. After this draught was proposed, it should be revised by the delegates, and approved by them, or altered till they deemed it worthy of their approbation. It should then be referred to the several governments, to receive its final sanction from their approbation; but, in the mean time, it should be published in all the principal languages, and circulated as extensively as possible, for the sake of two important advantages. The first would be, that, the intelligence of the whole world being brought to operate upon it, and suggestions obtained from every quarter, it might be made as perfect as possible. The second would be, that the eyes of all the world being fixed upon the decision of every nation with respect to the code, every nation might be deterred by shame from objecting to any important article in it.

As the sanction of general opinion is that upon which chiefly, as we have already seen, such a code must rely for its efficiency, not a little will depend upon the mode in which it is recognised and taught. The recognition should in each country have all possible publicity and solemnity. Every circumstance which can tend to diffuse the opinion throughout the earth, that the people of each country attach the highest importance to such a code, is to themselves a first-rate advantage; because it must be of the utmost importance to them, that all the nations of the earth should behave towards them upon the principles of mutual beneficence; and nothing which they can do can have so great a tendency to produce this desirable effect, as its being generally known that they venerate the rules which are established for its attainment.

If nations, then, were really actuated by the desire of regulating their mutual intercourse upon principles mutually beneficent, they would adopt measures for having a code of international law constructed, solemnly recognised, and universally diffused and made known.

But it is not enough that a code should exist: every thing should be done to secure a conduct conformable to it. Nothing is of so much importance for this purpose as a tribunal; before which every case of infringement should be tried, the facts of it fully and completely explored, the nature and degree of the infringement ascertained; and from which a knowledge of every thing material to the case should be as rapidly as possible diffused through the world; before which also all cases of doubt should regularly come for determination: and thus wars, between nations which meant justly, would always be avoided, and a stigma would be set upon those which justice could not content.

The analogy of the code, which is, or ought to be, framed by each state for regulating the intercourse of its own people within its own territory, throws all the illustration which is necessary upon the case of a tribunal for the international code. It is well known, that laws, however carefully and accurately constructed, would be of little avail in any country, if there was not some organ, by means of which it might be determined when individuals had acted in conformity with them, and when they had not; by which also, when any doubt existed respecting the conduct which in any particular case the law required, such doubt might be authoritatively removed, and one determinate line of action prescribed. Without this, it is sufficiently evident that a small portion of the benefit capable of being derived from laws would actually be attained. It will presently be seen how much of the benefit capable of being derived from an international code must be lost, if it is left destitute of a similar organ. We shall first consider in what manner an international tribunal might be constructed; and, next, in what manner it might be appointed to act.

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As it is understood that questions relating to all nations should come before it, what is desirable is, that all nations should have equal security for good judicature from it, and should look with equal confidence to its decisions.

An obvious expedient for this purpose is, that all nations should contribute equally to its formation; that each, for example, should send to it a delegate or judge. Its situation should be chosen for its accessibility, and for the means of publicity which it might afford; the last being, beyond comparison, the advantage of greatest importance. As all nations could not easily, or would not, send, it would suffice if the more civilized and leading nations of the world concurred in the design, with such a number of the less considerable as would be sure to follow their example, and would be desirous of deriving advantage from an instrument of protection, which to them would be of peculiar importance.

As it is found by specific experience, and is, indeed, a consequence of the ascertained laws of human nature, that a numerous assembly of men cannot form a good judicatory; and that the best chance for good judicial service is always obtained when only one man judges, under the vigilant eyes of interested and intelligent observers, having full freedom to deliver to the world their sentiments respecting his conduct; the whole of these advantages may be obtained, in this case, by a very effectual expedient. If precedent, also, be wanted, a thing which in certain minds holds the place of reason, it is amply furnished by the Roman law; according to which, a great number of judges having been chosen for the judicial business generally of the year, a selection was made out of that number, according to certain rules, for each particular case.

Every possible advantage, it appears, would be combined in the international tribunal, if the whole body of delegates or judges, assembled from every country, should, as often as any case for decision came before them, hold a conference, and, after mature deliberation, choose some one individual of their body, upon whom the whole duty of judge should, in that case, devolve; it being the strict duty of the rest to be present during the whole of his proceedings, and each of them to record separately his opinion upon the case, after the decision of the acting judge had been pronounced.

It would be, no doubt, a good general rule, though one can easily foresee cases in which it would be expedient to admit exceptions, that the judge, who is in this manner chosen for each instance of the judicial service, should not be the delegate from any of the countries immediately involved in the dispute. The motive to this is sufficiently apparent.

We apprehend, that few words will be deemed necessary to show how many securities are thus provided for the excellence of the judicial service.

In the first place, it seems impossible to question, that the utmost fairness and impartiality are provided for in the choice of the judge; because, of the two parties involved in the dispute, the one is represented by a delegate as much as the other, and the rest of the delegates are indifferent between them. In general, therefore, it is evident, that the sinister interest on the two sides being balanced, and there being a great preponderance of interest in favour of nothing but a just decision, that interest will prevail.

The best choice being made of a judge, it is evident that he would be so situated as to act under the strongest securities for good conduct. Acting singly, he would bear the whole responsibility of the service required at his hands. He would act under the eyes of the rest of the assembled delegates, men versed in the same species of business, chosen on account of their capacity for the service, who could be deceived neither with respect to the

diligence which he might exert, nor the fairness and honesty with which he might decide; while he would be watched by the delegates of the respective parties, having the power of interest stimulating them to attention; and would be sure that the merits or demerits of his conduct would be made fully known to the whole, or the greater part of the world.

The judicatory being thus constituted, the mode of proceeding before it may be easily sketched.

The cases may be divided into those brought before it by the parties concerned in the dispute, and those which it would be its duty to take up when they were not brought before it by any of the parties.

A variety of cases would occur, in which two nations, having a ground of dispute, and being unable to agree, would unite in an application to the international tribunal for an adjustment of their differences. On such occasions, the course of the tribunal would be sufficiently clear. The parties would plead the grounds of their several claims; the judge would determine how far, according to the law, they were competent to support those claims; the parties would adduce their evidence for and against the facts on which the determination of the claims was found to depend; the judge would receive that evidence, and finally decide. All this is so perfectly conformable to the course of pleading, and receiving proof, in the case of suits between individuals, as analysed and explained in the preceding article, that it is unnecessary to be more particular here. If further exposition is required, it will be found upon a reference to the article to which we allude. Decision, in this case, it is observable, fully accomplishes its end; because the parties come with an intention of obeying it.

Another, and a numerous class of cases, would probably be constituted, by those who would come before it, complaining of a violation of their rights by another nation, and calling for redress.

This set of cases is analogous to that, in private judicature, when one man prosecutes another for some punishable offence.

It should be incumbent upon the party thus applying to give notice of its intention to the party against which it is to complain, and of the day on which it means that its complaint should be presented.

If both parties are present when the case comes forward for trial, they both plead, according to the mode described in the preceding article; evidence is taken upon the decisive facts; and if injury has been committed, the amount of compensation is decreed. When it happens that the defendant is not present, and refuses to plead, or to submit, in this instance, to the jurisdiction of the court, the inquiry should notwithstanding go on; the allegations of the party present should be heard, and the evidence which it adduces should be received. The non-appearance of the party defendant should be treated as an article of evidence to prove the truth of its opponent's allegations. And the fact of not appearing should itself be treated as an offence against the law of nations.

It happens, not unfrequently, when nations quarrel, that both parties are in the wrong; and on some of these occasions neither party might think proper to apply to an equitable tribunal. This fact, namely, that of their not applying to the international tribunal, should itself, as stated before, be marked in the code as an international offence, and should be denounced as such by the international tribunal. But even when two offending parties do not ask for a decision from the international tribunal, it is not proper that other nations should be deprived of the benefit of such a decision. If these decisions constitute a security against injustice from one another to the general community of nations, that security must not be al-

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lowed to be impaired by the refractory conduct of those who dread an investigation of their conduct.

Certain forms, not difficult to devise, should be laid down, according to which, on the occurrence of such cases, the tribunal should proceed. First of all, it is evident that the parties in question should receive intimation of the intention of the court to take cognizance of their disputes on a certain day. If the parties, one or both, appeared, the case would fall under one of those which have been previously as above considered. If neither party appeared, the court would proceed to estimate the facts which were within its cognizance.

It would have before it one important article of evidence, furnished by the parties themselves, namely, the fact of their non-appearance. This ought to be considered as going far to prove injurious conduct on both sides. The evidence which the court would have before it, to many specific facts, would be liable to be scanty, from the neglect of the parties to adduce their pleas and evidence. The business of the court, in these circumstances, would be, to state correctly such evidence, direct or circumstantial, as it had before it; giving its full weight to the evidence contained in the fact of non-appearance; and to pronounce the decision which the balance of the evidence, such as it was, might be found to support.

Even in this case, in which the practical effect of a decision of the international court may be supposed to be the least, where neither party is disposed to respect the jurisdiction, the benefit which would be derived would by no means be inconsiderable. A decision solemnly pronounced by such a tribunal would always have a strong effect upon the imaginations of men. It would fix and concentrate the disapprobation of mankind.

Such a tribunal would operate as a great school of political morality. By sifting the circumstances in all the disputes of nations, by distinguishing accurately between the false colours and the true, by stripping off all disguises, by getting at the real facts, and exhibiting them in the true point of view, by presenting all this to the world, and fixing the attention of mankind upon it by all the celebrity of its elevated situation, it would teach men at large to distinguish. By habit of contemplating the approbation of such a court attached to just proceeding, its disapprobation to unjust, men would learn to apply correctly their own approbation and disapprobation; whence would flow the various important effects which those sentiments, justly excited, would naturally and unavoidably produce.

As, for the reasons adduced at the beginning of this article, the intention should never be entertained of supporting the decisions of the international court by force of arms, it remains to be considered what means of another kind could be had recourse to in order to raise to as high a pitch as possible the motive of nations respectively to yield obedience to its decisions.

We have already spoken of the effect which would be produced, in pointing the sentiments of mankind, and giving strength to the moral sanction, by the existence of an accurate code, and the decisions themselves of a well-constituted tribunal.

To increase this effect to the utmost, publicity should be carried to the highest practicable perfection. The code, of course, ought to be universally promulgated and known. Not only that, but the best means should be in full operation for diffusing a knowledge of the proceedings of the tribunal; a knowledge of the cases investigated, the allegations made, the evidence adduced, the sentence pronounced, and the reasons upon which it is grounded.

The book of the law of nations, and selections from the book of the trials before the international tribunal, should form a subject of study in every school, and a knowledge

of them a necessary part of every man's education. In this manner a moral sentiment would grow up, which would, in time, act as a powerful restraining force upon the injustice of nations, and give a wonderful efficacy to the international jurisdiction. No nation would like to be the object of the contempt and hatred of all other nations; to be spoken of by them on all occasions with disgust and indignation. On the other hand, there is no nation which does not value highly the favourable sentiments of other nations; which is not elevated and delighted with the knowledge that its justice, generosity, and magnanimity, are the theme of general applause. When means are taken to make it certain, that what affords a nation this high satisfaction will follow a just and beneficial course of conduct, that what it regards with so much aversion will infallibly happen to it if it fails in the propriety of its own behaviour, we may be sure that a strong security is gained for a good intercourse among nations.

Besides this, it does not seem impossible to find various inconveniences, to which, by way of penalties, those nations might be subjected, which refused to conform to the prescriptions of the international code.

Various privileges granted to other nations, in their intercourse with one another, might be withheld from that nation which thus demeaned itself in a way so contrary to the general interests. In so far as the withholding of these privileges might operate unfavourably upon individuals belonging to the refractory nations, individuals who might be little, or not at all, accessory to the guilt, the effect would be the subject of proportional regret. Many, however, in the concerns of mankind, are the good things which can only be attained with a certain accompaniment of evil. The rule of wisdom, in such cases, is, to make sure that the good outweighs the evil, and to reduce the evil to its narrowest dimensions.

We may take an instance first from trivial matters. The ceremonial of other nations might be turned against the nation, which, in this common concern, set itself in opposition to the interests of others. The lowest place in company, the least respectful situation on all occasions of ceremony, might be assigned to the members of that nation, when travelling or residing in other countries. Many of those marks of disrespect, implying injury neither to person nor property, which are checked by penalties in respect to others, might be free from penalties in respect to them. From these instances, adduced merely to illustrate our meaning, it will be easy to see in what manner a number of considerable inconveniences might, from this source, be made to bear upon nations refusing to conform to the beneficial provisions of the international code.

Besides the ceremonial of other nations, means to the same end might be derived from the law. A number of cases might be found in which certain benefits of the law, granted to other foreigners, might be refused to them. They might be denied the privilege of suing in the courts, for example, on account of any thing except some of the higher crimes, the more serious violations of person or property.

Among other things, it is sufficiently evident that this tribunal would be the proper organ for the trial of piracy. When preponderant inconvenience might attend the removing of the trial to the usual seat of the tribunal, it might delegate for that purpose the proper functionaries to the proper spot.

By the application of the principles which we have thus expounded, an application which implies no peculiar difficulty, and requires nothing more than care in the detail, we are satisfied that all might be done, which is capable of being done, toward securing the benefits of international law.

(J. M.—L.)

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Law, John.

LAW, JOHN, commonly known by the name of the Projector, was the eldest son of William Law, and was born at Edinburgh in the month of April 1671. His father followed the profession of goldsmith or banker, with so much success, that he was enabled to purchase the lands of Lauriston and Randleston, which afterwards descended to his son. The latter was educated at Edinburgh, where he is said to have made some progress in literature; but the bent of his genius having led him to study arithmetic and geometry, he attained such proficiency in these branches as to be able to solve with facility the most intricate problems; and he likewise made himself master of algebra. The principles of public and private credit, the state of trade and of manufactures, the theory and practice of taxation, and other matters connected with political economy, also engaged his attention; and the accession of knowledge resulting from these inquiries laid the foundation of his future eminence. But he soon became noted as a man of pleasure as well as of study. Having lost his father before he had completed his fourteenth year, he was thus left at an early age without paternal control; and as the graces of a naturally handsome person were improved by the acquisition of external accomplishments, Jessamy John, or Beau Law, as he was indifferently called by his companions, addicted himself to the practice of all games of chance, skill, and dexterity, and appears to have engaged in other pursuits of a still more questionable character. In 1694 he visited London, where his wit and accomplishments procured him admission into the first circles, whilst his extravagance speedily involved him in difficulties. At this time he was noted for his propensity to deep play, and for his gallantries amongst women. By the former, he injured his fortune; in consequence of the latter, he narrowly escaped an ignominious end. An intrigue which he had with a Mrs Lawrence proved the occasion of a quarrel between him and one Mr Edward Wilson; a hostile meeting ensued, and Mr Law killed his antagonist on the spot. He was immediately apprehended, and brought to trial at the Old Bailey, on a charge of murder; and being found guilty, received sentence of death. Upon a representation of the case to the crown, however, Law obtained a pardon; but an appeal being lodged by a brother of the deceased, he was detained in the King's Bench Prison. This appeal was brought before the Court of King's Bench in Trinity-term 1694: and as the exceptions taken on the part of Law were overruled by the court, the latter, judging it not prudent to await the result, found means to escape from prison,¹ and retired to the Continent.

Law resided for several years abroad, first at Paris, where he acquired great dexterity in all games of chance, and afterwards at Genoa and Venice. One cause assigned for his leaving Paris, was his eloping with Lady Catherine, third daughter of Nicholas, Lord Banbury, and wife of Mr Senor, or Seinour. His success in play was so great, that he is said to have acquired L.20,000. At Venice his attention was first directed to the subject of paper-money and banking; but failing in his application, during the reign of William III., to return to England, he proceeded to Amsterdam, and made himself practically acquainted with the Dutch system of banking. An anonymous work, by William Paterson, entitled, *Proposals and Reasons for Constituting a Council of Trade*, printed at Edinburgh in 1701, at an interval of fifty years, was republished at Glasgow, and the name of Law given as its author, without any authority.

Being dated from Edinburgh, 31st December 1700, Law's Law, John, biographers have concluded that he must have then returned to Scotland; but the work was unquestionably written by Paterson, known as the founder of the Bank of England, and of the Darien Scheme. Five years later, however, Law, having secured the interest of several persons of distinction, offered to the Scottish parliament, in 1705, a plan for removing the difficulties under which the kingdom then laboured from the scarcity of specie, and the stoppage of payments by the bank; and, with a view to further his object, he published a work, entitled, *Money and Trade considered, with a Proposal for supplying the Nation with Money*, which appeared at Edinburgh the same year. His "proposal" was, that commissioners, to be appointed by an act, under the control of parliament, should be empowered to issue notes, either in the way of loan, at ordinary interest, or upon landed security; the debt, however, not to exceed half, or at the most, two-thirds, of the value of the land; or upon land-pledges, redeemable within a certain period, to the full value of the land; or, lastly, upon sale irredeemably to the amount of the price agreed upon. Paper-money, thus issued and secured, would, he conceived, be equal in value to gold and silver money of the same denomination, and might even be preferred to these metals, as not being, like them, liable to fall in value. But this scheme, though supported by the united weight of the court party, and of that called the *squadron*, headed by the Duke of Argyll and the Marquis of Tweeddale, was rejected, as the parliament on the 27th of July 1705 resolved, "that the forcing any paper credit by an Act of Parliament was unfit for this nation;" and, likewise, that "it was an unfit expedient for this nation, that the current specie within the kingdom should be raised above for what it passes at present." The rejection of the plan was occasioned by an apprehension, that if it were adopted all the estates of the kingdom would thereby be brought to a complete dependence upon the government. He also failed in a final application to Queen Anne for a pardon of the sentence given against him for Wilson's murder in 1694, which precluded his return to England.

Mr Law therefore resolved to abandon his native country, and to try his fortune abroad. He resided some time at Brussels, where he became noted for extraordinary success at play; and in two excursions which he made to Paris, his good fortune at the gaming-table became still more conspicuous. Having visited the principal cities of Italy, he continued the same career, playing at all sorts of games, and betting and speculating in the public funds and banks, with uninterrupted success; insomuch that, in the year 1714, he was worth upwards of L.110,000 sterling. During these rambles, Law, having the advantage of a graceful figure and an insinuating address, was everywhere well received by persons of the highest quality. At Florence he became acquainted with the Duke de Vendôme, whom he had the honour to oblige with the loan of a considerable sum of money. At Neuchâtel he obtained access to the Prince of Conti, to whom he imparted some of his financial projects. During a short residence at Turin, he communicated to Victor Amadeus, King of Sardinia, a scheme for aggrandizing his territories, of the same nature as that which he afterwards proposed to the Duke of Orleans; but the prudent monarch declined embarking in so perilous an adventure, observing to the projector, that his dominions were too small for the execution of so great a design, and that

¹ In the *London Gazette* of Monday, 7th January 1695, a reward of fifty pounds was offered for the apprehension of "Captain John Law, a Scotchman, lately a prisoner in the King's Bench for murder," who is described as "a very tall, black, lean man, well shaped, above six foot high, large pock-holes in his face, big high nosed, speaks broad and loud." This description, which conveys no very favourable idea of Law's personal appearance, and differs from his real portrait, is supposed by Mr Wood to have been drawn up with a view to facilitate his escape. The prefix of "Captain," which is otherwise a good travelling title, may also, perhaps, be explained on the same hypothesis.

Law, John. France was the proper theatre for such speculations. "If I know the disposition of the people of that country," added Victor Amadeus, "I am sure they will relish your schemes; and, therefore, I would advise you to go thither without delay."

Law took the advice which was thus given him, and returned to Paris, where he arrived in 1714, not long before the death of Louis XIV. He was more favourably received than on the occasion of his former visits, when he appears to have been regarded as a mere adventurer; and soon gained the confidence of the Duke of Orleans to such a degree, that he was not only admitted to the convivial parties of the regent, but even nominated one of his counsellors of state. At this time the French finances were in the greatest disorder, indeed in a situation accounted desperate; the nation was burthened with an immense load of debt, contracted during the expensive wars of Louis XIV.; and the people groaned under the intolerable pressure of the taxes which had been imposed for payment of the interest. All industry was thus checked, and trade in a manner annihilated; manufactures, commerce, and navigation, had almost ceased; the merchant and the trader were reduced to beggary, and the artificer was compelled, for want of employment, to leave the kingdom. In a word, the state of affairs was such, that it had been debated in council, and actually proposed to apply a sponge to the debt, and to seek relief by means of a national bankruptcy. The proposal, however, was rejected by the regent, and a commission appointed to inquire into the claims of the state creditors, and endeavour to introduce some degree of order into the public finances. At this calamitous crisis, when the surplus of the public revenue, after payment of the interest of the debt, was found insufficient to defray the necessary expenses of the civil government, Law came forward with his favourite nostrum or panacea, and proposed to liquidate the debt, by establishing a bank for issuing notes secured upon landed property, and on the unalienable impledgement of all the royal revenues. The project seems to have been approved of, but as the conjuncture was thought unfavourable for risking so bold an experiment, his application proved ineffectual. Nothing discouraged, Law requested and obtained permission to establish a private bank, to consist entirely of funds advanced by himself, and others who chose to embark in the undertaking. The letters-patent, which are dated the 2d and 20th of May 1716, specify the principles upon which the bank had been established, as well as the regulations according to which it was to be conducted. The scheme promised success, and, in fact, the General Bank of Law and Company had acquired great credit, when, in December 1718, it was dissolved by an *arrêt* of the regent, who, observing the advantages resulting from the establishment, resolved to take it into the hands of government; a resolution which could not be very agreeable to the founder and his associates in the enterprise. Law, however, was named director-general of the Royal Bank, in which his own had merged; and branches were established at Lyons, Rochelle, Tours, Orleans, and Amiens.

Law now began to develop the stupendous project he had long meditated, and which afterwards became so well known to all Europe, under the name of the Mississippi System. This scheme was nothing less than the vesting of the whole privileges, effects, and possessions of all the foreign trading companies, the great farms, the mint, the general receipt of the king's revenues, and the management and property of the bank, in one great company, who, having thus in their hands all the trade, taxes, and royal revenues, might be enabled to multiply the notes of the bank to any extent they pleased, doubling or even tripling at will the circulating medium of the kingdom, and, by the immensity of their funds, possessed of a power to carry the foreign trade and the improvement of the colonies to a

height altogether unattainable by other means. This monstrous and impracticable monopoly was approved of by the regent, and by letters-patent a commercial company was established, under the name of the Company of the West; to which was at the same time granted the whole province of Louisiana, a country watered throughout its whole extent by the Mississippi, from which the project accordingly took its name. The scheme was well calculated to entrap the unwary and to seduce the speculative. Of this company 200,000 actions or shares were issued, at 500 livres each, and the subscriptions were made payable in a depreciated paper-currency, called *billets d'état*, which, however, in the subscriptions, was taken at its full value. This could not fail to operate as a tempting bait to the holders of these billets or notes to lay them out in the purchase of shares, especially since the depreciation amounted to between sixty and seventy per cent. The company thus became creditors of the king to the extent of a hundred millions of livres, the interest of which sum was fixed at the rate of four per cent.

Law, who had now advanced high in the regent's favour, was of course named director-general of the Company of the West, and thus intrusted with the development of his own stupendous project. Louisiana having been represented as a region abounding in gold and silver, and possessing a fertile soil capable of the highest cultivation, the actions or shares were bought up with the greatest avidity; and such was the rage for speculation, that the unimproved parts of the colony were actually sold for 30,000 livres the square league. In pursuance of the scheme, the farm of tobacco was made over to the company at an advance of rent exceeding two millions of livres. Soon afterwards they acquired the charter and effects of the Senegal Company; and this was succeeded by a still more important acquisition, namely, the exclusive privilege of trading to the East Indies, China, and the South Seas, together with all the possessions and effects of the China and India companies, now dissolved, upon the condition of liquidating all just claims against them. Upon this occasion, the Company of the West assumed the title of Company of the Indies; and 50,000 new shares were ordered to be constituted, at 550 livres each, payable in coin. The price of actions quickly rose to 1000 livres each. On the 25th of July 1719, the mint was made over to this company for a consideration of fifty millions of livres, to be paid to the king within fifteen months; on the 27th of August following, the regent took out of the hands of the farmers-general, and made over to them, the great farms, for which they agreed to pay an advance of rent of three millions and a half of livres; and, on the 31st of the same month, they also obtained the general receipt or collection of the other branches of the king's revenue. Having acquired all these grants, and thus concentrated in themselves not only the whole foreign trade and possessions of France, but also the collection and management of the royal revenues, they promised an annual dividend of 200 livres on every share; the price of actions instantly rose in the market to 5000 livres; and the public ran with such eagerness upon the last creation of stock, that nearly double the requisite sum was subscribed, whilst the greatest interest was exerted, and every stratum put in practice, to secure places in that subscription. The frenzy now became general. A rage for the acquisition of shares in the India Company seized and infatuated all ranks in the kingdom. Clergy and laity, peers and plebeians, princes and peasants, statesmen and magistrates, nay, even ladies, all, in short, who either had or could procure money for the purpose, turned stockjobbers, outbidding each other with such avidity, that, in November 1719, the price of shares rose to above 10,000 livres, or (when the depreciation of the *billets d'état* is taken into account) more than sixty times the sum they originally sold for. Nothing was talked of but actions; every place echoed with Missis-

Law, John. sippi and Quinquempoix.¹ All classes appeared to have but one object, one pursuit. Mechanics laid aside their work, tradesmen forsook their shops, and persons of all grades neglected their professions or employments, to embark in this new occupation; whilst even the few who observed some degree of moderation, showed by their conduct how little concern they took in affairs foreign to the Mississippi scheme.² The delirium had reached its culminating point.

Mr Law now blazed a meteor of unequalled splendour. He possessed the ear of the Duke of Orleans; he was almost adored by the people, ever ready to worship at the shrine of the idol of the hour; and he was surrounded by princes, dukes, peers, marshals, and prelates, who all courted his friendship, and even seemed ambitious of his patronage. Nobles were content to wait in his ante-chambers, like the meanest subjects; and ladies of the highest quality employed every artifice, sometimes at the risk of their necks, to attract his passing notice.³ The property which he acquired was immense. He purchased no less than fourteen estates with titles annexed to them, and amongst these the marquisate of Rosny, which had belonged to the illustrious Sully, the friend and minister of Henri IV. About this period, too, a free pardon for the murder of Mr Wilson was conveyed to him from England; and Edinburgh, proud of having produced so great a personage, transmitted to him the freedom of the city in a gold box. By his abjuration of the Protestant religion, the only obstacle which stood in the way of his advancement to the highest offices in the state was soon afterwards removed; and, on the 5th of January 1720, he was appointed comptroller-general of the finances. A few days previous to this, the Academy of Sciences had elected him one of its honorary members; and the flattering incense of poetry was offered up at the same shrine with the homage of an infatuated people. Thus the astonished world beheld an obscure foreigner, of doubtful reputation and questionable character, rise in a few months from a private condition to the high station of prime minister of France, and govern for a time, with almost absolute power, one of the greatest and most enlightened nations of Europe. It might well be said of him, *Tollitur in altum ut casu graviore cadat*.

But after having raised himself to such an unexampled eminence, Law at length fell a sacrifice to the intrigues of the other ministers, who, partly from envy, and partly from apprehension, combined with ignorance, undermined the insecure fabric he had reared, and thus precipitated its fall. The credit of the bank and of the India Company had attained its height in November 1719, when shares of the latter sold for more than 10,000 livres each, and money was so abundant in the former that the directors agreed to lend any sum upon proper security at two per cent. But amidst the general delirium, there were symptoms which evidently betokened an approaching revulsion. The most alarming of these was a constant drain of specie from the bank, either for the purpose of being hoarded or sent

abroad. Astonished at their exorbitant gains, the original proprietors of the company thought only of converting their shares into gold, and realizing the fortunes which they had so suddenly acquired; and it was computed that not less than 500 millions of livres, the property of persons of this description, had been sent out of France. To avert the danger which thus threatened the system, several edicts were issued early in 1720, by which payments in specie were restricted to small sums, and the standard of the coin was kept in continual fluctuation, whilst bank-notes were declared to remain invariable, and rents, taxes, and customs were made payable in notes. But what crowned all was the edict of the 27th February 1720, prohibiting individuals, as well as secular or religious communities, from having in their possession more than 500 livres in specie, under the penalty of a fine, and confiscation of all sums found exceeding that amount; a measure which could scarcely fail to sow distrust in the bosom of families, and to excite alarm in the public mind. Still the delusion prevailed. On the 23d of February, a few days before the publication of this edict, the Royal Bank had been incorporated with the company, and the king not only remained guarantee of the bank-notes, but gave up to the company all the profits made by the bank since December 1718, when the government had taken it into its own hands. Meanwhile, the manufacture of notes proceeded with so much activity, that, by the 1st of May 1720, paper-money had been fabricated to the amount of more than 2600 millions of livres, or nearly L.110,000,000 sterling; whilst the specie in the kingdom was estimated at only 1300 millions of livres, or about L.52,000,000 sterling. In this state of matters, Cardinal Dubois and M. D'Argenson represented to the regent that it had become necessary to equalize the proportion between the notes and the coin, either by reducing the value of the one to the extent of a half, or by doubling that of the other.

This extraordinary point was debated in council, where it was opposed by some of the members, amongst whom was the comptroller-general, who strenuously contended for letting matters remain as they were; but the majority being in favour of the proposition for lowering the value of the paper, it was decided accordingly; and, on the 21st of May 1720, an edict was issued, which, contrary to all sound policy, and even to the most solemn stipulations, reduced the value of the company's bank-notes one-half, and fixed their actions or shares at 5000 livres. By this unjustifiable and fatal step, the whole paper fabric was destroyed in an instant, the notes lost all credit, and next day a man might have starved with 100 millions of paper money in his pocket. The consternation with which all ranks were seized was soon converted into rage, and it became necessary to station troops in different parts of the capital, to prevent the consequences to be apprehended from the fury and despair of the populace. Disorder and confusion reigned everywhere; seditious and inflammatory libels were posted up and distributed; and the life of the regent himself was

¹ The street where the stockjobbing was at first carried on.

² The unexampled rise in the price of actions enabled obscure and humble individuals to acquire at once princely fortunes; and many amusing anecdotes are told of persons thus suddenly raised to affluence. A footman having realized a large sum, provided himself with a carriage; but the first day it drew up at his door, obeying the instinctive habit of his calling, he, instead of stepping into the vehicle, mounted up to his old station behind it. Another of the same fraternity, who had obeyed the like familiar impulse, endeavoured adroitly to cover his mistake by pretending that he got up merely to see if there was room at the back for two or three more lacqueys, whom he was resolved to hire instantly. Law's coachman had made so great a fortune that he asked a dismissal from the service of his master, which was granted, on condition of his procuring another as good as himself. Cook-maids and waiting-women appeared at the opera, bedizened with jewels and finery; many who had not a dozen livres in the world suddenly "tumbled from a garret into a carriage;" and the son of a baker at Toulouse, being desirous of having a superb service of plate, purchased the contents of a goldsmith's shop for 400,000 livres, and sent them home to his wife, with orders to set them out properly for supper. In a word, property underwent a new and most grotesque distribution.

³ The regent's mother asserts, in one of her letters, that "si Laws le vouloit, les femmes Françaises lui baiseroient la derrière;" a strong expression, certainly, but one which shows that all ideas of delicacy, or even decency, were absorbed by the cupidity and avarice which had taken possession of the public mind.

Law, John. threatened.¹ Some conception may be formed of the distress of the people, when it is considered that at the time when the bank thus stopped payment, and the value of paper money instantly sunk to zero, not less than 2,235,085,590 livres, or upwards of L.90,000,000 sterling in notes, were in circulation. Law was, of course, peculiarly obnoxious to popular odium, which he endeavoured in vain to allay by resigning into the hands of the regent his office of comptroller-general, on the 29th of May; but, though several times exposed to imminent danger, from the vengeance both of the parliament and the people, he remained in France until towards the close of the year 1720, when he withdrew to Brussels; and soon afterwards his whole property was confiscated, and his brother William sent to the Bastille.

Law arrived at Brussels on the 22d of December 1720, and, after waiting there for some time, in the vain expectation of being recalled to France, set out for Venice, which he reached early in January 1721; he then visited other places on the Continent, and, in October, arrived in England, for the ostensible purpose of pleading the king's pardon. He was at first well received, and visited by persons of distinction; but when it was discovered that the fallen financier was in a state almost bordering upon destitution, his friends began to fall off, and, of those who had known or perhaps courted him in his day of power, he could find none good-natured enough to lend him a thousand pounds. In a letter addressed to Mrs Howard, afterwards Countess of Suffolk, he calls that lady his "only friend;" an avowal which affords a striking instance of the instability of fortune, power, and friendship. After residing some years in England, this extraordinary man returned once more to the Continent, and closed his chequered career at Venice, where, on the 21st of March 1729, he died in a state but little removed from indigence, in the fifty-eighth year of his age. Lady Catherine Knollys, with whom Law had eloped, as formerly mentioned, but whom he subsequently married, survived him several years, having died in 1747. Soon after his death appeared the following epitaph, the point of which reminds us of the bitter jests which appeared upon the occasion of his fall:—

Ci git cet Ecossois célèbre,
Ce calculateur sans égal,
Qui, par les règles de l'algèbre,
A mis la France à l'hôpital.

Even if it had not been interrupted by the edict of the regent, Law's project was too insecure in principle to have proved permanent. The favourite maxim inculcated by Law, and upon which his whole fabric of the Mississippi system was reared; namely, that the power and prosperity of a nation increase in proportion to the quantity of money circulating therein, and that, as the richest nations have not specie sufficient to afford full employment to their inhabitants, this defect may be supplied by paper credit; involves a dangerous fallacy, even in the most restricted view that can be taken of its application, inasmuch as it implies

that paper money may be issued with advantage to an almost unlimited extent, upon general security; and that its credit, or, in other words, its value, may thus be maintained without its being rendered convertible at pleasure into cash. But all experience has proved that this is absolutely impossible. When paper is in excess, in comparison with the total amount of gold and silver currency, it necessarily becomes depreciated; the prices of commodities experience a corresponding rise; the nominal value of the precious metals is increased in proportion to the amount of the depreciation, of which this increase is the only measure, and they disappear from circulation. All existing contracts and obligations are disturbed; debtors benefited at the expense of creditors; a spirit of reckless speculation and adventure is thus engendered; and, after a time, the crisis of revolution and ruin arrives. Whenever the quantity of money in circulation is too great in proportion to the total amount of commodities to be circulated by it, depreciation is the necessary consequence, or, in other words, a proportional rise in the price of commodities. Money has no creative power, as Law seems all along to have imagined, and can never be in excess without endangering "the power and prosperity" of the nation where this is the case. His whole system, therefore, was built upon a sandy foundation, and, even if it had received no rude or sudden shock, would have fallen to pieces from its own insecurity and instability. At the same time, there is much truth in an observation of Mr Burke, in his *Reflections on the French Revolution*. "It is not true," says he, "that Law built solely on a speculation concerning the Mississippi; he added the East India trade, he added the African trade, he added the farms of all the farmed revenue of France; all these unquestionably could not support the structure which the public enthusiasm, not he, chose to build on these bases. He laid the best foundation that he could, perhaps the best which, in the circumstances, it was possible to lay; but the nation went suddenly mad, an event which he could scarcely have foreseen; the company was hurried onwards by the general frenzy; and when the delirium had reached its height, the regent was advised to issue the fatal edict, which levelled the whole fabric to the dust.

(See *Œuvres de Law*, passim; *Histoire du Système des Finances*, tom. i.; Pollnitz, *Mémoires*; Massillon, *Mémoires de la Minorité de Louis XV.*; *Mémoires de la Régence de M. le Duc d'Orléans*, tom. i.; Richelieu, *Mémoires*, tom. iii.; Voltaire, *Siècle de Louis XV.*; Chalmers's *Biog. Dict.*, art. "Law;" Wood, *Life of John Law of Lawriston*, Edinburgh, 1824.) (J. B—E.)

LAW, Edmund, Bishop of Carlisle, was born at Cartmel, in Lancashire, in 1703. After attending school at Cartmel, and afterwards at Kendal, he finished his education at St John's College, Cambridge, and was soon after elected a fellow of Christ College. While residing at Cambridge, he published a translation of Archbishop King's *Essay on the Origin of Evil*; and this raising a controversy between him and Dr Clarke, led soon afterwards to the publication of his *Inquiry into the Ideas of Space, Time, &c.* To

¹ Even in this season of calamity, the French exemplified the indestructible gaiety of their national character, by sporting with their own misfortunes in jests and epigrams. The following hebdomadal record is, perhaps, unique amongst *jeux d'esprits*.

Lundi j'achetai des actions;
Mardi je gagnai des millions;
Mercredi j'arrangeai mon ménage;
Jeudi je pris un équipage;
Vendredi je m'en fus au bal;
Et Samedi à l'hôpital.

The Abbé, afterwards Cardinal, de Tencin, having had the principal share in Mr Law's conversion, a service for which he was rewarded by the bishopric of Grenoble, is thus addressed by a malicious epigrammatist:—

Foin de ton zèle séraphique,
Malheureux Abbé de Tencin!
Depuis que Law est Catholique,
Tout le royaume est Capucin.

Law,
William
||
Lawn.

this is added a valuable dissertation by Waterland, containing one of the happiest refutations of Clarke's *a priori* demonstration. His edition of Stephen's *Thesaurus* was printed about the same time. In 1737 the University presented him with the living of Graystock, in Cumberland; and to this were added in 1743 the archdeaconry of Carlisle, and the living of Salkeld, a village on the River Eden. Living in retirement at this village, he wrote *Considerations on the Theory of Religion*, with *Reflections on the Life and Character of Christ*. In 1756, upon his succeeding Dr Keene as master of Peterhouse, Cambridge, he resigned his archdeaconry, and in 1760 became principal librarian of the university, and afterwards professor of casuistry. In a few years more, honours came rapidly upon him. He was presented with the archdeaconry of Staffordshire, and a prebend in the church of Lincoln. To a stall, obtained in 1767 in the church of Durham, was added in the following year, through the recommendation of the Duke of Grafton, the bishopric of Carlisle. Law had chosen Locke for his master in philosophy; and in 1777 he published an edition of that philosopher's works in 3 volumes with a preface and a life of the author. He died at Rose Castle, his episcopal residence, in 1787, in his eighty-fourth year. Bold and independent in speculation, and tenacious of his own dogmas, Law was still tolerant of the opinions of his opponents, and treated them with respect and candour. His openness to conviction was shown in the important alterations he made in the second editions of his two principal works. Among other peculiar tenets, he holds that without Divine interposition the dead would continue for ever in that state of insensibility which is the result of the fall. In disposition he was cheerful and contented; but his bashfulness and his fondness for literary ease, rendered him too inactive and too facile for his high position in the church.

LAW, William, a well-known religious author, was born at King's Cliff, Northamptonshire, in 1686. He entered Emmanuel College, Cambridge, in 1705; and, with the intention of taking orders, passed through the necessary degrees. He was elected a fellow in 1711, and took the degree of M.A. in the following year. On the accession of George I. he refused to take the prescribed oaths and declaration, and in consequence vacated his fellowship in 1716. After officiating for some time as a curate in London, he went to reside at Putney as tutor to the father of Gibbon the historian. It is not known how long he continued in that situation; but it is certain that he left it about 1740, and retired, along with Hester Gibbon, his ward's sister, and another lady, to his birthplace, for the purpose of leading a retired and charitable life. There he had founded, in 1727, an hospital and a school. After a twenty years' residence, he died on the 19th of April 1761, in the seventy-fifth year of his age.

Law's character is clearly indicated by his published works. It is thus pointedly described by Gibbon in his *Miscellaneous Works*:—"In our family he left the reputation of a worthy and pious man, who believed all that he professed, and practised all that he enjoined."

His works extend to 9 volumes octavo, embracing sixteen treatises and a collection of letters. The most popular are the *Serious Call to a Devout and Holy Life* and the *Practical Treatise upon Christian Perfection*. To the former Dr Johnson attributed his having been led to think earnestly about religion. The *Three Letters to the Bishop of Bangor* are, perhaps, the most powerful of his productions, and very valuable as specimens of a high style of controversy comparatively rare in any language. His *Reply to Mandeville's Fable of the Bees* has been lately republished in a separate form, with an *Introductory Essay*, by F. D. Maurice.

LAWN, fine linen or cambric. See LINEN.

LAWRENCE, SIR THOMAS, a celebrated English painter, was born at Bristol, on the 13th of April 1769. His father, who kept an inn, first in Bristol, and afterwards in Devizes, made some pretensions to literary taste, and was in the habit of reciting poetry; an accomplishment which his son acquired at a very early age, as well as that of taking likenesses with striking fidelity. One of the earliest instances recorded of young Lawrence's genius is to be found in an incident which occurred to Lord and Lady Kenyon, some years previous to the time when the former was elevated to the peerage. Happening to remain for a day at the inn of the elder Lawrence, they were introduced by Boniface to his son, who, he said, "although then only in his fifth year, could recite them poetry or speeches, or take their likenesses." The visitors agreed that the boy's skill with the pencil should be put to the test; and the future president having been lifted on the table, and seated in an arm-chair, took their likenesses with a rapidity, a spirit, and a correctness, which astonished them. With the exception of a few lessons in Latin and French, obtained through a private channel, all the education which young Lawrence received, he acquired between his sixth and eighth year; but his was a mind capable of educating itself, and long ere the young artist attracted public attention, he had treasured up more than an ordinary stock of knowledge. But drawing, particularly taking likenesses, chiefly occupied his attention until he was ten years of age, when he began of his own accord to attempt original compositions of the highest class. The subjects which he chose were of the most ambitious description, such as Peter denying Christ, Haman and Mordecai, and the like. His fame as an artist now spread amongst the families of distinction in the surrounding counties; and not long afterwards, the Honourable Daines Barrington noticed him in his *Miscellanies*, as a striking instance "of early genius in children." The elder Lawrence having failed in business, removed to Bath, where he placed his son for some time with a celebrated crayon painter, under whom he made surprising progress. At this time he executed, at half a guinea each, likenesses of the fashionables of Bath; and this initiatory exercise in drawing individuals in high life, arrayed in their gay and elegant costume, had, doubtless, considerable influence in forming the style of the artist, and preparing him to become the painter of patricians. He now numbered amongst his warm admirers and patrons persons of rank and fortune; but the most remarkable incident in his early career, was his receiving the great silver pallet from the Society of Arts, with a present of five guineas. These marks of distinction were conferred upon him for executing in crayons the Transfiguration of Raphael, when he was only thirteen years of age. His large crayon drawings became in great request; and in Oxford, Salisbury, and other places which he visited, he obtained considerable employment for his pencil. When in his sixteenth year, he conceived a strong desire to appear upon the stage; but the remonstrances of his friends induced him to abandon this project; and about a year afterwards, he made his first attempt in oil painting. In 1787 he removed to London, where he availed himself of the public institutions for instruction in his art, and commenced that career which terminated so triumphantly. He was received at the house of Sir Joshua Reynolds, and encouraged by the great head of the English school of art. His admission as a student at the Royal Academy, and his first appearance in the exhibition at Somerset House, soon followed his arrival in the metropolis. Each succeeding year he increased the number of the performances which he sent in: and his reputation growing apace, he was elected an Associate of the Royal Academy on the 10th of November 1791. The death of Sir Joshua Reynolds in 1792 opened up a fair field of competition for aspiring genius; and although

Lawrence. Mr Lawrence was then only in his twenty-third year, it soon became apparent that he was destined to bear away the palm from the most gifted artists with whom he had to contend. The Dilettanti Society unanimously chose him as their painter in the room of Sir Joshua; and his Majesty George III. also appointed him to succeed the deceased president, as his principal painter in ordinary. On the 10th of February 1794, Mr Lawrence was elected a royal academician; and employment now flowed upon him from all quarters. He made the most rapid progress in his profession, and his reputation grew steadily until he came to be generally considered as the first portrait-painter of the age. An enumeration of the works of this description which he executed would comprehend all the rank, fashion, and intelligence which distinguished the times in which he lived, including those of most of the crowned heads of Europe. The royal family, the nobility and gentry, distinguished men of letters and statesmen, actors and actresses, all sat for their portraits to Lawrence. It may be justly said of him as it was said of Sir Joshua Reynolds, that "he painted three generations of beauties." In 1815 the Prince Regent conferred on him the honour of knighthood; and in 1818, at the request of the same illustrious individual, he was induced to proceed to Aix-la-Chapelle, to take likenesses of the most distinguished statesmen who had there assembled for diplomatic purposes. Having executed his mission at Aix-la-Chapelle, Sir Thomas proceeded to Vienna, and thence to Rome, where he had an opportunity of contemplating, for the first time, the great masterpieces of ancient art. During the whole of his residence on the Continent, he was received by the sovereigns of the different countries he visited, and entertained with marked distinction; and the propriety and elegance of his deportment made an impression highly favourable to his character as an English artist and gentleman. After an absence of eighteen months he returned to England; but, before reaching his native country, he had been unanimously elected to succeed Mr West as president of the Royal Academy; and this office he continued to hold till his death, which took place on the 7th of January 1830.

In portrait-painting, the branch of art which he made his profession, Sir Thomas Lawrence was the most distinguished artist of the day. He was one of the few English painters who attained a proficiency in their art before visiting Italy, or without studying the old masters; a circumstance which must be attributed to his strong native genius and exquisite taste. The distinguishing characteristics of his style was the power of conveying a faithful resemblance, with, at the same time, a singularly delicate sense of beauty, grace, elegance, and dignity. An able writer thus speaks of him:—"No painter who ever lived seemed to have dived more deeply into individual character, as conveyed by the conformation of the visage, and the expression of the features; and none knew more skilfully how to avail himself of the changeful appearances which they betrayed in those conversations which were dexterously introduced during the sitting, and which destroyed or relaxed a rigidity of muscle assumed on such occasions, and which frequently baffles the utmost ingenuity of the artist. In his female portraits (the great test of talent) he had more grace and a greater variety of attitude than Vandyke, although he certainly did not equal him in colouring. It is a general opinion, also, among painters, that he had less nature and less breadth than Sir Joshua Reynolds; and that opinion is probably well founded. Sir Thomas, especially, in the latter periods of his practice, exhibited more detail in his portraits, and appeared to paint with a smaller pencil, than his illustrious predecessor, who, in his effects of light and shade, seemed to take Correggio as his model. The hair in Sir Thomas's pictures was painted in fine masses, in a way peculiar to himself; and his eyes, to the splendour of

which he sometimes made great sacrifices, were divine. Lawrence, The late Mr Fuseli, who was by no means a thorough-going admirer even of Sir Thomas, has been heard to say of him, 'But he paints eyes better than Titian.'

His drawing was admirable, and some of his chalk sketches are considered by the best judges as fine as Michael Angelo or Raffaele could have executed. Sir Thomas did not confine himself to portrait-painting alone, but executed paintings of a far higher order of art. Of these it has been observed by Mr Westmacott, "His illustrations of Cato, Coriolanus, and Hamlet, may be considered historical works, and examples of his creative genius, possessing a vigour of imagination, a propriety of sentiment, a breadth and chasteness of composition worthy to be ranked with the classical and distinguished efforts of the sixteenth century; whilst his more comprehensive powers were displayed in the admirable picture of Satan: all eminent proofs that he possessed talents equal to the accomplishment of the highest designs in the art." In private life Sir Thomas Lawrence was most exemplary, being kind and liberal to artists, and ready to encourage rising merit. In discharge of his duties connected with the high station which he filled in relation to the academy, he displayed unremitting diligence and zeal; "And no man," says an academical, "died with better claims to the respect of his brother members." (J. F. S.)

LAWRENCE, a manufacturing town of the United States of North America, Essex county, Massachusetts, is situate on the left bank of the Merrimac, 26 miles N. of Boston, and forms the centre of a network of railroads communicating with Lowell, Newburyport, Boston, and other places of importance. Although founded but recently, Lawrence has become one of the chief manufacturing towns in New England, in consequence of the great water-power it derives from the Merrimac. In 1845 the Essex Commercial Company constructed a dam of masonry across this stream, by which a fall of 28 feet was obtained for the whole river. From this dam a canal, from 60 to 100 feet broad, 12 feet deep, and more than a mile long, conducts the water to the various factories situate between it and the Merrimac. The town proper, which is laid out between the latter and a small tributary called the Spicket, has in its centre an open common of 17½ acres in extent, and contains a town-house, gaol, several churches and schools, and a literary institute. The inhabitants are almost all employed in the various factories in the town, some of which are of great size, and one, the Pacific, is said to be the largest in the world. The building has seven storeys, and its flooring covers 16 acres, while the consumption of cotton within its walls amounts to 1,500,000 lb. yearly, and of wool to the third of that amount. It gives employment to about 2000 persons. The manufactures of the town comprise woollen, linen, and cotton goods of various kinds. Incorporated, 1847. Pop. (1848), 6000; (1850), 8283; (1855), about 14,000.

LAWRENCE, St, GULF, an inlet of the Atlantic Ocean, British North America, having Newfoundland on the E., Labrador, Lower Canada, and New Brunswick on the N. and W., and Nova Scotia and Cape Breton on the S.; extending from N. Lat. 46. to 51. 30., and W. Long. 58. to 65. It communicates with the ocean by three channels, the principal of which is between Cape Breton and Newfoundland, 48 miles in width at its narrowest part. The other two channels are much narrower; the Straits of Belle Isle, between the N. extremity of Newfoundland and Labrador, being 10 miles, and the Gut of Canso, betwixt Cape Breton and the mainland, being only about half a mile in width at the narrowest part. The gulf is about 300 miles in length from N. to S., by 240 miles in breadth, and incloses numerous islands, the chief of which are,—Anticosti in the N., the Magdalen group in the centre, and Prince Edward's Island in the S. The estuary of the St Lawrence River debouches into the

St
||
Lawrence,
St, Gulf.

Laybach
||
Lead.

gulf at the western extremity of Anticosti; although, properly speaking, this fiord is an inlet of the gulf as far up as the River Saguenay. Navigation is suspended here during winter and early spring, from the prevalence of ice, which is especially dangerous in the entrances to the gulf. Fogs, also, are very frequent during the prevalence of the E. winds in spring. In summer, however, the W. and S.W. winds render navigation comparatively safe. The fisheries, which are very valuable, are prosecuted with assiduity by the colonists as well as by United States companies. Herring, cod, and mackerel abound.

LAWRENCE, *St.* See CANADA.

LAYBACH (ancient *Æmona*), a fortified town of Austria, capital of Carniola, and of the former kingdom of Illyria, is situated on a navigable river of the same name, an affluent of the Save, 52 miles N.E. of Trieste; N. Lat. 46. 48., E. Long. 14. 30. The town and its suburbs stand on both sides of the stream, which is here crossed by several bridges. The castle, on a hill around which the largest part of the town is built, is now used as a prison. Among its public buildings are,—the cathedral, several churches and religious houses, Auersberg palace, a lyceum and gymnasium. A pillar stands in the market-place, raised in honour of the "Lady Conqueror of the Moon," *Mondbezwingerin*, a statue of whom is said to have rallied and led on the inhabitants when they were dispirited and had lost their general in one of the Turkish invasions. Laybach is the see of a bishop, and contains the law courts of the province. Its manufactures, which are unimportant, include porcelain, linens, and refined sugar; and it carries on an active trade in flax, grain, and wool. The Vienna, Bruck, and Trieste Railroad passes through the town. It is celebrated for a congress held here in 1821. Pop. (1851), 17,256.

LAZARITES, *THE*, an order of priests appointed by Vincent de Paule, and deriving their name from the Priory of St Lazarus, at Paris. Their mission was instituted in 1624, and in 1632 it was sanctioned by Urban VIII. The Lazarites suffered considerably as a body during the French Revolution, but after 1816 they were restored to their former position, and took an active part in the political movements which preceded 1830. In Poland they are numerous and influential, and their influence has been banefully exerted in retarding the progress of science. They have a footing in Spain and Austria; and in the East they have a mission in China.

LAZZARONI. See NAPLES.

LE, or LEE, the capital of Ladak, in Central Asia, is situated in a narrow sandy plain between the right bank of the Upper Indus, and a chain of mountains which rise on the N. to about 2000 feet; N. Lat. 34. 10., E. Long. 77. 38. It is 10,000 or 11,000 feet above the level of the sea, and is surrounded by a wall with towers, extending on either side to the summit of the neighbouring hills. The streets are narrow and irregular, and in some cases covered over to protect passengers from the sun's rays. The houses are from one to three storeys in height, built partly of stone and partly of unburnt brick. There are no chimneys, and the furniture is very rude and scanty. The only conspicuous building in the town is the rajah's palace, a square massive edifice, several storeys in height. Le is the seat of an active trade. Pop. about 4000.

LEAD, a simple metal of a bluish-white colour, of the specific gravity 11.44; its chemical equivalent is 103.57, and its symbol Pb, from *plumbum*. It is so soft as to be cut by the nail, to take impressions, and to leave a streak on paper. Its ductility and tenacity are low, but it admits of being rolled into sheets, and drawn into wire. Its fusing point is 620° F. It contracts considerably in passing from the fluid to the solid state, and hence is not well fitted for castings. It is an inferior conductor of heat and electricity. By being repeatedly heated and cooled, it becomes perma-

nently enlarged; whence the puckered appearance of the lead lining of sinks, &c., which are exposed to the action of hot and cold water. Lead.

There are four oxides of lead, only one of which, the *protoxide*, PbO, has basic properties.

Metallurgy of Lead.—The ore which supplies the greater portion of the lead produced in this country is *galena*, or the native sulphuret. The chief lead mines are in Derbyshire; but there are also mines at Allandale and other western parts of Northumberland; at Alston Moor, and other parts of Cumberland; in the western parts of Durham; in Swaledale, Arkendale, and other parts of Yorkshire; in Salop; in Cornwall; the Mendip Hills in Somersetshire; and in the Isle of Man. The Welsh mines are chiefly in Flint, Cardigan, and Montgomery shires; the Scotch in Dumfries, Lanark, and Argyll; and the Irish in Wicklow, Waterford, and Down.

Galena, when pure, consists of lead 86.55, and sulphur 13.45. It usually contains silver, and hence obtains the name of *argentiferous galena*. Galena crystallizes in the cubic system, and is deposited on a matrix of quartz, carbonate of lime, fluor-spar, or baryta. In the West of England the lead mines occur in clay-slate; in Derbyshire, and other northern districts, in limestone.

Preparatory to smelting, the ore is picked, broken, and washed, to separate earthy and stony matters; it is next roasted at a moderate heat, so as to allow of oxygen being absorbed, whereby about one-half of the ore is converted into sulphate of lead; this is mixed up with the unaltered portions, and the temperature is rapidly raised, so as to run the two together, when sulphurous acid gas escapes, and pure metallic lead remains behind. In this process the sulphur of the unaltered portion of the ore unites with the sulphur and oxygen of the other portion.

The furnace employed is represented in vertical section (fig. 1). Its sole is made up of the fused slags of former

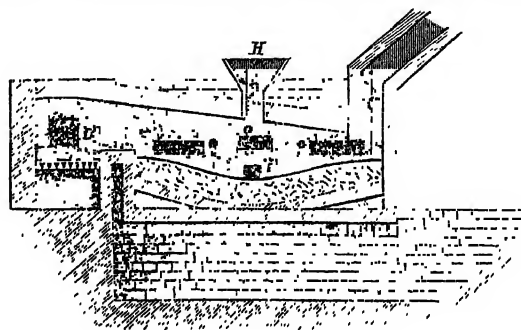


Fig. 1.

operations, and the centre is hollowed, for the purpose of collecting the fused metal, which is drawn off by the tap-hole T, into a cast-iron pan on the outside. The arch of the furnace is depressed, so as to bring the flame of the fire into contact with the charge; this is let in by the hopper H, and is spread about and worked by means of iron paddles through the openings O, O, which also serve to supply air to the charge. At D is an opening for feeding the fire; C is the chimney; it is connected by means of flues, with condensing chambers, which prevent the poisonous lead fume from escaping into the surrounding district.

The charge varies from 12 cwt. in the north of England, to from 20 to 24 cwt. in Wales. It is spread evenly over the sole, and occasionally stirred for the purpose of bringing fresh surfaces to the air. After about two hours, some of the rich slags of former operations are thrown in. These quickly give up their metallic lead, and it is run out through the tap-hole. The heat is increased, and as the charge fuses, it is properly distributed over the sole. As the lead begins to collect at the lower part of the sole, quicklime

Lead. is thrown upon it, and, as the slags flow to the depression, they are pushed back to the fire-bridge. After from 3 to 3½ hours, the openings are closed, and the heat is urged for about three-quarters of an hour. After this the charge is again *rubbled*, to assist the flow of metallic lead into the hollow; the slags are pushed back, quicklime is added to set free a portion of the oxide of lead, and to reduce the liquidity of the slags, and allow of their being easily removed. The oxide reacts on any portion of the sulphuret not decomposed during the roasting; but it is now time to reduce the oxide, which is partly effected by the addition of powdered coal, and also by urging the heat for about 40 minutes, after which the furnace is tapped, and the slags, dried by a further addition of quicklime, are removed. From 7½ to 10 cwt. of coal are required for each ton of ore smelted, and the *shift* of the furnace, including the casting of the lead into pigs, occupies from 5½ to 7 hours. If the lead contain antimony or tin, which often happens with Spanish ores, it has to be refined by an operation called *improving*. The lead is melted in a shallow cast-iron pan set in the bed of a reverberatory furnace, and kept in that condition until the antimony and tin, which are more oxidizable than lead, have been entirely removed in the pellicle of oxide, which continually forms on the surface, and is frequently raked off. A sample of the lead is examined from time to time, and when it exhibits a peculiar flaky crystalline appearance on the surface, the metal is run off and cast into pigs.

Galena always contains a small proportion of sulphuret of silver, the proportion being subject to considerable variation; an ore which yields 120 oz. of silver to the ton, or 0·36 per cent., is very rich. Formerly the silver was extracted in a cupel furnace, called a *refinery*, in which the process of cupellation, similar to that described under ASSAYING, was conducted on a large scale. Of late years, however, a simpler and more economical process has been adopted, based on the fact noticed by Mr Pattinson of Newcastle, that if fused argentiferous lead be briskly agitated during its slow cooling, a portion of the metal solidifies in the form of crystalline grains, which subside. These crystals consist of lead nearly free from silver, the fusing point of the argentiferous alloy being lower than that of pure lead. All, therefore, that is necessary, is to separate the crystals thus formed, and in proportion as this is done, the liquid mass left behind becomes rich in silver. In Mr Pattinson's process, eight or nine cast-iron pots, each containing about 5 tons of fused metal, are set in a row, with a separate fire beneath each. A charge is introduced into the middle pot, and when it is fused the fire is put out, and the metal is briskly stirred during the cooling. As the crystals subside, they are removed by means of a large perforated iron ladle, and transferred to the next pot on the right hand. When about ¼ths of the metal have thus been removed, the argentiferous alloy is ladled out into the next pot on the left hand, and a fresh charge is added to the centre pot, which is treated as before. When the pots on the right and on the left hand have received a sufficient charge, either of very poor or of very rich alloy, they are submitted to a similar process, the concentrated argentiferous portion is again passed on to the next pot on the left, while the crystalline, or poorer portion, is transferred to the next pot on the right. At length the last pot on the left may contain lead with 300 oz. of silver to the ton, and it has not been found desirable to concentrate it beyond this point; the last pot on the right may contain lead with not more than ½ oz. of silver to the ton. This is cast into pigs for the market, and the lead is found to be greatly improved in quality by the process. Lead which contains from 3 to 4 oz. of silver to the ton, admits of being profitably worked for the sake of the silver, while by the old method of cupellation, ores containing less than 20 oz.

of silver per ton scarcely paid the expense of extracting the silver. The process of cupellation may, however, be profitably employed on the rich silver alloy contained in the extreme left hand pot. This process is based upon the fact, that lead by exposure to a current of air at a high temperature absorbs oxygen rapidly, and becomes converted into a fusible oxide, whilst the silver remains unaffected. The oxide of lead, or *litharge*, fuses at a high temperature, and flowing off from the convex surface of the molten metal, constantly presents fresh surfaces to the action of the blast.

In Great Britain, cupellation is conducted in a reverberatory furnace with a moveable hearth or *cupel*, consisting of an oval shallow basin, made of a mixture of bone-ash and a small quantity of wood ashes; the two being slightly moistened, are beaten into an iron ring, about 4 feet by 2 feet; this cupel is supported in the furnace by means of bricks; when dry, the fire is lighted, the heat gradually raised, and the lead placed in the cupel; when melted, a blast of air from a tuyère is made to play over its surface; litharge forms in large quantity, fuses, and flows off through a gutter into an iron pot beneath the furnace. Lead is added from time to time to supply the place of the oxidized portions, until about 5 tons have been reduced to 2 or 3 cwt. The molten mass is run out through a hole made in the bottom of the cupel; the hole is then closed with fresh bone-ash, and another charge introduced. When sufficient metal has thus been collected to produce from 8000 to 5000 oz. of silver, the process is repeated in order to remove the last portions of lead. This separate process is found desirable, since towards the end of the process the litharge carries much silver with it, which litharge is reduced, and the silver obtained from it as before. The litharge obtained from the first process is sold as such, or it is reduced in a small reverberatory furnace by means of powdered coal or anthracite. The porous cupels are also passed through the furnace, in order to obtain the metal absorbed by them. In the earlier stages of the process, the litharge forms on the surface of the melted metal as quickly as it flows off; but when nearly the whole of the lead has been oxidized, the film becomes thinner and thinner, and at length thin enough to exhibit the beautiful iridescent tints of Newton's rings. The last film suddenly breaks up, and reveals the brilliant surface of the metallic silver, known as the *fulguration* of the metal, and this indicates the completion of the process.

In the N. of England the galena is first roasted, and then reduced in a small square blast furnace or forge-hearth, known as the *Scotch furnace*. The rectangular cavity of masonry C (figs. 2, 3), is lined with cast-iron, and the sole-plate S is of the same material, furnished with an upright

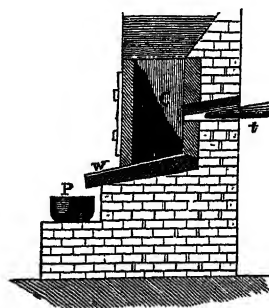


Fig. 2.

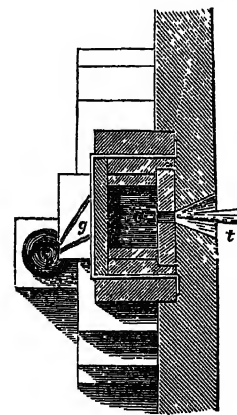


Fig. 3.

ledge at its back and two sides. The sole-plate is brought

Lead.

forward to the front of the hearth, or a separate cast-iron plate is attached to it, called the *work-stone* W (fig. 2). This also has a ledge, except towards the sole. The whole plate is set with a slope, so that the hinder ledge is about $4\frac{1}{2}$ inches above the surface of the hearth. The reduced metal accumulates until it rises above the raised ledge, when it flows out by gutters *g* (fig. 3) in the work-stone, and is received into the melting-pot P. Above the hinder ledge of the sole is a block of cast-iron called the *back-stone*, and on this is the tuyère *t*: on this is another piece of iron called the *pipe-stone*, furnished with a cavity below for the passage of the tuyère. The back wall of the furnace is crowned by another piece of cast-iron, called the *back-stone*. The ledges of the two sides of the sole support bearers of cast-iron, above which, resting on fire-bricks, is another piece of cast-iron, called the *fore-stone*, while the space at each end of the fore-stone is closed by a cube of cast-iron, called a *key-stone*; two similar stones fill up the space between the fore-stone and the back part of the furnace. The front of the furnace is open for about 12 inches from the lower part of the front cross-piece or fore-stone, to the upper part of the work-stone, through which opening the workman operates. The fume is prevented from escaping into the smelting-house by means of a hood of masonry or brick-work.

The ore is first roasted on a long flat hearth, covered by a low arch, and heated by a fire at one end, the object being partly to oxidize and to get rid of sulphur. The roasting occupies from two and a half to three hours, on a charge of from 9 to 11 cwt., and the heat is managed so as not to fuse the galena; while the refuse of the ores, and other matters, are agglutinated so as not to be carried off by the blast. After a charge has been run out of the smelting furnace, a portion of imperfectly reduced ore remains behind; it is called *browse*, and is mixed with coke and clinkers, and used in the next charge. A quantity of peat, in blocks, is also built up in the furnace, near the front; this is ignited by means of a lighted peat, thrown in before the tuyère *t*, a small portion of coal is next added, and then some of the browse. The matters on the hearth are next raked out upon the work-stone; the refuse of the ore, or *gray slag*, which is more resplendent than the browse, is removed and thrown outside to the right, while the browse is returned to the furnace with a small portion of coal. A peat is put before the tuyère to prevent it from choking, and also to diffuse the blast. Quicklime is added, if necessary, to solidify the slag of the browse, or to render more fusible any silica, alumina, or iron, which may be present in the ore. The gray slag is treated in a slag-hearth at a stronger heat. The browse being returned to the furnace, some of the ore is strewed over it, and in about a quarter of an hour the materials are again raked upon the work-stone, the gray slag is removed, while a quantity of metallic lead passes off by the channels *g*, into the pan. Another peat is put before the nozzle of the blast, coal and quicklime are added, and the browse is returned to the furnace, with a fresh quantity of ore. After another interval of about a quarter of an hour, the slag is once more separated, and another quantity of metallic lead flows into the pan. This mode of working is continued about fifteen hours, during which from 20 to 40 cwt. of lead, and upwards, are produced. The lead is of excellent quality, since, on account of the low temperature employed, metals of high fusing points, with which the ore may be contaminated, remain behind, and only the lead and silver escape into the pan. The furnace in which the slags are reduced is in the form of a rectangular prism 26 inches in length, 22 in breadth, 33 in height. The bottom inclines slightly from the tuyère towards the front, the fire-hearth is formed of two stout plates of cast-iron, 26

inches by 12 inches, supported by bearers at the sides. A space of about 5 inches is left between these plates, or *stones*, as they are called, and the bottom of the furnace, and there is also a row of fire-bricks between. Preparatory to working the furnace, the bottom is covered with cinders, beaten together, and the pot which receives the lead is filled with them. Peats are next added to the furnace and ignited, then comes a layer of coke, and when the heat is sufficiently strong the slags are added. The space is kept filled with alternate layers of coke and slag, and as the slag melts, the lead contained in it filters through the bed of peat cinders, while the more viscid slag remains behind. The slag is run out by perforating the coke bed with a bent iron rod, and after passing over the surface of the pot which receives the lead, it escapes into a large iron cistern, sunk in the earth, containing cold water, which causes the slag to fly to pieces, thus fitting it for washing and other mechanical processes for separating any metal which may yet remain in it. The high temperature necessarily employed in the slag-hearth deteriorates the quality of the lead produced. This furnace is also employed for reducing certain ores which are not rich in metal, and also for some of the carbonates in which silver is an object rather than lead.

The neighbourhood of lead works is liable to contamination from the escape of lead fume. Professor George Wilson states that, in 1851, he had within five months to make a series of analyses with reference to the deaths of thirteen horses and several cows, which were supposed to have been poisoned by compounds of lead, transferred by the air or the water to the fields in which they were pastured. The grass of such fields was found to be impregnated with carbonate of lead; and in two cases the water drunk by the animals was found to be contaminated with the water used in washing the ore. Lead was found in several of the organs of the animals, especially the spleen, which, from its small size, spongy texture, and comparative freedom from fatty matter, admits of being rapidly and satisfactorily examined; and lead being found in this organ, it would not, in general, be necessary to seek for it in other organs.¹ At some works attempts are made to condense the fume, by making the flues of the furnaces communicate with chambers in which cold water showers down from the roof; at other works, the gases from the flues are drawn through cold water. At the Duke of Buccleuch's works at Wanloch, in Dumfriesshire, the condensing apparatus, constructed about 100 yards from the smelting furnaces, consists of a rectangular block of masonry about 30 feet high, divided by a partition into two chambers, the first of which, the *condensing chamber*, receives the fumes from the furnaces through a large pipe; while the second, called the *exhausting chamber*, communicates with a lofty chimney. The condensing chamber is formed into two distinct compartments, by means of a pair of vertical walls, placed 2 feet from each other so as to form a kind of flat pipe, open at the top, and running the whole width of the chamber, into which water falls in drops, produced by passing the water through a filter of pounded coal, situate in the upper part of the flat pipe. The condensing chamber is further divided into five compartments, each 6 feet high, by means of four horizontal floors, the last compartment corresponding to a bed of coals which forms a filter for the smoke. When the smoke enters the condensing chamber, it has to pass in zig-zags through the five compartments, and then through the bed of coal, on its way to the exhausting chamber. The opening which conducts the smoke from the exhausting chamber to the chimney is situate in its lower part, so that the smoke has to pass through the whole of the exhausting chamber where it

Lead.

¹ *Monthly Journal of Medical Sciences* for May 1852.

Lead. meets with an abundant shower of rain. This shower is regulated by a contrivance in the upper part of the chamber, where the top is covered with a large iron lid with twelve grooves about an inch wide. This lid is furnished with a slide, with openings of the same size, and moving upon it so as to open or close the grooves, while a current of water, being conducted from the upper part of the chamber, falls at intervals through the openings, and produces a copious shower in the chamber. "The atmospheric pressure acts on each movement of the slide with a force resembling that of a blast of an iron furnace, and produces an action sufficiently powerful to mix the impure vapours with the water, so that smoke at length passes into the atmosphere deprived of its injurious properties. The saturated water proceeding from these chambers is afterwards conducted into a reservoir, where it deposits the particles of lead salts that the fumes had carried off."¹ In the Great Exhibition, specimens of fume, thus recovered, were shown, containing 33 per cent. of pure lead, and about 4 oz. 17 dwts. 7 grs. of silver per ton. It is stated that the results of the above arrangement are most beneficial to the surrounding district. Formerly the noxious fumes poisoned the neighbourhood, burnt up the heather, destroyed the vegetation, and rendered it impossible for a beast to graze, or a bird to feed, near the spot. The heather now grows in luxuriance close to the works, sheep graze within a stone's throw of the chimney shaft, and game seek cover on all sides.

About 55,000 tons of lead are annually raised in England, from which about 150,000 oz. of silver are produced. In the year ending 31st Dec. 1855, the quantity of lead exported from the United Kingdom amounted to 22,353 tons, of the declared value of £512,426. In 1854, 19,605 tons, and in 1853, 16,242 tons, were exported.

In Germany, and some other parts of Europe, where poor ores of lead are treated, the sulphurets are reduced by means of granulated metallic iron; the iron combining with the sulphur of the lead forms a fusible sulphide of iron, and the lead is set free. This method is useful where the ores are largely mixed with silica, which, under the English method, would combine with oxide of lead, and form a fusible slag.

Metallic lead is used in the arts in the form of sheets for covering roofs and pipes for conveying water; also in the manufacture of shot, type-metal, solder, &c.

When lead is exposed to the action of air and pure water, it is partly corroded, and hence lead pipes and lead vessels for conveying or containing water for culinary purposes, may act as sources of poison. By such exposure the lead becomes converted at the surface into an oxide which the water dissolves; the solution absorbs carbonic acid, and a film of hydrated oxy-carbonate of lead is deposited in silky scales; a fresh portion of oxide is then formed and dissolved by the water; and so on. This action is greatly modified by the presence of different salts in the water, although the quantity may not exceed 3 or 4 grains to the gallon; the corrosive action being increased by the chlorides and nitrates, and diminished by the sulphates, phosphates, and carbonates, so much so, that oxide of lead is scarcely soluble in water containing these salts. Bicarbonate of lime exerts a remarkable preservative influence, and as it is a very common impurity in water, few spring waters exert much action on lead. In such cases a film of insoluble carbonate of lead is formed upon the surface, which serves as a protection to the metal. Rain water which pours into

cisterns from the roofs of houses, is usually sufficiently impure, especially in towns, to reduce its action on the metal. The hydrated oxy-carbonate of lead is the least soluble among the salts of lead; pure water not taking up more than about $\frac{1}{100}$ th of a grain per gallon. By exposure to the air, a solution of oxide of lead, by absorption of carbonic acid, forms silky crystals of the hydrated oxy-carbonate, and in a few hours, only a very minute portion of the metal will remain in solution; but water highly charged with carbonic acid may dissolve lead to a dangerous extent, from the solubility of carbonate of lead in excess of carbonic acid; but, by boiling, the gas is expelled, and the carbonate subsides. Traces of lead may generally be found in water that has been stored in leaden cisterns, so that slate ones are to be preferred. Lead is corroded in the presence of moisture by contact with sulphate of lime; hence, in using it for building purposes, the contact of stucco or plaster should be avoided.²

White Lead.—There is an enormous consumption of lead in the manufacture of white lead, which forms the basis of all ordinary oil paints, constituting at least $\frac{1}{10}$ th of their composition. There are various methods of manufacturing white lead, the two most important of which may be briefly noticed. In the Dutch method, as it is called, which was introduced into England about 1780, and is still carried on at Newcastle-upon-Tyne, and other places, a number of small glazed earthen pots, of the shape shown in fig 4, contain in the lower part a quantity of weak malt vinegar V, and above this is placed a spiral of thin sheet lead L; the pots are arranged in rows, with a plate of lead over each, and then in tiers to a height of 18 or 20 feet, and covered up with fermenting tan, partly new and partly spent, or with decomposing stable manure; the moderated warmth thus produced causes the vinegar to evaporate, and, under the united action of the air and the acid fumes, an oxide of lead is formed on



Fig. 4.

the surface of the metal, which oxide, combining with the acetic acid, forms a basic acetate of lead; the carbonic acid from the decomposing hot-bed converts this salt into carbonate of lead, whilst the neutral acetate again combines with a fresh portion of newly-formed oxide and forms the sub-acetate, which is again decomposed; in this way decompositions and recompositions take place in succession, the neutral acetate dissolving the oxide and forming the sub-acetate, while this is again decomposed under the influence of carbonic acid. In this process the quantity of vinegar required is very small, the function of the acid vapour being to act as a sort of carrier between the carbonic acid evolved from the hot-bed, and the oxide of lead formed under the influence of the acid vapour and the oxygen of the air. One part of pure acetic acid to 100 parts of lead, is sufficient for carrying on the process. The carbonate of lead slowly forms a compact layer on the surface of the coils, and it breaks off in flakes on unrolling them, forming the dead white colour which is so much in request, notwithstanding its poisonous properties.³ Before it is ready for the painter it is ground up with water into a thin paste, and is then reduced, by successive washings and subsidences, to an impalpable powder, which is collected in earthen pans, and dried at about 190°. When dry the powder gives no signs of crystalline structure, even under the microscope.

During the pulverization, particles of the powder escape

¹ Jury Report of the Exhibition of 1851, Class I.

² Professor Miller's *Elements of Chemistry*, part ii., 1856.

³ The innocuous oxide of zinc has been introduced as a white paint, in the place of white lead, but it has failed from the circumstance of its being partially transparent, so that it does not possess the covering properties, or *body*, of white lead. Moreover, the oxide of zinc will not combine with oil to form a plaster as oxide of lead does; hence it is a long time in drying.

Leander
||
Lease.

town and fashionable watering-place of England, county of Warwick, on the Leam, which is here crossed by two handsome stone bridges, about 2 miles E. of Warwick. In 1811 it had only 60 houses, and 543 inhabitants. It is now a favourite watering-place, and one of the handsomest and pleasantest towns in England. The surrounding country is highly picturesque, while Warwick Castle, Kenilworth, Stratford, &c., are at no great distance. The most elegant houses are mostly in the new town, on the N. side of the river. Among the finest of the public buildings are, the new pump-room and baths, the town-hall, the parish church, Trinity church, and the proprietary college, erected in 1847. The educational and benevolent institutions are numerous. Among the latter is the "Warneford Hospital," endowed by Dr Warneford, for affording to the poor baths and medical advice gratis. The Jephson, Ranelagh, and Priory gardens form delightful promenades. The first is of considerable extent, and has a statue of the founder, Dr Jephson. There are no manufactures of importance in the town, the inhabitants being chiefly dependent on the visitors that resort thither. The ordinary season is from May to October. The springs of Leamington are saline, sulphureous, and chalybeate. Pop. (1861) 15,692.

LEANDER. See HERO.

LEARCHUS, a celebrated Greek sculptor of Rhegium, in the S. of Italy, who seems to have flourished at a very early period, before 620 B.C. He made a statue of Jupiter in bronze, which was seen at Sparta, and which was regarded as the most ancient work of its kind. It was not of one piece, but was made of pieces worked separately, and fixed to one another by means of nails and large hooks, so that the parts could not be separated. It is this species of work which Quatremère de Quincy has perfectly explained, under the name of *Sphurelaton*, in his *Jupiter Olympien*. (Pausanias, iii. 17. See Winckelmann, *Op.* vi. 1, 7.)

LEASE, a word akin to the verb to let (French, *laisser*; German, *lassen*), may be defined as a conveyance by contract from the lessor of lands, tenements, &c., for a given term of years or at will, in consideration of rent paid, or other service rendered by the lessee. As distinct from an assignment, the lessor, in granting a lease, does not part with his interest in the subjects leased, and hence there is no valid lease where there is no reversion; and by virtue of this reversion the lessor is invested with power to distrain in failure of payment or in case of any other breach of fealty. Whatever words be used in granting a contract of lease (the usual form being "demise, grant, and to farm let"), the duties and rights of both parties are secured when there is sufficient evidence of an intent on the part of a proprietor of yielding, and on the part of the lessee of holding, possession for a determinate time. Originally, when no writing was necessary, a valid lease was not completed without actual entry; but now, although a deed is necessary only in a few exceptional cases, arising from some peculiarity in the nature of the property to be leased, leases, like other covenants, are generally made by deeds. The conditions on which a lease is granted may embrace anything that is lawful; and there is no authority which can interfere with the granting of leases on any term by parties who have the complete ownership of the property. In cases where ownership only amounts to a divided interest in the subjects, leases are granted under particular powers according to certain statutes; but certain classes who have only a temporary interest in the property, and hold it, for example, only during a precarious tenure of office, are (as the holders of benefices by 18th Elizabeth, chap. 20) restrained from executing deeds of this nature, intended to be valid beyond the period of their proprietary. An act passed in 1845 (8th and 9th Vict., c. 124) has for its object the simplification of the terms used in granting leases. Without rendering invalid the forms previously in use, it

Lease.

gives schedules of abbreviated expressions which are considered to be equally legal with the older and more cumbersome forms, and when taxed are, *ceteris paribus*, to be regarded as involving equal merit by the taxing officer. This act, however, does not extend beyond England.

In Scotland the first statute in favour of tenants was that of 1449, c. 17, which secured them against purchasers of the lands, until the expiry of their lease, provided they paid their rent to the new proprietors. Before that date a lease was disregarded in a competition with a subsequent proprietor, whose titles were completed by charter and sasine. To bring the lease under the protection of the statute, it must be granted by a legally qualified party,—it must be in writing, and definite as to rent, and term of endurance. The tenant must also be in actual occupancy under it. Though these conditions are required to render the lease available against third parties, who subsequently become proprietors, they are not required for the purpose of protecting the tenant against the granter of the lease and his heirs. A perpetual lease, or one with a nominal rent, or which directs the rent to be disposed of otherwise than in payment to the landlord, or entitles the tenant to demand a renewal for ever, is good, not only against the landlord by whom it was granted, but against his heirs, seeing that his heirs cannot be in a better position than the party whom they claim to represent. To protect the tenant against strangers coming by purchase, or by the act of the law as creditors, into what is called the feudal right to the lands, it is necessary that the granter of the lease have his own title, as proprietor, made up by charter and sasine, or at least that that be done before the ownership of the lands passes out of his hands. If the granter be a pupil, a lease cannot last longer than the office of his tutor; but minors, that is boys above fourteen, and girls above twelve years of age, may, with consent of their curators, grant leases to endure after their majority, provided the terms be just and equitable. If the terms be injurious to the minor, the lease may be set aside on that ground, if challenged by an action at law raised within four years after the minor attains majority. A lease granted by an heir, who, in virtue of his apparenancy, has been three years in possession, though he may not have made up his title, will be good against a subsequent heir, but not against either an adjudging creditor, or a subsequent proprietor. The owner of an estate who has granted an heritable bond over it, may afterwards grant a valid lease, but not after certain steps have been adopted to recover the debt, commencing by what is called adjudication; nor after the use of inhibition, which is a preventive measure, unless the lease be according to the course of ordinary administration. If the estate of a proprietor be sequestrated for debt, he can no longer grant a lease; neither is one granted on deathbed available to the prejudice of the heir-at-law. A liferent proprietor may grant a lease to terminate at his death. Heirs of entail in possession can only grant such leases as the deeds of entail permit.

As it is presumed, unless otherwise specially provided by the lease, that the tenant is merely entitled to the annual produce of the lands, or occupancy of the houses and the like, it follows, that unless otherwise provided, mines and minerals, trees, the right of hunting, and the landlord's right over the crop of each year in security of the rent of the year of which it is the crop, are reserved to the landlord. The security over household furniture, cattle, or stocking, lasts for three months after the last term of payment of the year's rent. In the use of reserved rights, the landlord must compensate the tenant for any damage which, in the exercise of these rights, he may occasion.

The destination of a lease is matter of arrangement, otherwise it goes to the heir-at-law of the tenant on his death. A tenant's creditors, and even his assignees, as well as his right of subsetting, may be excluded. All questions

Lease. of this kind should be well considered and provided for when the lease is being entered into.

The tenant is bound to stock, manure, and labour the farm according to the rules of good husbandry; and he has right to the annual fruits, and to the occupation of the subject. If the subject be destroyed, as, for example, if a house or mill be burnt down or become ruinous, or a mine becomes unexpectedly exhausted, no rent is exigible. Even where, from some extraordinary calamity, land has become sterile, or, from remarkable inclemency of the weather, the crop is lost, so that the tenant cannot recover the value of the seed, rent cannot be exacted. Where such occurrences as these do not happen, the conditions of the lease must be strictly observed on both sides. The landlord and his heirs must protect the tenant in his possession during the currency of the lease; and the tenant must pay his rent and perform all the other obligations which he has undertaken. It is the duty of the landlord to uphold the subject leased, unless otherwise provided, and the tenant is responsible for such damage as he may occasion, ordinary tear and wear excepted.

We have said that a Scotch lease must be in writing. A verbal lease is in no case binding against any party for more than one year, and a written lease, silent as to the period of its duration, is regarded as being for one year only, or for the shortest period beyond a year that can be construed from its terms. In some cases where money has been expended to a large amount on the faith of a verbal lease, damages may be given; and where it appears that the party challenging a verbal lease, has done some act, plainly in recognition of a succeeding year, the lease will be sustained till the expiry of such succeeding year; but that only in questions with the grantor and his heirs, and not in questions with succeeding proprietors. As a verbal lease may be resiled from after a year, it is not competent to establish a longer duration by a reference to oath. On the other hand, though writing is required, it is not necessary that it should be a formal, or, as the law of Scotland calls it, a probative writing, provided it have been followed by possession of the subject on the part of the tenant. Accordingly, a written obligation to grant a formal lease, followed by possession, will save the rights of the tenant, not only against the grantor and his heirs, but even against third parties who have subsequently become proprietors, provided it expresses the requisites of the Act 1449—namely, a fixed rent, and a definite period of endurance. It is not necessary that the fixed rent be in money; a grain rent, or even service is sufficient; but if the rent be nominal (although no criterion for determining what is elusory, has yet been authoritatively settled), or if the rent is to be retained till a debt due by the landlord is extinguished, the lease will be voidable at the instance of a subsequent proprietor. In the same way, if the term of endurance, though determinate, be unusually long,—such as, while water runs down, or grass grows up,—or if it be renewable for ever, or even for a period unknown in ordinary practice, the lease will be voidable at the instance of a subsequent proprietor, as being substantially destructive of the right of property, though it may be available against the grantor and his heirs. Of course it is otherwise if the purchaser, at acquiring the property, was taken bound to recognise the lease, or, if he afterwards voluntarily homologated it. It is to be regretted that no judgment has yet been given in Scotland fixing the utmost length of lease that shall be available against subsequent purchasers. All, we believe, that can be safely said on this subject at present is, that a lease for twice nineteen years, is usually regarded as suitable where improvements are contemplated; and that in coal or mineral, and building leases, owing to the great expenses involved, an enlarged period, in order that the tenant may be indemnified, is usual. Liferent leases seem to be unobjectionable. Sometimes a lease declares that

part of the rent shall be expended in necessary improvements on the subject leased, and such a lease will be binding against a purchaser, provided the improvements be executed subsequent to the date of his purchase, as they enhance the value of the subject: but if they were executed prior to the date of his purchase, they will not form a claim of abatement from the rent, because it is to be presumed that the purchaser paid an increased price for the improved subject. In this last case the tenant's claim for indemnity will lie only against the seller or his heirs. If improvements to be executed after the date of the purchase, are of an extraordinary character, such as the building of a new house, the purchaser may prevent their being executed, leaving to the tenant his claim of damages against the seller.

A power of assigning a lease, or sub-letting the subject, is not implied, unless the lease be for more than nineteen years, or is given to the tenant in liferent, or unless the subject leased be an urban tenement. An assignment and a sub-lease require for their completion to be followed by possession. The shortest lease, however, may be attached by the tenant's creditors, by what is called adjudication, unless it contain a clause expressly excluding assignees and sub-tenants; and then neither voluntary nor judicial assignees can be received.

When a lease has reached its natural termination, unless it be a liferent lease, it is still held to exist from year to year on its original terms, by what, in Scotland, is called tacit relocation, until either the landlord shall intimate to the tenant, or the tenant shall intimate to the landlord, his intention to have it terminated; and such intimation must be made forty days before the term of Whitsunday of the year in which it is meant to bring the lease to a close. This intimation is called a warning. It may be given many ways. One mode, proceeding on a precept from the landlord, is regulated by the Scotch statute 1555, c. 39. Another mode is regulated by an Act of Sederunt of the Court of Session, dated 14th December 1756. By a recent statute regulating sheriff-court procedure, the length of the warning required by the Act of Sederunt has got six days added to it. Even where there is a regular lease, in which there is generally a clause binding the tenant to remove at its expiry without warning, he is entitled to rely on the lease being continued by tacit relocation, till he receive a regular warning. On such a lease it is competent, prior to the forty days, to give a charge in virtue of letters of horning to remove. A lease may be brought to a close before its natural term, by the tenant's desertion, or failure to pay his rent. In such a case the landlord should apply for judicial authority to let the lands for the unexpired portion of the lease. It is also competent to proceed by a summons before the sheriff, concluding to have the tenant ordained, within a certain time, to stock and plenish the farm, and labour and manure it in terms of his lease; or if the lease be silent as to the mode, according to the rule of good husbandry; and failing his doing so, that he should be removed, and the landlord found entitled to resume possession. The tenant may be removed by a like form of process, if he have subset the farm contrary to the provisions of the lease, or if he have suffered two years' rent to remain unpaid. This last ground of irritancy is provided for by the Act of Sederunt 1756; and unless the arrears be paid before judgment is pronounced, the lease is at an end. Even where a tenant falls into one year's arrear of rent, or deserts his farm at the usual time of labouring it, the landlord may, by the same Act of Sederunt, sue the tenant to find security for the arrears, and the rent of the five following years, within a certain time, to be limited by the sheriff, under pain of compulsory removal. Of course a written lease may be terminated at any time by a written renunciation executed by either party, and accepted in writing by the other.

Lease.

Leather. In urban tenements a warning to remove is sufficient if it be proved to have been given verbally, or by a peculiar form called chalking the door by a burgh officer.

The rights of the feudal superior of the subjects remain always unaffected by any transaction between landlord and tenant.

Leases in general require an *ad valorem* stamp. Leases in consideration of a premium, without any yearly rent, or with a yearly rent under L.20, are charged the same amount, with the exception of leases and tacks for lives, not exceeding three; and leases for a term absolute, not exceeding 21 years, granted by ecclesiastical corporations, aggregate or sole, when the duties on such leases would, under 13th and 14th Vict., c. 97, amount to 35s. or upwards.

STAMP DUTY.	Term not exceeding 30 years.	Above 30 and not above 100.		Exceeding 100 years.
		L. s. d.	L. s. d.	
Rent not exceeding.....L.5	0 0 6	0 3 0	0 6 0	
Above L.5, and not above 10	0 1 0	0 6 0	0 12 0	
... 10, ...	15 0 1 6	0 9 0	0 18 0	
... 15, ...	20 0 2 0	0 12 0	1 4 0	
... 20, ...	25 0 2 6	0 15 0	1 10 0	
... 25, ...	50 0 5 0	1 10 0	3 0 0	
... 50, ...	75 0 7 6	2 5 0	4 10 0	
... 75, ...	100 0 10 0	3 0 0	6 0 0	
Exceeding L.100, then for every L.50, and for any fractional part of L.50...	0 5 0	1 10 0	3 0 0	

In the case of a lease under thirty years, if the rent be under L.20, and a fine, premium, or grassum be paid, then the duty is to be the same as on a sale; and if the rent be above L.20, both the lease-duty and sale-duty are exigible. In the case of a lease, to which the second and third columns apply, where there is a fine, premium, or grassum, and whatever the amount of rent, both the lease and sale-duty are exigible. See 13th and 14th Vict., c. 97, and 17th and 18th Vict., c. 83.

LEATHER. The skins of various animals, in their fresh state, are flexible, tough, and elastic, and appear to be admirably adapted to the purposes of clothing. But in drying they become hard and horny, and, on exposure to moisture, putrid. The art of restoring the supple qualities to skins, and rendering them durable, appears to have been discovered at an early period of man's history; and the word *leather*, from the Saxon *lih*, *lithe*, or *lither*, indicates the quality of suppleness.

Leather is formed by the chemical union of the *dermis*, *corium*, *cutis*, or true skin of an animal, with an astringent vegetable principle, known as *tannin* or *tannic acid*. The word *tan*, from the French *tanner*, to tan, appears to be derived from the low Latin *tanare*. Leather may, however, be prepared by impregnating the skin with alum, oil, or grease.

In the animal hide or skin, the outer part, which is covered with hair or wool, is called the *epidermis* or *cuticle*, below which is the *reticulated tissue*, and then, in contact with the flesh, is the *dermis*, or true skin, which is the only part which admits of being tanned. It varies in thickness in different parts; the mane, the back, and the rump, being thicker than the belly. The skin is converted into *gelatine*, or *glue*, by the action of boiling water.

Varieties of Leather.—The leather tanned in England is generally divided into three kinds, namely, *hides*, *kips*, and *skins*, and these yield different varieties of leather, such as *butts* and *backs*, which are made of the stoutest and heaviest ox-hides. Fig. 1 will show how the butt is formed by cutting off the cheeks, the shoulder, and a strip of the belly on each side, the skin of the head having been previously removed for the use of the glue-maker. For backs, the cheeks and belly are cut off, but the shoulder remains. Hides are similar to butts with the bellies on, and are made out of cow-

hides, or the lighter ox-hides. When hides are tanned whole for sole leather, they are called *crop hides*. Skins produce the lighter varieties of leather. Large quantities of hides, dry or salted, are imported into the United Kingdom from South America and different parts of Europe, from the Cape of Good Hope, Morocco, &c. Calf skins are imported from the Baltic, and the calves being killed younger than in this country, the leather prepared from them is used for bookbinding, gloves, and ladies' shoes.

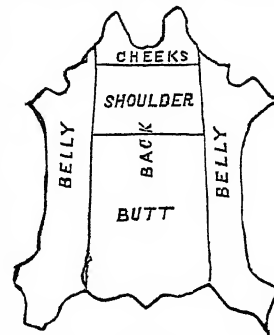


Fig. 1.

The stoutest leather is made from butts or backs. Buff leather was formerly made from the hide of the buffalo, but it is now furnished by cow-hide, and is used chiefly for soldiers' belts. Bull-hide is thicker than cow-hide, while that of the bullock is intermediate. Calf-skin supplies the great demand for the upper part of boots and shoes. Sheepskins form a thin cheap leather; lamb-skins are used for gloves; goat and kid skins form a light leather of fine quality; deer and antelope are usually *shamoyed*, or dressed in oil; horse-hide is prepared for harness-work, &c., and this, with seal-skin, is used for making enamelled leather; dog-skin makes a thin tough leather, but most of the gloves sold as dog-skin are made of lamb-skin. Hog-skin makes a thin porous leather, and is used for covering the seats of saddles. There is a large import trade in skins. The great demand for leather for the best gloves is supplied by lamb-skins from Italy, Spain, the south of France, and other parts, where, in consequence of the lamb being killed earlier than with us, the skin is small, fine, and thin, and is used instead of kid; but it is neither so strong nor so glossy. The skins of lambs that die soon after their birth are sometimes dressed with the wool, and are used for lining gloves and shoes. The best kid-skins are from the south of France: they are also imported from Germany, Switzerland, Italy, and Ireland. It is said that as soon as the kid begins to feed on herbage, the skin suffers in fineness and delicacy, and is no longer suitable for the best gloves. The best morocco leather is made from Swiss goat-skins, another kind is from Mogador and East Indian goat-skins, which are often made into black morocco, known as "Black Spanish leather," from the circumstance of our first supplies having been obtained from Spain. The leather from the Cape sheep-skin is nearly equal to morocco. Hippopotamus hides are imported from South Africa, and when tanned with oak-bark, they make an extremely thick and compact leather.

Tanning Materials.—The vegetable substances used in tanning have of late years become almost as numerous as the varieties of hides and skins on which they are employed. The active vegetable principle tannin varies somewhat according to the source from which it is derived; but it is always marked by an astringent taste, a bluish-black, or dark green precipitate, in aqueous solutions, by admixture with a solution of one of the salts of peroxide of iron; while, with a solution of gelatine, it gives a dirty white or brown precipitate. A cold aqueous solution of tannin, mixed in certain proportions with one of gelatine in the form of glue, size, or isinglass, forms a substance which is known as *tanno-gelatine*, which may be formed by the application of heat into a viscid elastic mass, resembling India-rubber. By the action of ether, containing a little water, on galls, pure tannin may be procured. The ethereal solution separates by repose into two layers, the lower one, which is of an amber colour, being a solution of tannin in water; while the upper layer contains gallic acid, mixed with other substances. On gently evaporating the aqueous solution,

Leather. nearly pure tannin is procured, to the extent of from 35 to 40 per cent., from galls. Obtained in this way, it is a shining, porous, uncrystallizable mass: it is soluble in water, and then exerts the properties of an acid. By exposure to air it absorbs oxygen, and gives off carbonic acid; two new products, gallic acid and ellagic acid, being formed at the expense of the tannin, the latter being insoluble. Tannin may be precipitated from its solutions by sulphuric and some other acids: by boiling the precipitate with sulphuric acid for a few minutes in a dilute solution of the same acid, gallic acid is formed, and crystallizes in cooling. Gallic acid exists in gall-nuts, sumach, valleronea, tea, and other substances, and probably arises from the decomposition of tannin. It does not combine with gelatine, and is, therefore, useless in tanning. Some tanners, however, imagine the gallic acid of the waste liquor to be useful in swelling or raising the hides, preparatory to removing them to a stronger liquor. It is important to the tanner to understand the circumstances under which tannin is converted into gallic acid: they are numerous and somewhat complicated, and their investigation belongs to the scientific chemist, to whom the manufacturer already owes so many obligations.

During a long period the principal tanning material in this country has been oak-bark. That which is stripped in the spring is the most esteemed, for it then contains a larger quantity of tannin than that stripped in autumn, and this more than the bark stripped in winter. The best bark is obtained in a warm spring, from coppice trees about 12 years of age. Oak-bark contains from 5.6 to 6.0 of tannin, which is contained in the inner white layers next the alburnum, as in the case of other astringent barks. The tannin of bark is probably not identical with that of galls, as it does not yield pyro-gallic acid, when subjected to destructive distillation. From 4 to 6 lb. of oak-bark are required for every pound of leather. A load of oak-bark, consisting of 45 cwt., delivered in London, varies from L.15 to L.16, 10s. After the stripping, the bark is stacked to dry. Should the season be rainy a portion of the tannin may be washed out, and the bark be thus deteriorated. There is no doubt that the peculiar excellence of the sole leather of England is due in great measure to the superior oak-bark which we possess. Oak-bark imparts firmness and solidity to leather, while other sorts give softness; thus the peculiar softness of French curried leather is referred to the bark of the evergreen oak, with which the better kinds are tanned, while the other tanning materials next to be named give each its peculiar quality with respect to colour, scent, toughness, or the power of resisting moisture and decay.

The other tanning materials, used chiefly for fancy leathers, are as follows:—Sumach, consisting of the young branches and powder of the leaves of *Rhus Cotinus*, *Venus sumach*, or the wild olive, and *Rhus Coriaria*. Sumach varies in its amount of tannin from 16.4 per cent. in Malaga and Sicilian specimens, to 10 and 5 in Virginia and Carolina sumach. The solution is liable to fermentation. *Divi*, or *divi-divi*, is the pod of a South American shrub, *Cesalpinia Coriaria*. The pod is dark-brown, about 3 inches long, and curled up as if by heat. It is rich in tannin, the whole of which is found in the rind below the epidermis. Valleronea, consisting of the acorn cups of *Quercus Agilops*, or prickly-cupped oak, growing in the Morea. A smaller kind, called *cornata*, containing a larger proportion of tannin, is for the most part used by the silk-dyers. About 2 lb. of valleronea are required for making 1 lb. of leather. Valleronea and oak-bark may be mixed together with good effect. *Catechu*, *cutch*, *Terra japonica*, or *terra*, are the inspissated aqueous extracts of the bark, wood, and leaves of the *Acacia Catechu*, and *Uncaria gambier*. The two varieties are known in commerce as catechu, or gambier, and cutch; that from Bombay is richer in tannin than that from Bengal. *Myrobalan* is a name given to the fruit of several East India trees; the

husk, being the portion valuable to the tanner, is separated by bruising the nut which it incloses. *Mimosa* or *Wattle-bark* is furnished by different species of *Mimosa* growing in Australia and New Zealand. *Cork-tree bark* is the inner bark of the cork oak, the outer or dead bark being the well-known substance, cork. It is obtained from Corsica, Spain, and a few other countries, and contains twice as much tannin as average oak-bark. *Larch-bark* is sometimes used for tanning sheep-skins, and *Willow-bark* for kid and lamb skins. The last named bark is used in making Russia leather, but its peculiar odour is given by means of the oil of birch-tree bark.

In addition to the tannin contained in the above substances, there are mucilaginous, colouring, and other matters which have an influence on the kind of leather produced. The tannin itself may also vary in different materials; thus, catechu and divi give a more porous leather than oak-bark or valleronea, while larch-bark gives a very inferior leather to that prepared from oak-bark. The colouring matter in some excellent tanning materials prevents their use, since it is the custom to sell both upper and sole leathers of a yellowish-fawn colour, and anything which interfered with the production of this tint would be objected to; thus, catechu and cutch would be among the cheapest of tanning materials, were it not that they impart to the leather a reddish-brown colour, which would in no way interfere with the dressing or currying.

The tanner frequently judges of the strength of his infusions of bark, technically called *ooze*, by means of a kind of hydrometer called a *barkometer*. It is graduated to the standard of pure water, and when placed in a specimen of *ooze*, the strength of the latter is judged of by the position of the stem above or below the water-mark. But as a bark or other tanning material may contain several soluble substances besides tannin, the barkometer obviously cannot be relied on.

Some tanners judge of the strength of *ooze* by the taste, the amount of astringency determining the strength. The usual test for tannin is a solution of glue or isinglass, which being mixed with a known weight of a solution of tanning material, a precipitate of tanno-gelatine is produced which is filtered, dried, and weighed: the proportion of tannin is thus ascertained. As, however, some kinds of tannin produce larger precipitates of gelatine than other kinds, and as the composition of tanno-gelatine varies with the strength both of the solution of gelatine and of tannin, this method is not reliable. Sulphate of quinine is said to afford a better test; a solution thereof, acidulated with a few drops of sulphuric acid, will, it is said, precipitate tannin completely from the solution. A good method of testing the value of tanning material is to digest a piece of dry prepared hide or skin in a known quantity of the infusion, until the whole of the tannin and other matters be separated. The skin is then taken out, slightly washed, dried, and weighed, when the increase of weight is supposed to be the weight of tannin and of the other matters required.

Tanning of Thick Leather.—The first operation to which the hides and skins are subjected is *depilation*, which removes not only the hair, but also the scarf-skin. This is effected variously in different countries. In England the most common plan is to throw the hide or skin into a strong watery ley of slaked lime, with lime in excess. Here, in a few days, more or less according to the proportion of lime present, the hair is easily detached, the hair-sheath having been dissolved; the scarf-skin with the hair are then scraped off upon a sloping rest, with a species of knife with two handles. The lime has also combined with the fat of the hide to form a calcareous soap, to dissolve which, and the excess of lime, it is well washed, sometimes in a running stream. The hide is fleshed, or deprived of the loose or extraneous flesh or cellular tissue; and if butts are to be made, the head, shoulder, and bellies are cut off, as

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Leather. already noticed. The central part, or butt, weighs about two-thirds of the whole leather. The hair was formerly taken off by making a sour liquor from fermented vegetable matter, in which the hide lay for several days; they were also smoked in a damp state for the same purpose; but both those methods are now abandoned. They are still sometimes sweated, that is, they are laid in heaps, and kept wet and warm; but in America the sweating is performed cold; the hides are hung up wet in a damp underground cellar, and are kept moist for ten days or a fortnight, a plan which is still adopted in this country for skins. In either of the three last processes, incipient putrefaction takes place sooner or later, when the hair and scarf-skin are easily removed; but the fatty matter remains, and in some cases prevents the hide from taking the tan. The tanning either follows at once, or is preceded by what is called *abating* or *grainering*. For this process, a quantity of pigeon's dung is dissolved in water. In this mixture the hides are steeped for a week or ten days, with occasional removals and striking. The theory of this process is obscure; but it has been explained on the supposition that the uric acid of the dung removes the excess of lime, and that the ammonia generated by the putrefaction of the mixture tends to form an ammoniacal soap with any remaining fat of the hide; but as the gelatine of the hide exists in two states,—one, the principal, hard, or fibrous portion, and the other (which is more soluble) contained between the fibres, and more affected by agents and putrefaction—this softer portion is removed by grainering, and the leather, when tanned, is light and porous, and more readily permeable to water.

Some tanners are anxious that their leather should look thick when completed. To "raise" the hide, they use a solution of sulphuric acid, containing $\frac{1}{10}$ th part of acid; in this the hides remain ten or twelve hours, when they are found to be thickened, or to have substance; but as nothing is added to the gelatine by the process, it is only the appearance which is altered, and no difference of thickness is found in the leather after it has been under the shoemaker's hammer.

The hide or skin thus prepared is ready for tanning. It was formerly the practice in England, as it now is on the Continent, to tan by the process of *stratification*, for which purpose a bed of bark is made upon the bottom of the pit; upon this is laid the hide, then bark, then a hide, and so on, until the pit is full; water is sometimes pumped in, and the pit left for some months; it is then emptied, and the same hides returned with fresh bark and water for a few months longer; this is repeated again and again, until the tanning is completed; the time varying from one to four years for heavy leather.

About the end of the eighteenth century, Seguin professed to give a theory of tanning. He showed that astringent solutions contained gallic acid, which precipitated sulphate of iron black, but did not precipitate gelatine; whereas the tannin present threw down gelatine as well as sulphate of iron; and from this he deduced that leather was a compound of gelatine and tannin. Upon this he founded a new process. He recommended that the hides should be subjected to the action of solutions of tannin, made by pumping water successively upon the vegetable used, contained in *latches* or *spenders*, until it arrived at as great a degree of strength as the series of spenders permitted. In this way he was continually throwing away some bark as expended, and replacing it with fresh, which was next to be the strongest tap.

This is the plan generally followed in England; but in practice it is varied, some using ground bark only, others *Terra japonica*, vallonea, or divi-divi, or mixtures of two or more; some using steam to facilitate the solution, others steaming only the backward latches; and some using only cold water. In some yards clean water only is used to extract the soluble matter, while in others the ooze, exhausted as much as it can be by the hides, is made to per-

form the office instead of water. Every tanner has also his own particular strength of liquor to work at, the strongest being about sixty degrees, while others do not go beyond ten degrees. It is these variations which cause so great a variety among the samples of leather in the market.

This improvement of Seguin was of importance in shortening the period of tanning to about half of that previously occupied. The principal difficulty experienced in its use occurs in the estimation of the real quantity of tanning material actually in solution. He proposed the use of a solution of gelatine, isinglass, or glue, which was to be dropped into the fluid as a test of the presence of the tannin. In the hands of an experienced chemist this is a tolerable means of arriving at the quantity; but it proved too difficult for the tanner of the day. He therefore judges by the astringent taste of the solution, and its darkness of colour; or depends upon its strength from a certain weight of bark, &c., which may have been used. The use of the barkometer has been already referred to.

In trying the quantity of tannin by Seguin's process, that is, by precipitating it with the solution of gelatine, 480 grains of the bark in coarse powder should be acted on by half a pint of boiling water. The mixture should be frequently stirred, and suffered to stand twenty-four hours; the fluid should then be strained through a linen cloth, and mixed with an equal quantity of solution of gelatine, made by dissolving glue, jelly, or isinglass, in hot water, in the proportion of a dram of glue or isinglass, or six table-spoonfuls of jelly, to a pint of water. The precipitate should be collected by passing the mixture of the solution and infusion through folds of blotting-paper, and the paper exposed to the air till its contents are quite dry. Every 100 grains of precipitate contains 40 grains of tannin nearly.

When the hide or butt has been brought from the beam-yard, it is introduced into a poor and milky liquor, in which it is *handled* for four or five days; that is, it is lifted by hooks from the pit, laid with other hides in a heap on the side, where it is allowed to drain, and is then returned into the pit. The lime is intended to be taken out here by the gallic and acetic acids of the poor ooze, as it is found in practice that the presence of lime tends to darken the colour of the future leather, an effect produced by all alkalies and alkaline earths. The hide is next successively handled into and out of all the handlers, increasing in strength; and in this way at length, having after some months got to the strongest handler, it is found to be stained through, though not tanned, when it is removed to the pits which contain still stronger liquors; these it successively passes through, being handled at longer intervals. Upon arriving at the end of this series, the hides are laid away in a pit called a *layer*, where they are interstratified with powdered bark or vallonea; the pit is then filled up with very strong ooze. When the process is deemed complete, each hide, on being taken out, will be found to be converted into leather; and a portion of its gelatine which has been dissolved from its interior is, by combination with a portion of tannin from the strong solution, deposited upon its surfaces, where it is found in the form of a yellow deposit, technically known as *bloom*, or *pitching*, which disguises the under colour of the leather, just as if it were covered with yellow paint. This, prejudice says, must be on its surface, or it is not saleable; but it is so much quality and weight lost to the consumer, as he pays for it on the outside of his leather, to be scraped off by the shoemaker in the operation of buffing; and the leather is so much the worse, as, if it had remained incorporated with the leather, this would not have been so porous, or so permeable to water. The health of the wearer of the shoe is perhaps sacrificed by wet feet, occasioned by the desire of his shoemaker to see a yellow paste on his leather, which in work he scrapes off with a piece of glass.

Leather.

Leather.

The theory of the formation of the bloom is this. As soon as ooze has penetrated into a hide, it loses its tanning material, but by capillary attraction is detained; this exhausted ooze acts by maceration on the finer and more soluble interstitial gelatine, and dissolves it. In handling, about one-twelfth of this flows out; the remaining eleven-twelfths accompany the hide into the next stronger solution, of which only one-twelfth is absorbed directly, and a small portion is slowly exchanged by endosmosis and exosmosis. The small portion of strong solution which passes into the pores of the hide contributes to tan the hard fibrous portions not dissolved; and the small portion of weak solution passing out of the hide by exosmosis, gives up its dissolved gelatine to the tan of the stronger solution outside, to form tannate of gelatine, which partly adheres to the surface as bloom, and partly falls to the bottom of the pit as pitching. It is to be hoped that such an exposition will tend to lead to the adoption of some system of tanning in which the exhausted ooze may be so quickly removed by pressure as not to allow it to dissolve the finer and better portions of the skin. Some years since, Mr Spilsbury endeavoured to introduce a new principle in tanning, by which some part of this action should be prevented, by bringing strong ooze at once into contact with the inside of the hide. He obtained a patent for a plan of tanning by infiltration. He fastened two hides in clamps, so that the frame represented four sides of a box, and the two hides two sides. By filling this box with strong tanning ooze, and forcing it through the pores of the hides by the pressure of a column of the fluid, he expected to tan them promptly and well; but he was not aware that a large excess of tannin dissolves gelatine, and thus tannate of gelatine was found on the outside of his box in long masses of slime, while the leather had lost as much in weight, was porous, and was tanned very much more in the thin than the thicker parts, as the fluid always passed through the easiest channel. Many other inconveniences attending the process caused it to be abandoned; but the erroneous principle upon which it was founded not having been made public, three other patentees followed in the same track. Mr Drake of Bedminster sewed hides together, so as to form a bag, which he placed inside a hollow frame-work of wood to support the bag, and then filled it with ooze. Mr William Cox of Bedminster sewed up a hide in the same position as it was on the animal's back, laced a canvas support round, and then filled it with ooze; and Mr Chaplin sewed his hide into a bag, filled it with ooze, but laid it in a reclining position, turning it periodically.

Seguin's process of tanning by solutions, although a great improvement upon the old method, is still tedious and expensive. Where warm oozes are used, it requires six or seven months for sole-leather; where cold oozes are in use, it extends to twelve months; consequently the tanner can turn his money only once a year: he must have capital enough to pay for twelve months' hides, bark, &c., labour, and contingent expenses, besides keeping a stock of leather; and when his capital has been turned at the end of twelve or more months, it must pay him, in one single profit, the interest, &c., of twelve months. This has confined the trade to a few wealthy individuals, who look upon tanning as an investment for capital rather than as a business which might be improved by science. Hence tanning has been more stationary than any other manufacture, and the few improvements which have been made in it have not been made by tanners. Another patent has occupied considerable attention. It is founded upon the principle adopted in washing a sponge. The old tanner takes his sponge (the hide) full, or nearly so, out of one ooze, and inserts it nearly full into the next. The patentees of the roller and belt system squeeze, by a simple and self-feeding press, their hide, before they drop it into the fresh ooze; and this

simple modification would seem to promise well for the improvement of the art of tanning. Messrs Herapath and Cox of Bristol, the patentees, say that, to tan 100 butts per week, they erect in a tanyard, capable of tanning 50 per week, six or eight large pairs of rollers, one pair over each pit. The lower roller is 30 inches in diameter, and is covered with horse-hair cloth; the top one 18 inches, with levers for weights, covered with woollen cloth. For each pair of rollers there are from 50 to 100 hides, connected together head to head and tail to tail, each by about four strings. Now the first butt or hide is inserted between the rollers loaded to the proper pressure; and upon turning the bottom roller (which requires very little force, as it is a slow motion), all parts of the butt are pressed as they are pulled through by the rollers; the next comes in order by the assistance of the strings; and so on, until the whole of the hides in the belt have been pressed, and deposited in the fluid on the other side of the pit. By a detent the motion is now reversed, when the belt is again pressed, and returned to its original position for a fresh supply of ooze

(see fig. 2). This simple plan brings strong ooze so frequently into the interstices of the hide, that the centre of a stout butt is not only stained through, but tanned, in between one and two months; calf-skins and kips are tanned in from twenty to thirty days; and the liquors are so rapidly exhausted,

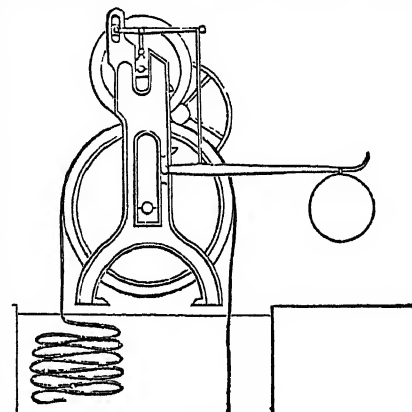


Fig. 2.

that they are reduced from 45° to nothing in thirty-six days, losing at first more than 2° per day; and the shortness of this exposure to the air prevents much of the tannin from being decomposed. It was stated at the time when this patent was taken out, that at Nailsea, near Bristol, 100 butts per week were tanned, with six latches, six rolling pits, twenty-four handlers for the offal, and six layers; one horse-power driving the rollers, and two boys managing them. The following were given to us as the results produced in the first yard which was put entirely on the patent plan, as compared with those of the same yard on the old plan:—Double the work was done, and half the capital drawn out as useless. The saving on bark, labour, and general cost of manufacture was 1½d. per lb. The increase in the weight of butt leather was as 34 lb. to 28 lb.; 46½ lb. of leather being produced from a 60 lb. wet salted hide. The butts were sent to market within four months from the time the hides were delivered to the yard. The profits from quick return, great weight, and small expense, were eight times as great as on the old plan, at similar prices of hides, bark, and leather. The leather was also said to be more elastic, and more impervious to wet, than any other that is made. Notwithstanding all these brilliant results, the plan seems to have failed. An extended experience with the new method seemed to prove that the leather was more brittle, and in other respects inferior to that produced by the old method, which still continues in operation at most tanneries.

We must notice Bordier's method of making leather by means of metallic or earthy substances. The hides are washed, unhaired, and swelled as before, when they are immersed in a solution of sub-sulphate of peroxide of iron, or sulphuric acid, with excess of the peroxide. The solution

Leather.

Leather. may be prepared as follows:—2 cwt. of bruised sulphate of iron are dissolved in 15 gallons of boiling water, in a copper boiler. The solution is run off into a shallow vessel of the capacity of 4½ gallons, then 44 lb. of sulphuric acid, sp. gr. 1·848, are stirred in, together with 4½ lb. of black oxide of manganese in powder; but the latter must be added gradually, the whole being stirred up so long as gas is disengaged, and afterwards, at intervals, until the solution is cold. It may then be diluted with water to the required strength. By digesting hides and skins in this liquor, they become impregnated with an insoluble sub-sulphate of peroxide of iron, while there remains in the liquor free sulphuric acid, sulphate of manganese, and a small quantity of proto-sulphate of iron. It is stated that hides in the course of six or eight days, and skins in three or four days, become converted into leather, which is as impurescent and as impermeable to water, as leather tanned in the usual manner.

Splitting.—In the preparation of certain kinds of leather, the hides, after immersion in a weak ooze for from ten to fourteen days, are split into two portions, after which the halves are tanned separately. The upper, or grain half, is used for covering carriages, and the flesh half for enamelling. The principle of the machine used in the splitting will be understood by referring to fig. 3, in which D represents a

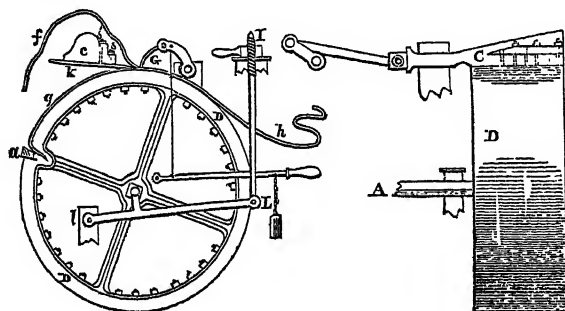


Fig. 3.

mahogany drum, 4 feet in diameter, and about 6 feet in length: the tail end of the hide or skin is fixed into a slot in the drum at *a*, by means of wooden wedges; *k* is a steel knife of the length of the cylinder, attached by means of screws *s, s'* to the bottom of a cast-iron carriage *C, c*. Rapid motion is given to the carriage by means of a crank, by which the knife is made to vibrate rapidly backwards and forwards in a plane parallel to the axis *A* of the drum. The hide *h* is kept flat to the cylinder by means of a thin plate of steel *B*, called a governor, placed in front of the knife, and, being pressed down by a weighted lever, smooths out the wrinkles. As the hide *h* is thus cut, one-half *f*, which is the split flesh side, passes over the knife, while the other half, consisting of the split grain side *g*, adheres to the drum. The thickness of the split may be regulated by means of a screw *I* at each end of the drum, which screw, acting upon a lever *LL*, raises or depresses the axis of the cylinder, and thus diminishes or increases the thickness of the split grain side of the hide.

Currying.—The skin of leather as it leaves the tanyard, is a comparatively rough article, and requires the manipulations of the currier in order to fit it for the shoemaker, the coach-maker, the harness-maker, and other numerous trades in which leather is employed. Let us suppose that a tanned calf-skin is to be prepared for use. It is first made pliable by soaking in water, after which it is shaved on the flesh side, whereby the loose rough portions are removed, and a tolerably smooth surface is produced. This operation is carried on at a beam or strong frame of wood, supporting a stout plank faced with lignum vitæ, and set vertically, or nearly so. The knife (fig. 4) is a double-edged rectangular blade, about 12 inches by 5 inches, with

a straight handle at one end, and a cross handle at the other, in the plane of the blade. The edges of this knife are first made very keen, and are then turned over so as to form a wire edge by means of the thicker of the two straight steel tools shown in fig. 5, which wire edge is preserved by drawing the thinner steel tool along the interior angle of the wire edge from time to time

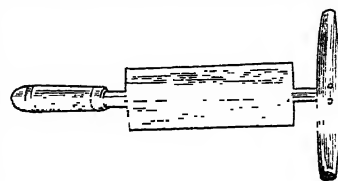


Fig. 4.

as required, for which purpose the man holds this smaller tool between his fingers, together with the beam-knife. The skin being thrown over the plank, the man presses his body against it, and leaning over the top, holds the knife by its two handles, almost perpendicularly to the leather, and proceeds to shave it; shifting it from time to time, so as to bring all the parts under the action of the knife, and frequently passing a fold between his fingers to test the progress of his work. The skin is then placed in cold water, and removed to a mahogany or stone table, to which the wet flesh side adheres, and is worked with a tool called a stretching-iron, or slicker *S* (fig. 5), consisting of a flat rectangular piece of iron, copper, or smooth hard stone, fixed in a handle. With this tool, a man scrapes the surface of the skin, exerting a strong pressure with both hands, and dashing water upon it from time to time, by which means lumps and inequalities are made to disappear, the leather is equalized and extended, and the bloom is brought to the surface. The superfluous moisture is now *slicked* out, and a stuffing or *dubbing* of cod-oil and tallow is rubbed into both sides of the skin, but chiefly the flesh side, by means of a brush, or with the woolly side of a piece of sheep-skin. The skin is now dried in a loft, and as the water only evaporates, the dubbing sinks into the pores. A stove heat is sometimes employed for the purpose, and the neighbourhood is unpleasantly reminded of the fact, by the currier using shavings of leather as fuel. When dry enough for the purpose, the skin is *boarded*, or worked with a graining board or pommel *C* (fig. 5), the effect of which is to bring up the *grain*, or give a granular appearance to the leather, and

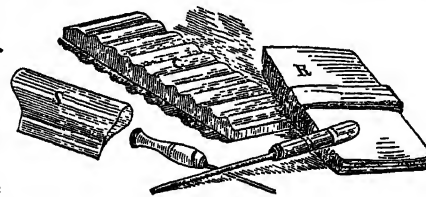


Fig. 5.

also to make it supple. The pommel is a piece of hard wood, grooved like a crimping-board, and attached to the hand by means of a strap, whence the word pommel, from the French *paumelle*, or palm of the hand. The leather passes through various manipulations, each having its distinct name; thus *graining* consists in folding the skin with the grain sides in contact, and rubbing strongly on the flesh side; *bruising*, or rubbing the extended skin on the grain side; *whitening*, or passing a knife with a very fine edge over the skin at the beam, so as to clean the flesh side, preparatory to *waxing*, which is done just before the skins are sold; for at this point the currier stores his skins, as they can be kept best in the state of *finished russet*, as it is called previous to waxing. Waxing consists of two parts: the first is the laying on the *colour*, or blacking of oil, lamp-black, and tallow, which is well rubbed in on the flesh side with a hard brush; secondly, the skin is black-sized with stiff size and tallow, laid on with a sponge or a soft brush, and thoroughly rubbed with a glass *slicker*, a finishing gloss being given with a little thin size. The curried skin is now said to be *black on the flesh*, or *waxed*, in which state it is used for the upper leathers of mens' boots and shoes. The

Leather.

Leather. leather which is curried on the hair or grain side, is called *black on the grain*, and is mostly used for the upper leathers of ladies' shoes. In preparing such leather, the waxing is performed as follows:—A solution of sulphate of iron, called *copperas-water*, or *iron-liquor*, is applied to the grain side of the wet skin, when the salt, uniting with the gallic acid of the tan, produces an ink dye; stale urine is then applied to the skin, and when dry, the stuffing is applied. The grain is raised, and when dry the skin is whitened, bruised, and again grained; after which a mixture of oil and tallow applied to the grain side, completes the process.

Varnished and Enamelled Leather.—For many years it was found difficult to cause a bright varnish to adhere to leather without cracking, an effect which is now produced by means of boiled linseed oil, mixed with vegetable black and Prussian blue. This composition, of the consistence of a thick paste, is rubbed upon the surface of the leather, and then dried at a temperature of from 150° to 170° Fahr. The process is repeated from three to seven times, and when quite dry, the varnish adheres very firmly, and will bear considerable flexure and tension without cracking. By mixing coloured pigments with the varnish, enamelled leather of various colours may be produced.

Thin Leather.—The process of tanning differs considerably in the mode of treatment with the kind of skin and the result desired. A large number of thin leathers which are intended to be dyed, are tanned in various ways. White leathers are not tanned but tawed, or treated with alum, salt, and some other matters. Wash leather is dressed with oil, or shamoyed. But whatever may be the subsequent treatment, the preparatory steps somewhat resemble each other, whereby hair, wool, grease, and other matters, are removed, and the skin is reduced to the state of a gelatinous membrane called *pelt*. The hair is removed from kid and goat skins, by means of cream of lime; the wool is generally removed by the fell-mongers before the skin is passed to the tawers. Foreign lamb-skins, which are received with the wool on, are washed, scraped on the flesh side, and sweated in a close room, until, in consequence of the putrefactive fermentation, the wool can be easily removed. After this, fatty matters are got rid of by subjecting the skins to hydrostatic pressure; they are next worked at the beam, and pared into shape, treated with lime, and next with dogs' or pigeons' dung if the skins are to be tanned, and with bran and water if they are to be tawed, the object being in either case to get rid of the lime. During these operations the skins are worked a few times at the beam, and are finished by washing in clean water.

Morocco leather is prepared by tanning goat-skins with sumach, and dying on the grain side. Inferior moroccos are prepared from sheep-skins similarly treated, for which purpose each skin of pelt is sewed up into a bag, the grain side outermost, distended with air, and placed in a mordant of tin or alum. They are next placed in a warm cochineal bath for red, indigo for blue, orchil for purple, and are worked by hand until the dye has properly struck. For certain colours the tanning precedes the dyeing. The tanning or sumaching is carried on in a large tub, containing a weak solution of sumach in warm water; another and stronger solution is contained in an adjoining vessel, a portion of which, together with some sumach leaves, is poured into the bag; some of the weak solution is then added, the bag is then distended with air, and the skin thrown into the vat. In this way about fifty skins are treated, and are kept in motion a few hours in the sumach tub by means of paddles worked by hand or by machinery. The skins are then taken out and heaped up on a shelf at the side of the tub, the pressure thus produced causing the liquor to escape slowly through the pores of the skin, the bags being shifted about from time to time. The bags are next passed into a second vat containing a stronger solution, where they re-

main for nine hours. The bags are now opened and washed; fine red skins being finished in a bath of saffron. All the skins are next *struck* on a sloping board until they are smooth and flat, and in order to improve their appearance in the currying a little linseed oil may be rubbed on the grain side. They are then hung up in a loft to dry, when they become horny, and are *in the crust*, as it is called. They next pass through much laborious friction with the pommel, and with a glass-ball; while the peculiar ribbed appearance of morocco is given by means of a ball of box-wood, on which is a number of narrow ridges. Sheep-skin morocco is prepared from split skins; the skin-splitting machine resembles in principle that already described, only as the membrane is thinner certain variations are required. Instead of stretching the skin on a drum, it is passed between two rollers, the lower one of gun metal and solid, and the upper made of gun-metal rings; while between the two rollers, and nearly in contact, is the edge of the sharp knife, which is moved by a crank, as already mentioned. When a skin is introduced between the two rollers, it is dragged through against the knife edge and divided, the solid lower roller supporting the membrane, while the upper one, being capable of moving through a small space by means of its rings, adjusts itself to inequalities in the membrane; where this is thin the rings become depressed, and where it is thick they rise up, so that no part escapes the action of the knife. The divided skins are not sewed up into bags, as from their thinness they can be sumached quickly.

In preparing white leather by tawing, the pelt is made as pure as possible; the best kid leather being prepared from kid skins, while sheep or lamb skins make the inferior kinds. They are first fed with alum and salt in a drum or tumbler made like a huge churn; about 3 lb. of alum, and 4 lb. of salt being used to 120 skins of medium size. The alumina of the alum probably forms some definite compound with the gelatine of the skins, while the salt serves to whiten them. When taken out the skins are washed in water, then allowed to ferment in bran and water, to remove the surplus alum and salt, and to reduce the thickness. They are next dried in a loft, and become tough and brittle, but they are made soft and glossy by means of a dressing of 20 lb. of wheat flour, and the yolks of eight dozen eggs. By rotating the skins in the drums for some time the dressing is absorbed, and scarcely anything but water remains. This dressing is usually repeated, and the skins are hung up to dry. The beautiful softness and elasticity of this leather is now given by manipulation. The skins are first dipped in clean water, worked upon a board, and staked upon a stretching, or softening iron, consisting of a rounded iron plate fixed to the top of an upright beam, by which the skins become extended and made smooth. They are finished by being passed over a hot iron.

When a skin, properly cleaned and soaked in water, has oil or grease forcibly rubbed into its pores, the oily matter combines with the fibres, and renders the skin permanently soft. Water only evaporates during the drying, and the result is a kind of leather called *chamois*, *shammy*, or *shamoyed*, from the fact that the skin of the *chamois* appears to have been the first treated in this manner. When such leather is dyed, it will bear washing, and hence it is also called *wash-leather*. The best leather of this kind in Great Britain is prepared from doe or sheep skin, while for inferior kinds the flesh side of a split sheep-skin is used, the grain side being tawed for *shiver*, such as is used for hat-linings, &c. Where the whole skin is employed, the grain is removed by *frizing* or scraping with pumice-stone or with a round knife. The skins are now placed in bran liquor, wrung out, spread upon a table, sprinkled with a small quantity of oil, rolled up into balls, four skins to the ball, and beaten with wooden hammers in fulling stocks. After two or three hours' beating they are

Leather.

Lebadea
||
Lecce.

taken out, exposed to the air, again oiled and beaten, which operations are repeated several times. After this the skins are hung up in a warm room, where they undergo a kind of fermentation which promotes the union of the oil with the fibre. They are next scraped with a blunt concave iron, scoured in weak lye to get rid of superfluous oil, washed in water, dried, smoothed, and made supple by means of the stretcher-iron or rollers.

By a variation of the processes of shamoying and tawing, a stout leather, well adapted for driving-bands for machinery, has been produced by Preller's process. The hides and skins being unhaird, &c., are smeared with a paste consisting of starch, oil or fatty substances, salt, and saltpetre, and are then agitated in a drum. After two or three smearings and agitations and drying, the process is complete. In a leather thus formed the fibre of the skin is preserved, and an increased toughness consequently gained.

Recent Improvements in Tanning.—The tanner has not of late years shared in the benefits which the rapid advance of chemistry has conferred on other arts. Mechanical improvements, however, have been introduced, such as the splitting-machine already referred to: the steam-engine is also generally used, and is applied in various ways for grinding bark, for softening foreign hides, and for giving motion to machines for washing, glazing, and finishing leather. The hydrostatic press is also in use for expressing the grease from sheep-skins, the effect of which is to allow the skin to take a more brilliant dye. The abolition of excise duties, improved

means of transport, and more liberal commercial relations with other countries, have all tended to the improvement of the leather trade.

Statistics.—The quantities of untanned hides imported into the United Kingdom during the years 1853, 1854, and 1855, were respectively, 231,761, 184,024, and 188,844 cwts. of dry hides; and 518,548, 417,175, and 426,933 cwts. of wet hides: while during the same years there were imported of hides tanned, tawed, curried, or dressed (except Russia hides), 7,286,602, 4,180,315, and 4,368,111 lb. Of leather manufactures, the principal article of import is gloves, which, during the three years above named, amounted to 3,476,341, 3,781,624, and 3,612,639 pairs. The next considerable article of import is boot-fronts, of which, in the year 1855, there were imported 538,604 pairs. Of men's boots and shoes there were only 33,115 pairs; of women's boots and goloshes, 26,975 pairs; of women's shoes of silk, satin, stuff, or leather, 111,054 pairs. During the three years above named, there were exported from the United Kingdom, of untanned hides, dry, 70,295, 94,562, and 123,309 cwts.; of wet hides, 15,521, 17,369, and 38,405 cwts.; while of tanned, tawed, curried, or dressed hides, the quantities were respectively, 29,746, 135,241, 338,422 lb. Of foreign leather manufactures, the only article of export is gloves, of which the number of pairs were respectively, 327,645, 390,987, and 217,458. During the three years above mentioned, the exports of British produce, in leather, were as follows:—

Lecco
||
Lectoure.

DESCRIPTION.	Quantities.			Declared Value.		
	1853.	1854.	1855.	1853.	1854.	1855.
Leather, unwrought	23,740 cwt.	29,601 cwt.	31,034 cwt.	L.195,525	L.250,370	L.256,678
Wrought, viz., gloves	31,214 lb.	34,102 lb.	28,420 lb.	25,250	28,312	21,151
Of other sorts	5,404,402 lb.	4,841,987 lb.	3,462,765 lb.	1,057,716	896,077	637,348
Saddlery and harness .....	...	...	...	300,104	329,614	226,662

The gross receipts of customs' duties on leather manufactures imported into the United Kingdom during the years 1853, 1854, and 1855 were respectively, L.58,427, L.61,497, and L.59,984. (C. T.)

LEBADEA, or LEBADEIA (modern *Livadhia*), a town of Bœotia, near the frontiers of Phocis, between Chæronea and Mount Helicon. It is famous as the seat of the oracle of Trophonius; and in the time of Pausanias it seems to have been the most prosperous city of Bœotia. The town was twice plundered by Lysander; and by Archelaus, the general of Mithridates.

LEBRIJA (the ancient *Nebriſsa*), a town of Spain, province of Sevilla, near the left bank of the Guadalquivir, and 29 miles S. by W. of Sevilla. Being situate in an extensive and marshy plain, the town is unhealthy, especially in summer. The manufactures are cloth, sackings, glass, earthenware, soap, bricks, tiles, &c. It has remains of an old castle of considerable extent. The parish church, built of the materials of an old mosque, is a mixture of the Arabic, Roman, and Gothic styles. Pop. 6300.

LECCE (the ancient *Lupia*), a town of Naples, province of Terra di Otranto, on the road from Brindisi to Otranto, about 22 miles distant from each, and 8 miles from the Adriatic. It is fortified by walls, ditches, and towers, and is farther defended by a castle or citadel. The space occupied by the town, it is said, would accommodate double the present population, and hence it has a rather deserted appearance. It is, however, one of the best built towns in the kingdom, having wide and regular streets, and many handsome buildings. The cathedral of St. Oronzio has a wooden roof richly carved and gilt. Lecce is the see of a bishop, and contains a royal college. It has manufactures of woollen, cotton, and silk goods, lace, and snuff; and

carries on an active trade in the products of the surrounding country,—silk, wool, flax, cotton, oil, wine, gum, &c. *Lupia* was an ancient Salentine city, said to have been founded by Malennius, a Salentine king. It is seldom mentioned as a Roman town, though it seems to have been a municipal town of some importance. Augustus remained there for some days on his return to Italy, after hearing of the death of Cæsar. No ancient remains are now visible, but they are said to have been numerous in the fifteenth century. Pop. about 16,000.

LECCO, a market-town of Austrian Italy, province of Como, on the Lago di Lecco, the S.E. branch of the Lago di Como, 17 miles E. by N. of Como. It contains about 5000 inhabitants, chiefly engaged in the manufacture of iron and copper ware, silk, cotton, and woollen stuffs; in which articles it carries on a considerable trade.

LECTISTERNIUM, a sacrificial ceremony observed by the Greeks and Romans on occasions of extraordinary solemnity, when the statues of the gods were placed in a reclining posture on couches, and a feast was spread on tables before them. This ceremony, according to Livy, was first observed in the year of Rome 354, on account of a destructive murrain among cattle. At first a distinction was made between the gods and goddesses, as at the *Epylum Jovis* held in the capitol, where the statue of Jupiter was laid in a reclining attitude, while those of Minerva and Juno were set on chairs. Afterwards this distinction seems to have been neglected, as may be inferred from a representation on the carved handle of a Roman lamp engraved by Bartoli.

LECTOURE (the ancient *Lactora*), a town of France, capital of a cognominal arrondissement in the department of Gers, stands on the summit of a steep isolated rock, near

Lecture
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Lee.

the right bank of the Gers, 20 miles N. of Auch. The main street is wide, regular, and well built, but the others are irregular, dirty, and old-fashioned. The chief buildings are,—a handsome Gothic church, built by the English, an hospital, which occupies the site of the ancient castle, and the old episcopal palace, now the town-hall. Lectoure carries on a considerable trade in cattle, wine, brandy, and agricultural produce, and has some manufactures of coarse woollens, serge, and leather. It was long possessed by the Counts of Armagnac, the last of whom having revolted against Louis XI., was besieged in the town, and surrendered conditionally. The count, however, was faithlessly murdered, and the inhabitants massacred. Pop. (1851) 6030.

LECTURE, a name given to any discourse *read* by a professor to his pupils, but often applied to every kind of *viva voce* instruction. See UNIVERSITIES.

LEDA. See DIOSCURI.

LEDBURY, a market-town of England, county of Hereford, on a declivity near the Malvern Hills, 15 miles E. of Hereford. It consists, for the most part, of two streets, which cross each other. It contains an old parish church of Norman style, an hospital for the aged, founded 1232, and several chapels and schools. The manufactures are unimportant, consisting chiefly of ropes and sacking. A brisk trade, however, is carried on in hops, cider, perry, and limestone, the products of the neighbourhood. The Gloucester and Hereford Canal passes the town. Pop. (1851) 3027.

LEE, NATHANIEL, a dramatic poet, was the son of a clergyman, and born about the end of the seventeenth century. He was educated at Westminster School, and afterwards at Trinity College, Cambridge. After quitting the university, and remaining for some time an unsuccessful dangler about court, he began to write for the stage, and between 1675 and 1681 produced a new play every year. Poverty and a wild imagination, however, overturned his reason, and he was confined in Bedlam for four years. In 1688 he resumed his pen, and, though subject to recurring fits of insanity, he completed two plays between that period and his death, which happened in 1690, as Cibber says, during a night frolic in the street. In the latter part of his life he was dependent upon charity. Of his eleven tragedies, *Theodosius*, *Alexander the Great*, and *Lucius Junius Brutus* have alone taken a respectable position on the stage. His genius for tragedy, commended highly by Addison and other contemporary writers, is completely overborne by the wildness of his imagination, which often leads him into extravagant metaphor and turgid bombast. These faults, however, are partially redeemed by a graceful eloquence and true tenderness in describing the softer feelings of nature. Lee was an imitator of Dryden, whom he assisted in writing *Ædipus* and the *Duke of Guise*.

LEE, Rev. Samuel, D.D., Regius Professor of Hebrew at Cambridge, was born at Longnor, in Shropshire, 14th May 1783, and was educated at a charity school in that village. Apprenticed to a carpenter at the age of twelve, he began early to display that power of application which characterized him all through life, and at the age of seventeen, he commenced to study Latin, purchasing books with his scanty savings. To an intimate acquaintance with this language, the knowledge of Greek, Hebrew, Chaldaic, and Syriac, was soon afterwards added. In 1810 Archdeacon Corbett, hearing of his wonderful acquirements, obtained for him the mastership of Bowdler's foundation school in Shrewsbury. He entered Queen's College, Cambridge, in 1813, and took the degree of B.A. in 1817. In 1819 he became Professor of Arabic at Cambridge, and in 1825, Rector of Bilton with Harrowgate. He received the degree of B.D. in 1827, and became Regius Professor of Hebrew in 1831. Two years afterwards the degree of D.D., which he had

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obtained in 1822 from the University of Halle, was again conferred upon him by his *alma mater*. He died in 1852.

His principal works are the following:—*Events and Times of Visions of Daniel and St John*, 8vo, London, 1851; *Hebrew Grammar*, 1830; *Hebrew, Chaldee, and English Lexicon*, 1840; *An Inquiry into the Nature, Progress, and End of Prophecy*, 8vo, Cambridge, 1849; *The Book of Job, translated from the original Hebrew*, 1837.

LEECHES. See HELMINTHOLOGY; Fam. II., Gen. *Sanguisuga*.

LEEDS, a town of England, in the W. Riding of Yorkshire, the metropolis of the woollen manufacture, and, in point of population, only exceeded by London, Manchester, Liverpool, and Birmingham. Leeds is situate nearly in the centre of the W. Riding, in the wapentake of Skyrack, and in the pleasant and well cultivated valley of the River Aire. The surrounding country possesses much cheerful beauty; and the view from Woodhouse Moor, one of the most elevated parts of the borough, is not exceeded in any part of the Riding. For manufacturing and commercial purposes, the situation of Leeds is highly advantageous, especially since the introduction of railways. It is now the terminus of the two great lines from London—the Midland and the Great Northern—and is, besides, the terminus of the North-Eastern, and the Manchester and Leeds Railways; whilst it stands in close connection with the E. Riding, through the York and North Midland, and the Leeds and Selby Railways. It has also connection with Cheshire, through the London and North-Western Railway; and with Scotland, through the North-Eastern, *via* Darlington and Newcastle; and *via* Lancaster, with the western route to Carlisle and Glasgow. It has also canal transit to Liverpool by the Leeds and Liverpool Canal, and to Hull by the Aire and Calder navigation; these means of transit, combined with the railways, giving Leeds the highest facility for the transmission to the principal seaports of England of its various manufactures, and for receiving at the lowest rate of charge the various kinds of raw material used in those manufactures. Leeds is the centre of a great bed of iron and coal mines. All the advantages for the successful working of machinery are, therefore, within its reach, and hence it has become the seat of several important manufactures, especially woollen, flax, and iron and machine-making.

Though regarded as the capital of the great manufacturing district of the W. Riding, Leeds is not in its centre, but on its border. Eastward and northward the country is wholly agricultural. Westward and to the S.W., in all the valleys, and on all the hills betwixt Leeds and the long and high range that separates Yorkshire from Lancashire, the populous villages resound with the shuttle and the steam-engine. In this district is carried on a woollen manufacture of great extent and of considerable antiquity; a worsted manufacture of extraordinary vigour (a graft on the woollen manufacture); and latterly the iron manufacture, and machine and steam-engine manufacture, besides a manufacture of flax, which has sprung up within the present century, and now constitutes one of the staple trades of Leeds.

Cloth is the staple trade of the town, although the manufacture itself is not the leading one within the borough, being carried on, to a large extent, in townships out of the parish and borough of Leeds. In the town, however, the trade centres, and there the cloth is finally prepared for consumption, by what is technically termed finishing or dressing,—a department so distinct in Leeds from that of the manufacturer, that the persons respectively engaged in them know very little of the art practised by each other. In this respect the Yorkshire cloth trade differs essentially from that of the W. of England; the practice in the latter being for the manufacturer to conduct

Situation
and commerce.

Industry.

Leeds. the two operations of making and finishing the cloth within the same premises, and so to control and direct the entire process, from the sorting of the wool to the delivery of the finished cloth. Several firms in the borough of Leeds, conduct their business on the W. of England model; but, as the rule, the order of the trade is as follows:—The great bulk of the cloths sold in Leeds are produced either in the out-townships of the borough, or in the villages lying W. of Leeds, and principally in Pudsey, Farsley, Rawden, Yeadon, Horsforth, and Guiseley, which are all in other parishes, within an extreme radius of 10 miles from Leeds. The cloths so manufactured are sold in the unfinished or *balk* state to the merchants of Leeds, by whom they are put out to the cloth-dressers or finishers, whose special craft it is to raise the pile or nap on the face of the cloth, and to complete it for the purposes of the tailor and the final consumer.

A very large proportion of the business betwixt the manufacturer and the merchants is conducted in the cloth halls, which are held on Tuesdays and Saturdays from 9 to 11 o'clock. Of these halls there are two—the Coloured Cloth Hall, erected in 1758, and the White Cloth Hall, erected in 1775. Both are built in the form of a square, with double streets, each street having a double range of stands for placing the cloths, behind which the manufacturers take their place, and invite the merchants to purchase. The whole length occupied by these stands is very considerable; and in the two hours during which the halls are open on the market-days, the amount of business transacted is exceedingly large. Within the last 20 or 30 years, however, a great change has taken place in the method of transacting business betwixt the manufacturer and the merchant. The latter orders goods of specific weights, colours, and qualities of the former, and these are delivered direct to him, without being exhibited in the halls. It is, in fact, very probable that more cloths are now made and delivered direct to order, than pass through the halls. The large manufacturers of the surrounding villages very rarely take stands in the halls, their principal business being a direct one with the merchant. At one period it seemed probable that the business of the cloth trade would assume the West of England type. Mr William Hirst, a very skilful manufacturer, introduced goods of superior texture and quality, and by his success induced many capitalists to erect mills on a large scale, in which all the processes of the manufacture and finishing were conducted. The change was, however, only temporary. Many of these mills are now occupied for finishing only, and some have been devoted to other branches of the local manufactures. This economy of the cloth trade seems likely to continue some time yet. If the spinning and weaving of woollen goods by power should become practicable to the extent now practised in the manufacture of worsted and cotton goods, there would, of course, be a great alteration in the entire economy of the trade. But there are peculiarities in the formation of the woollen thread which have baffled, hitherto, the ingenuity of the mechanist to meet by mechanical appliances only. Hence, the old hand-jenny, and the hand-loom continue in extensive, and, indeed, preponderating use, in the woollen trade, though they have been almost superseded in the other textile manufactures.

The spinning of flax by machinery was commenced in the township of Holbeck (in the borough of Leeds), more than eighty years since, by Mr John Marshall, who was one of the first to apply the principle of Sir Richard Arkwright's water-frame, invented in the cotton manufacture, to the spinning of linen yarn.

The works of Messrs Marshall and Company are very extensive, and one portion of them is an object of attraction to all strangers visiting the town. It is a vast room, 400 feet by 220, filled with machinery, all of which is turned by shafting, which requires two coupled engines of 350 horse

power to impel it. The building is lighted by glass cupolas, which admit of ventilation, and in summer are shielded by linen blinds. The whole building is held together by a double series of iron ties, uniting the iron pillars which sustain the many-arched roof. The external form is Egyptian; perhaps the only instance of the adaptation of the style and hieroglyphic symbols of Egypt to the purposes of manufacture presented in any part of Europe.

The spinning of worsted yarn and the weaving of worsted goods were, twenty or thirty years ago, carried on to a considerable extent in Leeds, but have now nearly died out; Bradford, Bingley, and Keighley, with the villages immediately adjoining, having attracted almost the entire trade. The mercantile department of the trade, technically called the stuff trade, long remained more extensive in Leeds than in Bradford, even after the latter town had all but monopolized the manufacture. Within the last ten years, however, nearly all the stuff merchants transferred their establishments to Bradford, though still continuing to reside in Leeds. The stuff trade of Bradford, notwithstanding, is still largely connected with Leeds, the wool-staplers and dyers of the latter having extensive dealings with the manufacturers and merchants of the former town. It is, indeed, probable that more persons are now thus employed in Leeds in this indirect connection with the stuff manufacture, than were ever employed directly in the spinning and weaving of worsted stuffs.

Amongst the smaller branches of the textile manufactures carried on in Leeds, must be enumerated those of silk and carpeting, neither of them unimportant, though falling far short of the flax and woollen trades.

The establishments for the casting of metals, the manufacture of steam-engines, and of machinery of every kind, are on a large scale; and it has, besides, establishments for the manufacture of mechanical tools, which won considerable premiums at the last Paris Exhibition. It is by no means improbable, that the various branches of the forging and casting of iron, and the manipulation of that most important metal into machines and engines for the manufacture of the various fabrics which minister to modern luxury, may before long constitute a more important branch of the local industry than the old and staple manufacture of woollens.

In addition to these principal branches of manufacture, Leeds produces largely in nails, tobacco, snuff, pottery, and glass.

The number of persons employed in mills within the borough of Leeds in 1835, as given by Mr Baker, sub-inspector of factories, was—woollen, 9312; flax, 5926; worsted, 1420. By the census of 1851, those employed in woollen and worsted manufactures amounted to 13,231 males, and 5112 females—total, 18,343; in flax manufactures, 2464 males, and 6722 females—total, 9186; machine-makers and workers in metals, 5734. The total number of persons engaged in some employment was 83,465, out of an entire population of 172,170. Of 38,468, the number of males under twenty years of age, 12,626 were employed; of 45,246 males above twenty, there were 41,886; of 38,987 females under twenty, 9682; and of 49,569 females over twenty, 19,321. These numbers show a very active condition of the industry of the borough. They show, also, that the proportion of males under twenty, and of females, who follow some occupation, is not so great in a large manufacturing borough like Leeds as is commonly believed; especially when it is considered how very large a proportion of the females who are returned as following some occupation are domestic servants. Out of the 19,321 females above twenty engaged in some occupation, 12,959 are either domestic servants, or follow some trade or employment in their own dwellings; leaving only 6362, or about 22 per cent. of the females of the operative class above twenty years of age, who follow out-door employments, chiefly in the mills.

Leeds.

The mechanical and other appliances of industry in the town of Leeds are on a large scale, as evidenced by the number of chimneys that crowd the view, belonging to mills, foundries, dye-houses, and machine and steam-engine establishments. Steam-power is universally employed where practicable; and the whole effective steam agency employed in Leeds is probably not less than 12,000 or 15,000 horse-power.

Religious statistics.

The census of religious worship of 1851 supplies the following particulars:—

	Places of Worship.	Total Sittings.	Appropriated.
Church of England.....	36	25,436	10,193
Independents.....	11	8,305	6,255
Baptists.....	13	5,781	3,981
Society of Friends.....	1	1,100	...
Unitarians.....	3	1,240	550
Wesleyan Methodists.....	26	20,475	12,871
Methodist, New Connection.....	7	2,717	2,075
Primitive Methodists.....	13	3,900	2,293
Wesleyan Association.....	10	4,354	2,916
Do. Reformers.....	4	200	...
New Church.....	1	850	700
Brethren.....	2	250	100
Isolated Congregations.....	5	280	...
Roman Catholics.....	2	1,220	820
Jews.....	2	140	50
Latter-Day Saints.....	1	240	...
Total.....	137	76,488	42,804

The supply of sittings is, in relation to the population, 46 per cent. The extension of religious appliances during the last fifty years has more than kept pace with the progress of the population. The extent of Sabbath-school instruction in Leeds is as follows:—

	Schools.	Scholars.
Church of England.....	46	9,292
Independents.....	14	2,894
Baptists.....	11	1,881
Wesleyan Methodists.....	31	6,387
Primitive Methodists.....	10	1,388
Wesleyan Methodist Association.....	11	2,226
Other denominations.....	24	4,693
Total.....	147	28,761

Education.

The appliances for general education taken from Mr Mann's able report to the Census Commissioners are as follows:—

Public Day Schools.	Schools.	Scholars.
Workhouse and military schools.....	3	485
Collegiate and grammar schools.....	2	242
Other endowed schools.....	7	635
Denominational Schools,—		
Church of England.....	35	6,892
Other denominations.....	28	4,922
Private day schools.....	295	8,658
	371	21,834

Literary institutions.

The preceding figures, in reference to day and Sunday-schools, show that the proportion of day scholars to population is one in 7·8, and of Sunday scholars one in 6.

The educational means of a higher order, and for literary and scientific purposes, in Leeds, are extensive. The Old Library, founded in 1768, at the recommendation of the celebrated Dr Priestley, contains a very valuable selection of books. The New Subscription Library is on a smaller scale, but is, nevertheless, a very useful institution. Besides these, there are several small libraries, chiefly connected with the several religious bodies in the town. In connection with the Leeds Literary and Philosophical Society, established in 1820, occasional lectures are given both by members of the society and by public lecturers. The building contains a laboratory, lecture-room, and a museum, with many fine specimens in natural history, geology, and

Leeds.

antiquities. The Leeds Mechanics' Institute, established in 1825, was originally limited to the purposes of a library, and supplying evening instruction in arithmetic, mathematics, and mechanical and chemical science. The institute was largely indebted to the liberality of the late Benjamin Gott, Esq., and John Marshall, Esq., for a valuable donation of books on literary and scientific subjects. In 1842 it was united with the Literary Society (founded 1834), under the title of the Leeds Mechanics' Institution and Literary Society. By means of an exhibition in 1839, and again in 1842, the Mechanics' Institute had become possessed of a handsome building, originally built as a music saloon. The principal room (the upper one) serves all the purposes of a lecture, reading, and news room and library. By the union of the societies, an excellent collection of books has been formed, and the number of newspapers and periodicals provided is very large. There are day and evening classes in connection with the society, and the curriculum of the education given is of a high order. The School of Art, originally established by the government, is also an adjunct of the society, and is well frequented. The number of members of the literary department solely, was in 1856, 1776; and of boys and others in the day and evening schools, 258. The income of 1855 was L.1700, allowing a very frequent supply of lectures, &c. The institution is in a very flourishing condition. Besides this one central and principal mechanics' institute, there are many subsidiary ones in the out-townships, and in various parts of the township of Leeds. Within the last two years also, a Young Men's Christian Institute, much on the model of the Literary Institution, has been founded, and already numbers 500 subscribers.

Charities.

Of the charities of Leeds, the older are chiefly the dwellings for aged widows, now tastefully rebuilt, and the "Pious Use Property." The annual income of the several endowed charities is about L.5000.

The Infirmary, established in 1767, and finally completed in 1792, stands near the Coloured Cloth Hall. It is a large but plain building of red brick, forming three sides of a quadrangle, and with a large open space laid out in walks and flower-beds, to which the late Richard Fountayne Wilson, Esq. added a munificent grant of 4000 yards, thus leaving a clear and open space down to the Wellington Road. The House of Recovery was opened in 1804, but, being in an unfavourable locality, a new building was erected in 1840, near the present Industrial School, in a very salubrious neighbourhood, and, from the style of the architecture, constituting it an ornament to the town. Besides these are the Benevolent or Stranger's Friend Society, the Dispensary, the Eye and Ear Infirmary, the Church Visiting Society, and the Leeds Guardian Society.

The town and borough of Leeds was incorporated by The municipal letters patent, 2d Charles I., but this charter was cancelled or surrendered. A new charter was granted, 13th Charles II., under the style of mayor, aldermen, and burgesses of the borough of Leeds. The corporation consisted of a mayor, twelve aldermen, twenty-four assistants, and a staff of thirteen officials. The Municipal Act of 1834 gave Leeds a corporation of sixteen aldermen and forty-eight councillors, which has effected great improvements in the management of local matters. In addition to the powers granted to it by the Municipal Reform Act, the town council has acquired, through successive improvement acts, extensive control over the construction of dwelling-houses, the height of rooms, and the width of streets. It has large power to enforce the consumption of smoke, and to determine the height of furnace and engine chimneys, and for the abatement or removal of nuisances of every kind. The corporate expenses for 1856 amounted to upwards of L.25,000.

The management of the highways in the township of

Leeds. Leeds is in the hands of a board of highway surveyors, having under their charge twenty-two miles of paved streets, and ten miles of roads, and who expended, in 1855-56, L.6809. The administration of the poor law in the township of Leeds is in the hands of a board of guardians. In the out-townships, the overseers levy, collect, and administer the rate. The expenditure, in 1855-56, for the township of Leeds, was L.26,693, 5s. 8d., a very small amount, considering the population, and considerably less than in many former years; the amount paid in 1843 being L.31,982 7s. 2d., and, in 1848, L.40,784, 16s. 3d. The aggregate annual charge of public rates, estimating the poor and highway rates of the out-townships at L.10,000, does not fall far short of L.95,000 to L.100,000 per annum. The rates are, in fact, between 6s. and 7s. in the pound on the assessed rental of the borough,—the assessed rental being taken at $\frac{1}{4}$ ths of the actual rental. The supply of water for the township of Leeds is under the management of the town council, who, in virtue of a power reserved to it when the Leeds Water Works Company was incorporated in 1837, have assumed the property of that company. The capital thus assumed, and which is all raised on mortgage given by the town council on the property, is L.270,031, 14s. 9d.; which will be further increased by the works at Arthington, on the River Wharfe, ten miles from Leeds, from which an additional supply of 2,500,000 gallons per day can be obtained. The water is to be pumped from the river by steam power into reservoirs at Arthington, and from thence forced by steam power also, through iron pipes of large diameter, to the reservoir situate at Eccup, a small village 6 miles N. from Leeds. This extension is estimated to cost L.14,000. The supply of water from the existing works being 1,600,000 gallons; the total supply after Arthington Works come into operation will be 4,100,000 gallons per diem. Leeds is supplied with gas by two companies, having an aggregate capital of L.224,487. The value of the gas annually supplied is upwards of L.50,000; or, including the gas manufactured by mill-owners for the use of their mills, about L.55,000.

Places of
amuse-
ment.

Of the places of recreation in Leeds, the principal is the Music Hall, built in 1792. It is a plain structure, and is used far oftener for public meetings than for musical performances. The New Town Hall, provided with an organ and orchestra, it is expected, will almost entirely supersede the Music Hall, which has no organ, and is besides much too small. The Assembly Rooms, over the north end of the White Cloth Hall, were opened about 1780, and are not much used. There are two theatres, and a casino. The Royal Gardens, situate at Headingley, 2 miles from Leeds, in a delightful locality, were originally laid out for botanical and zoological purposes, but are now converted into a place of public amusement. The place of largest public resort is Woodhouse Moor, a bare common N.W. of Leeds, and about a mile from the centre of the town. It is an elevated spot, and commands an exceedingly fine view S. and W. In the summer evenings it is generally thronged with cricket-players, norr and spell players, and others in quest of healthful amusement.

Public
buildings.

The external appearance of Leeds has been greatly improved within the last twenty or thirty years. At the commencement of the century it had only one plain stone bridge over the Aire, now it has six new ones within the borough, two of which are of stone and four of iron, and by no means inelegant structures. The railway approaches and termini have greatly altered the appearance of the place. The latter, though on a large scale, have not yet (1857) assumed the form finally contemplated. The streets of Leeds, under the operation of the Improvement Act, have undergone large alterations, and, since the new sewer was constructed, at a cost of L.150,000, are laid down with a pavement of great strength, and with causeways of

the amplest dimensions. Within the present century an unsightly pile of buildings, including the old Moot Hall, or Court House, has been removed from the northern end of the principal street, Briggate; as also has the old Market Cross; and although the shops and houses are many of them of a remote date and very paltry, the whole view of the street is imposing. Under the Act of Improvement obtained 1856, the town council are empowered to open up a new and spacious street from the front of the New Town Hall to Wellington Street. The greatest change hitherto produced in the town has arisen from the erection of public markets, the rebuilding of churches and chapels, and other public edifices, and its rapid extension of houses west and north, in which quarters the houses have been built in a style far surpassing that of the older portions of the town. Leeds has four market-places—the Leather or South Market; the Central Market, which is, in fact, a great cluster of shops; the Covered Market, in the Vicar's Croft (just completing), for vegetables, &c., at a cost of L.14,000; and an extensive cattle and sheep market, on a very extensive scale, in the North Town End. The parish church is a very ornamental structure; some of the other churches are also in an excellent style of architecture. There is also a jail, erected at a cost of L.43,000.

The Town Hall is a parallelogram of 250 feet by 200, and 65 in height, of Corinthian architecture. The Great Hall is the largest room in England, except that of St George's Hall, Liverpool. It is 161 feet long, 71 feet wide, and 73 feet high, and is calculated to hold 8000 persons. The orchestra is placed at the north end. The town council have voted L.5000 for an organ, and L.8500 for the purpose of erecting a tower or dome over the vestibule. When the new street is opened from this point to Wellington Street, the view in ascending from the latter will be very striking. A large bronze statue of the Duke of Wellington is already placed in the front area, and will be flanked by a statue of Sir Robert Peel, in the same material, which now stands at the south angle of the present court-house. A statue of the late Edward Baines, Esq., formerly M.P. for Leeds, will also be placed in some suitable part of the building, or in the area. These statues were erected by public subscription, at an aggregate cost of upwards of L.4200.

The history of Leeds has been written by two antiquarians—Ralph Thoresby, F.R.S., a learned and pious native of the town, who published his *Ducatus Leodiensis* in 1714, and the Rev. Thomas Dunham Whitaker, LL.D., F.S.A., who republished Thoresby's work and added another volume, under the title of *Loidis and Elmete*, in 1816. The latter work deserves high praise for its ability and antiquarian learning; but it is miserably deficient in its notice of the trades and manufactures of the place, and treats them with the most prejudiced contempt. More recently the civil, ecclesiastical, literary, commercial, and miscellaneous history of Leeds, and the surrounding towns and villages, has been written by the late Rev. Edward Parsons, of Halifax, in 2 volumes—a work which brings down, very completely, the history of Leeds to the year 1834. A more recent work by James Wardell, Esq., deputy town-clerk of the town of Leeds, brings down the municipal history of the borough to the year 1846. Both these works are of great value to the historian and antiquarian; but it is no disparagement to the authors to say, that the changes produced by the repeal of the Corn Laws, the adoption of railway transit, and other social and municipal changes in the laws, have rendered necessary a new history of Leeds. It is difficult to realize the contrast betwixt the Leeds of 1832, the time of the passing of the Reform Bill, and Leeds as it now is; and it is quite possible that ten years hence the historian of Leeds may smile at the modest tone in which Leeds, commercially and nationally, is now spoken of.

Leeds.

Leek
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Leeward
Islands.

Leeds has been distinguished for the last sixty years by the energetic action of the public generally, on all political questions, including the slavery question, Reform Bill, Catholic Emancipation, repeal of the Corn Laws, repeal of the Test and Corporation Acts, and the repeal of the East India monopoly. The newspapers published in Leeds are, the *Leeds Mercury*, an influential journal published three times per week; the *Leeds Times*, more radical in its tone than the *Mercury*; and the *Leeds Intelligencer*, which is Conservative.

The borough and parish, which are co-extensive, measure in their longest diameter upwards of 7 miles, with a circumference of 30, cover 21,470 acres, and comprise, besides the township of Leeds (properly so called) ten out-townships, nearly all engaged in the staple manufactures of woollen cloth, flax, or iron. Chapel Allerton, Potternewton, and Headingley are, however, mere suburbs of Leeds, a very large proportion of the inhabitants of those townships being persons whose places of business are in the town of Leeds. The population of the township of Leeds, and of these ten out-townships, in 1851, was as follows:—Leeds township, 101,490; Armley, 6190; Beeston, 1973; Bramley, 8949; Chapel-Allerton, 2842; Farnley, 1722; Headingley, 6105; Holbeck, 14,152; Hunslet, 19,466; Potternewton, 1385; Wortley, 7896—total, 172,170.

The value of real property in the borough of Leeds assessed in 1843, consisting of lands, houses, tithes, quarries, mines, and ironworks, was L.342,937, 9s. 10d.; or, including the out-townships, L.544,272, 1s. 1d. The present value is probably about L.626,000.

The census of 1851 showed that there were 36,165 inhabited houses in the borough of Leeds, 1646 uninhabited, and 259 building. Since the passing of the Reform Act, Leeds returns two members to parliament. (T. P.)

LEEK, a market-town of England, county of Stafford, on an eminence above the Churnet Water, an affluent of the Trent, 31 miles S. by E. of Manchester, by railway. The only public buildings are, the parish church, erected in 1180, the town-hall, and chapels. The silk manufacture has long been carried on here in its various branches of silk thread, buttons, ribands, handkerchiefs, &c. Market days, Wednesday and Saturday. A navigable cut from the Caldon and Uttoxeter Canal approaches to within a short distance of the town, while by railroad it has communication with all the manufacturing districts of central England. Coal and lead are found at Bluehills, in the neighbourhood, the former in considerable quantities. Pop. (1851) 8877.

LEER, a town of Hanover, landdrostei of Aurich, on the Leda, about a mile above its junction with the Ems, and 14 miles S.S.E. of Emden. Vessels of 150 tons burden come up to the town, and hence a considerable traffic is carried on, chiefly in agricultural produce. Chief manufactures, linen, hosiery, soap, beer, vinegar, and brandy. Pop. 6500.

LEEWARDEN, a town of Holland, capital of the province of Friesland, on the Ee, and on the great canal uniting the Zuider Zee and the Ems, 32 miles W. of Groningen. It is surrounded by an earthen rampart and ditch, and is intersected by numerous canals, the banks of which, and the ramparts, being planted with trees, and forming agreeable promenades. The town is well built, and is the seat of a large trade. The chief manufactures are linen goods and paper. Among its public buildings are the town-hall, the palace of the Prince of Orange, exchange, house of correction, several handsome churches, and a Jewish synagogue. Pop. (1854) 24,461.

LEEWARD ISLANDS, a name frequently applied to those of the West India Islands lying between N. Lat. 15. and 19., and W. Long. 60. 30. and 65. 40. The group comprises the British possessions of Antigua, Dominica,

Montserrat, Nevis, St Christopher's, Anguilla, Barbuda, and the Virgin Islands, which are all included under one government. The French, Dutch, Danes, &c., have also possessions in the group. There are twenty-three islands, besides numerous islets, having in all an area of about 1700 square miles, and a population of about 321,000.

LEFKOSIA, the capital of Cyprus. See NICOSIA.

LEGATION. See DIPLOMACY.

LEGATUS, amongst the Romans, an ambassador, or lieutenant-general. Legati were of three kinds,—1, Those sent by foreign nations on an embassy to Rome; 2, Those sent from Rome on an embassy to foreign countries or the provinces; 3, Those who served under Roman generals during war, or under the proconsuls and prætors in the provinces.

1. Foreign ambassadors, on approaching Rome, sent into the city the name of their nation, and the object of their embassy. If they came from a hostile people, they were either obliged to leave Italy unheard, or were admitted to an audience from the senate, who assembled for that purpose in the temple of Bellona, without the city. If their nation was friendly, they were received into the city, and deposited their names with the quæstors at the temple of Saturn. If they were persons of distinction, or came from an ally, one of the inferior magistrates, sent by the senate, met them on their landing in Italy, and accompanied them to Rome. All ambassadors were treated as public guests, and considered inviolable.

2. A Roman ambassador was elected by the senate from persons of high rank only; had the sacred character of a priest, and the power of a magistrate; was supported at the public expense during his journey; and if he died during his embassy, was honoured with a public sepulchre.

3. A lieutenant-general was generally a person of high military skill, and was appointed by the consul, prætor, or dictator, under whom he was intended to serve. His nomination, however, was not legal until sanctioned by the senate. His duty was to aid his superior officer, by advising him in all great emergencies, by acting as his substitute, both in civil and military affairs, and by assuming his insignia, as well as authority, during his absence. In the last case, he was called *legatus pro prætore*. The number of legati under one superior differed in proportion to the importance of the war, or the extent of the province.

LEGENDRE, ADRIEN MARIE (1752–1833). See SIXTH DISSERTATION, § 95.

LEGHORN (Italian *Livorno*), a free seaport-town on the W. coast of Italy, grand duchy of Tuscany, is situated at the extremity of a low and partly marshy plain, in N. Lat. 43. 32. 40., and E. Long. 10. 20.; 12 miles S.S.W. of Pisa, 54 miles W. of Florence by railway, and 85 miles S.E. of Genoa by sea. It is built nearly in the form of a square, surrounded by walls, with five gates, and intersected by regular, wide, and well-built streets. The old town of Leghorn, fronting the harbour, was long separated from the newer portions by a wall, and hence the streets here are narrower, and the buildings more crowded than in other parts of the town. It is traversed, however, by the noblest avenue in the city, the Via Grande, a wide street stretching from the Arsenal to the Pisa Gate, and having a large square in its centre, where many of the public offices are situated. To the N. and N.W. of the old town is what was formerly a suburb, called New Venice, but now incorporated with the rest of the city. It is intersected with canals, by means of which the various merchants' warehouses are supplied with their goods direct from the harbour. On the other side of the old town, to the S. and S.E. of it, a new part, now also included in the city, contains many elegant streets and mansions, the residences of the more opulent merchants. Leghorn cannot boast of

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Leghorn.

Leghorn. many fine edifices. Those most worthy of notice are as follow:—The Duomo, or cathedral, the oldest church of the town, standing in the Piazza Grande. There is nothing remarkable in its architecture, while its accommodation is so limited that a new and larger cathedral has been commenced, to supply the want. The Tower of Marzocco, or painted lion; the palace of Count Lardarel, containing a valuable collection of paintings; and the statue of Ferdinand I. de Medici, which stands close to the quay. Besides these, there are several parish churches, two Greek churches, a rich Jewish synagogue, and an English Protestant place of worship. Of the convents, the most famous is that situate on Monte Nero, which has in its possession a portrait of the Virgin, said to have floated from the island of Negropont to the Italian shore, unscathed by the violence of the sea. Water is brought into the town by a great aqueduct from Colognole, 12 miles distant. The accommodation of the harbour, however, is not in keeping with the size and importance of the town. Although possessed of two quays, neither of them have sufficient depth of water for large vessels, nor room for all those which are able to enter. This has been caused partly by the great quantities of sand washed in by the Mediterranean, and partly from want of due care on the part of the authorities. The port possesses two harbours. The outer and larger one is protected by a stone pier about 3000 feet long, and can be entered by ships of about 100 tons; while the inner harbour, which stretches into the town, has been so filled up that it is used only by small craft, and as building and repairing docks. A new harbour is, however, in course of construction south of the present one, and, when completed, will have sufficient depth of water for the largest vessels. At present large ships have to discharge their cargoes in the roadstead, which lies between the shore and a sandbank W.N.W. of the harbour, 4 miles in length by 2 in breadth, and having from 3 to 18 feet of water over it. The hold is good, and every facility is afforded for landing goods and passengers by means of lighters. A lighthouse, standing on a rock close to the mole, is seen many miles at sea. The lazaretto accommodation here is unequalled in Europe. There are three houses, for vessels with clean, foul, or *compromised* bills of health respectively.

The trade of Leghorn has been for many years in a flourishing condition, greatly owing to the privileges extended to the port by the Tuscan authorities; for, with the exception of the few government monopolies, goods can enter here more cheaply than perhaps at any town on the continent. Indeed, in some cases, articles of British manufacture are to be had in Leghorn at a lower rate than in England itself. But, besides the port privileges, the municipal laws are so framed that persons of all creeds and religions can live here in the enjoyment of their respective religious services. The English cemetery of Leghorn—the resting-place of Smollett and others known to fame—was long the only Protestant burying-ground in Italy. The effect of these wise measures is manifest in the number and variety of the shipping which resort to this port. There are annually about 4000 vessels, with about 400,000 aggregate tonnage, entering its harbour, while the clearances are nearly the same. Of these, the largest number are Italian coasters. The others, in the order of the importance of their trade, are British, French, Greek, American, Austrian, Spanish, Dutch, Swedish, and Ottoman ships. The articles of trade are numerous, Livorno being the great emporium of Tuscany and the adjacent states. Its articles of export and import comprise all the Italian products and manufactures, such as argol, borax, grain, fish, straw hats, hemp, olive oil, rags, seeds, silk, skins, marble, tallow, timber, wool, vermicelli; and macaroni. Besides these, the articles peculiar to the Levant and N. coast of Africa for many years found their way to Western Europe, in great part, by way of Leg-

horn; but, as of late the British and American traders have gone direct to these parts, this traffic has fallen off, and that of the Peninsula become the staple trade. The following table of the chief imports into Leghorn, during the three years 1850, 1851, 1852, is taken from Macculloch's *Commercial Dictionary*:—

Chief Imports.	1850. lbs.	1851. lbs.	1852. lbs.
Coffee.....	3,023,000	4,439,000	3,610,000
Cotton.....	211,500	650,700	138,900
Indigo.....	275	259	384
Pepper.....	298,500	635,000	836,000
Sugar, Brazil.....	602,000	135,000	89,000
... Crushed.....	13,374,000	7,536,000	15,132,000
... East India and Santos..	1,512,800	129,000	966,000
... Havanna.....	3,400,000	1,149,000	2,510,000
... Loaf.....	18,500	6,000	37,000

The next table shows the quantity and value of the principal articles exported from Tuscany to Great Britain in the years 1853 and 1854, from the *Government Report of Trade and Navigation*:—

Principal Exports to Britain.	Quantity. 1853.	1854.	Computed Value. 1854.
Anchovies..... lb.	223,062	222,966	5,972
Boracic Acid..... cwt.	20,768	23,709	106,691
Corn, all kinds..... qr.	46,081	9,275	33,389
Marble, manufactured cwt.	4,555	8,863	11,079
... rough..... solid ft.	70,510	106,601	66,627
Olive Oil..... tuns	1,474	885	68,853
Rags for Paper..... tons	996	2,002	51,051
Seeds, Flax and Linseed..... qr.	3,256	20,650	63,240
Skins, Lamb and Kid, undressed..... No.	1,237,138	934,984	46,839
Straw, articles of..... lb.	43,664	26,796	38,068
Vermicelli and Macaroni..... cwt.	1,444	1,607	3,750
Wheatmeal and Flour cwt.	70,291	55,594	60,690

The total value of the imports into Leghorn, during the years 1852–3, and 1854–5, commencing October 1, was, in the former year, L.4,508,000, and in the latter, L.5,690,000; while the total value of exports for these years was L.2,848,800 and L.3,120,000 respectively. In 1856 there were 112 vessels, with an aggregate burden of 27,059 tons, and 414 small craft, with an aggregate of 7879 tons, belonging to the port.

The early history of this city is, to a great extent, enveloped in obscurity. The first mention we have of it is by Cicero, who calls it *Labro*. It was, however, in his time, and for many centuries after, but an insignificant fishing station, situate about 4 miles to the S. of Portus Pisanus, which then occupied the commercial position now held by the modern Livorno. In the fifteenth century it acquired its first importance as an Italian seaport, after having passed from the hands of the French to the Genoese, and from them to the Florentine Confederation. A harbour was constructed by the latter immediately after their acquisition, and town walls built. Stronger and more extensive walls were commenced in the year 1577 by Francesco I., and public buildings were afterwards erected by his successor, Ferdinand I. This wise ruler was, in reality, the great founder of the Livorno trade. He was the first to pay no respect to creeds or religions; but, on the contrary, invited all those who were anxious to prosecute commerce honourably and with perseverance, whether they happened to be Roman Catholic, Protestant, Greek, Jew, or Mohammedan. Under his liberal government the port of Leghorn became the only town where freedom of opinion was recognised, and formed a leading principle at that time. From the end of the sixteenth century until the year 1796, when the town was taken by the French, its trade and commercial relations increased and extended; but with the French occupation commerce and freedom were virtually at an end. After the conclusion of peace, however, in

Legion
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Leibnitz.

1814, the port recovered its traffic, and has now gained the highest position as a seaport in the Peninsula. Its progress was slightly checked during the revolution of 1848 and 1849, when the Austrians seized it, and occupied it for some time, a proceeding which, fortunately, had a less prejudicial effect on the trade than might have been expected. The custom-house officers were more strict in searching vessels for arms, but otherwise traffic was not impeded.

The manufactures of Leghorn are unimportant. Those most worthy of mention are ropes, woollen caps, alabaster and coral ornaments. Many boats belonging to the port are sent annually to the coral fisheries off the coasts of Sardinia and Barbara. There are several mineral springs in the neighbourhood of the town. Pop. (1855) 79,962, many of whom are Jews. The government, or province of Leghorn, including the island of Gorgona, has an area of 24,320 acres, with a population of 92,200 persons.

LEGION. See *Roman Army*, under ARMY.

LEGITIMACY. See PARENT AND CHILD.

LEIBNITZ, GOTTFRIED WILHELM, was born at Leipsic on the 3d of July 1646. At the age of six he lost his father, Frederic Leibnitz, the Professor of Ethics in the University of Leipsic, from whom he inherited a considerable fortune and a valuable library. The latter part of his heritage proved the more useful, for with its aid he may be said to have educated himself, although he attended from his early years the Nicolai School of his native city. Impatient of the slow progress at school, he began to read in private all the Latin and Greek authors that fell in his way, with so much profit, that before he was twelve (as he says himself), he "understood the Latin writers tolerably well, began to lisp Greek, and wrote verses with singular success." For logic, which he began to study soon afterwards, he showed as great an aptitude. In his fifteenth year he entered the University of Leipsic, where, though his principal study was law, he devoted himself to many other branches of knowledge, and especially to mathematics and philosophy. After passing a year in the study of the former science, under the celebrated Ehrhard Weigel at Jena, he returned to Leipsic, and took the degree of Bachelor in Philosophy in 1663. About this time he began to peruse with ardour the writings of Plato and Aristotle, and he used to spend entire days in a wood near Leipsic in the vain attempt to reconcile their systems. His acquaintance, however, with Greek philosophy was evinced by his metaphysical dissertation, *De Principio Individuationis*, which was read in 1664, when he graduated as Master in Philosophy. In his twentieth year, being refused at Leipsic, on account of his youth, as a candidate for a Doctor of Laws, he repaired to the University of Altorf, where he took his degree. His exercise on this occasion, which was afterwards published under the title *De Casibus in Jure Perplexis*, elicited great general applause, and procured for him the offer of a law professorship at Altorf. This he declined, and repairing to Nuremberg, chose rather to enter a society of alchemists, which he found existing there. Collecting all the current terms in books of alchemy, he wrote a letter, which, though unintelligible to himself, so favourably impressed the society, that he was forthwith introduced into their meeting, and chosen secretary. About this time the Baron de Boineburg, chancellor to the Elector of Mentz, came to Nuremberg, and was so captivated by the learning and genius of Leibnitz, that he advised him to devote himself to jurisprudence and history, and with that intent to remove to Frankfort-on-the-Maine, where he promised to obtain for him some office under the elector, his master. This advice Leibnitz followed; and the result of his studies at Frankfort appeared in his *Nova Methodus discendæ docendæque Jurisprudentiæ*, published in 1667. In 1668, at the request of Boineburg, he wrote a treatise, supporting the claims of the Prince of Neuburg to the elective throne

of Poland, which was then vacant, and sought by a crowd of candidates. This work, though elaborately written in Latin, and containing sixty propositions rigorously deduced from a series of axioms, did not attain its direct object. Neuburg was rejected; but, as a reward for his services, Leibnitz was nominated, through the influence of Boineburg, an electoral councillor. With an ever-active ingenuity, he formed a project at this period of re-casting the *Encyclopædia* of Alstedius, by rendering it more comprehensive, by introducing the articles in the order of the subjects, rather than in the order of the alphabet, and by appending to the treatise on each science a condensed account of its origin and progress, and of the authors who have treated it in detail. This design, one of the favourite ideas of the rest of his life, was never executed. In 1670, for the purpose of vindicating the works of Aristotle, he followed the unusual plan of editing a work of Nizoli against Aristotle, and expressing his own views in the preface and notes. His bold but paradoxical treatises, *Theoria Motus Abstracti*, and *Theoria Motus Concreti*, appeared in 1671. In the same year he was employed by Boineburg to write a defence of the doctrine of the Trinity against the attacks of the Pole, Wissowatius, and he produced his *Sacrosancta Trinitas per nova Argumenta logica defensa*.

In 1672 Leibnitz accompanied the son of his patron Boineburg to Paris. Here, amid distractions of every kind, he devoted his time almost exclusively to mathematics, a study in which he confessed himself to have been hitherto merely a tyro. His newly-formed intimacy with Huygens, and his eager perusal of the works of Galileo and Descartes, inspired him with ardour in his new researches; and he attempted, with great ingenuity, but with little success, to reconstruct and render perfect the arithmetical machine of Pascal. An offer made at this time, by the Academy of Sciences, to admit him into their body as a pensioner, on condition that he embraced the Romish faith, was declined.

On the death of Baron de Boineburg in 1673, being released from his duties at Paris, he visited England, and was received at once into the society of Boyle, Oldenburg, Collins, Wallis, Gregory, and Newton, and was elected a member of the Royal Society. The death of the Elector of Mentz in 1674, which left him without a patron, induced him to communicate his embarrassments to the Duke of Brunswick-Lunenbourg, who immediately tendered him the office of a councillor, with a pension and the liberty of non-residence. Leibnitz accordingly returned to Paris to prosecute his mathematical studies. After a brief sojourn, he paid a second visit to England, and repaired, by way of Holland, to the court of his new patron at Hanover, in 1676. Here he lived in a style highly congenial to his taste, employed in enriching the ducal library with valuable works and manuscripts, and receiving the full sympathy and assistance of his benefactor. About the same time, he was engaged in writing his *De Jure Suprematus et Legationis Principum Germaniæ*, and in furthering the plan of publishing the *Acta Eruditorum*, the first volume of which appeared at Leipsic in 1682.

On the death of the Duke, in 1679, his successor, Prince Ernest Augustus, afterwards George I. of England, retained the same favour for Leibnitz, and employed him to write the History of the House of Brunswick. In pursuit of materials for this task, he spent three years travelling through Franconia, Bavaria, Suabia, Austria, and Italy, searching libraries, archives, tombs, convents, charters, old manuscripts, and rare books, and amassing, in addition to the documents requisite for his History, materials available for philology, geology, and the philosophy of history. The first digest of some of these materials was his great work *Codex Juris Gentium Diplomaticus*, published in 1693, and followed by a second volume in 1700. This book, though a mere collection of manifestoes, treaties, declarations, and

Leibnitz.

Leibnitz. other public documents, is accompanied by an able preface, containing, amid many original views on the principles of natural law, his system of ethics. His accumulations supplied the matter of another work, *Accessiones Historice*, published in 1698; but not until the publication of the *Scriptores Rerum Brunsvicensium* in 1707-11, did they appear to be applied to the purpose for which they had been intended. Even this latter work was designed merely as an introduction to his History, of which he left nothing but a bare outline, published after his death in the *Acta Eruditorum* for 1717. In this outline he proposes to begin the History by a dissertation on the state of the globe, and specially of Germany, before the creation; and after an account of the manners and languages of the various tribes that successively settled in that country, to end with the real History of the House of Brunswick, including, among less important subjects, a notice of all their intermarriages and alliances with other families. His general opinions on the first of these subjects were published in his *Protogæa*, a posthumous essay, which entitles its author to be called the Founder of geology.

In 1699 he became a member of the Royal Academy of Sciences at Paris. In the following year he co-operated with the Elector of Brandenburg (afterwards Frederic I. of Prussia), in organizing a Royal Academy of Sciences at Berlin, and was rewarded for his valuable counsel with the office of President of the new institution. To the *Miscellanea Berolinensis*, which the Academy afterwards published, Leibnitz contributed many valuable papers. A correspondence which he had for a long time maintained with Bossuet touching a plan for the reunion of the Catholics and Protestants came about this time to an unsuccessful termination. He was also engaged in a vain attempt to construct a universal language; but of his long and deep meditations upon this subject, nothing remains except a few hints found among his papers after his death.

In answer to the sceptical views of Bayle on the origin of moral evil, Leibnitz, in 1710, published his most complete work, the *Theodicæe*, containing his chief opinions on metaphysics and theology, and, among others, his doctrines of pre-established harmony and optimism. So courteous and tolerant was he, in this work, towards his opponents, that several eminent men unjustly suspected him of favouring the doctrines he refuted. In 1711, Peter the Great, requesting an interview with him at Torgau, consulted him regarding the civilization of his empire, and, along with a pension, conferred upon him the dignity of a privy councillor. His latter days were embittered by his vehement controversy with Newton, touching the discovery of the differential calculus. For some time he had been grievously afflicted by fits of the gout, and having, amid his multifarious acquirements, a slight knowledge of medicine, he tried a remedy on the 14th of November 1716, which, after producing violent spasms, caused his death in less than an hour. His tomb is marked by a monument in the form of a small temple, and bearing the inscription *Ossa Leibnitii*.

Leibnitz was about the middle size, and had a spare but vigorous frame, a pleasant countenance, and keen eyes. His early-formed habit of incessant study had given him an habitual stoop, and changed his hair prematurely to gray. Invariably pursuing his studies far into the night, he sometimes denied himself the repose of his couch, and after sleeping a few hours in his chair, resumed his labours with the returning light. This abstinence he is said to have practised for several successive weeks; and some of his deep meditations kept him fixed in his chair, with scarcely an intermission, for several days together. He was equally fond of reading and contemplation. Perusing books on almost every subject, he assisted his recollection by taking short notes of their contents; but even this small aid was often unnecessary. So accurate and tenacious was his

memory, that at the age of seventy he could recite long passages from Virgil without committing a single mistake; and so well assorted was his extensive information, that George I. was wont to call him a "living dictionary." His correspondence, which comprised the most illustrious names in Europe, and extended even to China, occupied a great portion of his time. Preferring solitude to society, he was, nevertheless, as animated and eager in conversation as in study; ready and fluent in expressing his thoughts; easily irritated, but as easily appeased. Though a zealous advocate of some of the great doctrines of Christianity, he was characterized by a wide religious tolerance, which, more than the character of his recorded opinions, laid him open to the charge of a secret leaning to the Roman faith. This charge, founded on an unfinished manuscript of his, which was afterwards published under the title of *Systema Theologicum*, has been shown by Dr Guhrauer, in his life of Leibnitz, to be inconsistent with the life and previous writings of Leibnitz. Krug and Schulze have also written elaborate apologies on the subject, and the charge is now wholly abandoned. For his philosophy and opinions, see *DISSELTATIONS* I., II., and IV.

The principal sources of the biography of Leibnitz are,—his Life by Brucker, in the *Historia Critica Philosophiæ*; his Eloge by Fontenelle, in the *Hist. de l'Acad. des Sciences de Paris*, 1716; Bailly's *Eloge de M. de Leibnitz*, 1769; Kästner's *Lobschrift auf Leibnitz*, Altenb. 1769; but more especially his *Biographies* by Guhrauer, 2 vols. Breslau, 1842, and by Vogel, Leipsic, 1846. The works of Leibnitz have been singularly unfortunate in point of editing. His miscellaneous papers seem an exhaustless mine from which new treasures are continually brought to light. Four quarto volumes of posthumous works were published by Raspe in 1765; but these find no place in the *Opera Omnia*, published by Dutens in 1768. Of recent editions the most worthy of notice are those by Erdmann, Berlin, 1839-40; the *Deutsche Schriften* by Guhrauer, Berlin, 1838; *Œuvres de Leibnitz* par M. A. Jacques, Paris, 1842; and the *Gesammelte Werke*, edited by Pertz, Hanover, 1847-56, not yet completed.

LEICESTER, the chief town of the county of that name, 97 miles from London by road, and 103 by railway. It is pleasantly situate in a gentle hollow, on the bank of the River Soar. It is a very ancient town, founded, it is said, by a British king,—the King Lear of Shakspeare,—and was a Roman station, known by the name of *Ratae*. Afterwards it formed one of the five Danish burghs, or commonwealths. It was a populous city at the time of the Norman conquest. A parliament was held here in the reign of Henry V.; and Richard III., defeated and killed at Bosworth, was buried in a Franciscan convent, which then stood near St Martin's church. The town was at one time fortified, and had a strong castle; but nothing remains of the latter except the mound or earthwork of the keep. The principal streets intersect each other, and contain some good houses: indeed Leicester, as a whole, is a handsome town. The public buildings are,—the Theatre, the Assembly Rooms, the Temperance Hall, the County Lunatic Asylum, the Infirmary, the Railway Station, the Collegiate School, and the Banks, and some of them are very fine edifices. The county jail, situate at a little distance from the town, resembles a baronial castle, having portcullis and flanking towers, and turrets on the boundary walls, which inclose three acres of ground. There are nine churches, chief amongst which are St Martin and St Mary, and twenty-six dissenting chapels. Leicester is the principal manufacturing town in the county; more stockings are made here than in any other English town, with the exception of Nottingham. Yet, when stocking-knitting was first introduced, at the time of the Revolution, it was so unpopular, that it became necessary to carry it on by stealth. The other branches of industry are wool-combing and dye-

Leicester-
shire.

ing, and the manufacture of all kinds of fancy hosiery. Steam power is largely used in the town, coal being easily obtained by railway and canals communicating with the neighbouring coal-fields. Leicester contains ten parishes, and some extra-parochial places. It is divided into seven wards, and governed by a town-council, consisting of a mayor, 14 aldermen, and 42 councillors. It returns 2 members to parliament. The population was, in 1821, 31,036; 1831, 40,639; 1841, 50,853; 1851, 60,642.

LEICESTERSHIRE, an inland county of England, bounded on the N. by Nottinghamshire, N.E. by Lincolnshire, E. by Rutlandshire, S.E. by Northamptonshire, S.W. by Warwickshire, and N.W. by Derbyshire. Its name is derived from Leire, the ancient name of its chief river, the Soar. Its greatest length is, N. and S. from the junction of the counties of Lincoln and Nottingham with Leicester, to Lutterworth, 44 miles; and its greatest breadth is, E. and W. from near Rockingham to the neighbourhood of Ashby-de-la-Zouch, 40 miles. It contains 514,164 statute acres, and is the twenty-eighth of the English counties in size.

The surface of the country is a series of gentle undulations, with full and sluggish rivers winding through rich pastures intersected with hedgerows. It is a table-land, and the highest ground consists of the Charnwood Hills, in the N.W. part of the county, generally called the Forest, though now destitute of trees. It is a group of hills exhibiting sharp distinct prominences of a rugged character. The highest of them, Bardon Hill, between Ashby-de-la-Zouch and Leicester, is 852 feet above the level of the sea, and commands, perhaps, a more extensive view than any other elevation in this country: the eye ranging as far as Lincoln, 60 miles off in one direction; the Dunstable Hills, 80 miles off in another; to the Malverns in Worcestershire, the Wrekin in Salop, the Peak of Derbyshire, and the mountains of North and South Wales. This expanse comprises one-fourth of the surface of England and Wales.

The county belongs to the basin of the River Trent, which forms part of its northern boundary. It is nearly equally divided between the lias and sandstone formations; the former occupying the greater part of the eastern, and the latter the western side of the county. The coal formation exists to a considerable extent on the W., and clay-slate in the Charnwood Hills. The soil varies, but it may be described as consisting either of clay or loam, as there are very few portions of it that are calcareous, sandy, or gravelly. It is, for the most part, strong and stiff. The climate is mild.

The rivers of the county are,—the Soar, 40 miles long, rising on the S.W. edge of the county, between Hinckley and Lutterworth, and falling into the Trent, below Kegworth; the Wreak, 25 miles long, rising near Oakham, in Rutlandshire, and falling into the Soar, near Mount Sorrel; and the Anker, the Sence, the Mease, the Swift, and the Devon. These belong to the system of which the Trent is the trunk. There are, in addition, the Avon, a tributary of the Severn, and the Welland, which also passes out of the county. The Soar is navigable for 7 miles from its junction with the Trent, and this part of it, as well as a part of the Wreak, is incorporated with the system of navigation which overspreads the county. The canals are,—one from Leicester to Loughborough, 11 miles long, and rising 45 feet; one from Leicester to Melton-Mowbray, 11 miles long; one from Leicester to Foxton, 17 miles long, or, including its branch to Market-Harborough, 21 miles, having a rise of 120 feet; one from Foxton to the Grand Junction Canal, 8 miles of it being in the county; one from Melton-Mowbray to Oakham; and one from Ashby-de-la-Zouch to Nuneaton, Warwickshire. These canals, being connected with the general system of navigation, give the county access to all the great towns of the country, and to

the eastern, western, and southern sea-coasts. The railway communications consist of a line from the Ashby Canal to Moira; a line running N.W. from the River Soar, near Leicester, to Swannington, 15½ miles long, having four branches, and principally used for the conveyance of coal; the Midland Counties Railway, traversing the county from S. to N., entering the county near Lutterworth, and passing by Syston, Leicester, and Loughborough to Derby; and the Syston and Peterborough Railway, running N.E. The London and North-Western Railway also skirts the south and south-eastern boundary of the county.

Nearly two-thirds of the county are in permanent pasture, the greater part of which lies on the lias formation, while the corn land is almost entirely limited to the sandstone formation. The quantity of waste land is very small, and the open fields, from the existence of which it became a great hunting county, have nearly disappeared. The richest pasture is the low ground along the course of the rivers, and these are frequently held in conjunction with arable farms, the stock being wintered on the latter, and fattened in summer on the former. Much of the inferior grass land is employed for dairy purposes, and a large quantity of full-milk cheese is made for consumption in the N. of England. The richest cheese in the world, that called Stilton, from having been sold first in that town, is also made to a large extent in the neighbourhood of Melton-Mowbray. The mode of its manufacture was long kept a secret in a few villages; its richness arises from one quantity of milk being skimmed, and the cream taken from that being added to more milk, so that the cheese has double the usual quantity of cream in its composition. The average yield of ordinary cheese of a dairy, on moderate land, is estimated at about 3 cwts., and on better land as high as 5 cwts. for each cow. The land is much subdivided, the greater part of it forming estates of from 50 to 500 acres each, belonging to yeomen who cultivate the land themselves. The size of the dairy farms varies from 100 to 500 acres. Rent is very high, owing to the proximity of large towns, the facilities of communication which are afforded by the canals, railways, and good roads traversing the county, and the crowd of men of fortune which is attracted thither during the hunting season, a sport for which the county has long been famous, and for which it is still admirably adapted. The land, on the whole, is imperfectly cultivated, and draining and other improvements have made little progress; indeed, like most grass countries, it has slept upon its natural riches. The arable crops average from 3 to 3½ quarters of wheat, and from 2 to 4 quarters of beans per acre. The county has, however, produced an eminent farmer, Bakewell, from whose farm, Dishley Grange, near Dishley, emanated the great art of transforming breeds of domestic animals, one of the most valuable conquests of human genius. The race of sheep introduced by him—the Dishley, or New Leicester breed, as it is called,—excels all other known races for precocity, producing animals ready for fattening in one year, and full-grown in two years. Bakewell also improved the cattle of the county, and though his success was not so great as it was with sheep, he has led to the modification of every breed of horned cattle throughout the kingdom. He also improved the breed of horses, and his black horses; of the cart kind, originating principally from mares which he brought from Flanders, were the first in this part of the country to plough two horses abreast. Notwithstanding the decided superiority of the New Leicester sheep, the old breed is still reared, as well as a race of forest sheep, still more inferior. The Old Leicesters are heavy, slow to fatten, and give a coarse wool.

The mineral productions of the county are coal, freestone, limestone, coarse slate, clay for making bricks, gypsum,

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and a species of red granite, locally used for paving streets, and building houses. Bredon Hill is composed of a valuable kind of limestone, which forms an excellent cement, in water, and which was used in the erection of the pier at Ramsgate. There are two coal-fields, one to the N.E. of Ashby-de-la-Zouch, six or seven miles long, the other S.W., and extending 11 miles; these terminate the English coal-fields in the direction of the German Ocean. One of the beds is from 17 to 21 feet thick, and the mines are worked at an average depth of 750. Leicestershire is also a considerable manufacturing county; its productions are stockings, and all kinds of fleecy hosiery, bobbin-net lace, felt-hats, and carpets. Six-tenths of the stockings are of the coarse kinds, and it is estimated that 20,000 knitting-frames, and 35,000 persons are employed in this branch of manufacture. A large number are also occupied in wool-combing, and in spinning woollen and cotton yarn. Leicester, Loughborough, and Hinckley are the chief localities of manufacturing, but it is carried on very generally throughout the towns and villages of the county.

Leicestershire was anciently part of the territory of the Coritani, and was afterwards included in the Roman province of Flavia Cæsariensis. It contained several Roman stations, but the only traces of them remaining are those of *Rata* (Leicester). Under the Saxons the county was incorporated with the kingdom of Mercia. In the seventh or eighth century it was the seat of a bishopric, which in the ninth was united with the see of Lincoln. In 878, in accordance with a treaty between Gothrun the Dane, and Alfred the Great, the county became part of the Danish territory; but in the reign of Edward the Elder, it was conquered by the Saxons, and restored to the kingdom of Mercia. William the Conqueror divided the county amongst his relations and friends, and they built castles upon their possessions; but these edifices have perished, all that remains of them being a few fragments of Ashby and Groby Castles. Belvoir Castle was destroyed by Lord Hastings, in the wars of the Roses. The present edifice, the noble residence of the Dukes of Rutland, is of modern date. Leicester Castle was captured by William Rufus, in the struggle with Robert Duke of Normandy. The county was a battle-field in the contests of John and Henry III.; and in 1485, the war of the Roses ceased in the defeat and death of Richard III. at the battle of Bosworth Field, near Market-Bosworth. A tablet has lately been set in the gable of a new building at Bowbridge, Leicester, commemorating the fact that the "crooked-backed tyrant" lies buried near the spot. The county was again much disturbed in the civil war between Charles I. and the Parliament. Leicester was captured by the king in 1645, and the decisive battle, which led to his dethronement and execution was fought a fortnight afterwards, on the borders of the county at Naseby, Northamptonshire.

The antiquities of the county are a tumulus at Radcliffe on the Wreak, 350 feet long, and 120 broad, attributed to the Celts; a remarkable parallel embankment near Leicester, locally called the Raw Dykes, and supposed to be the bounds of a British race-course; traces of the Roman roads, the Watling Street, the Via Devena, and the Fosseway; a Roman wall, called the Jewry Wall, at Leicester, built of alternate courses of ragstone and brick, and having several arches turned with tiles; tessellated pavements at Rothley and Wanlip; and remains of encampments, supposed to be Roman. Coins of the Roman emperors Titus, Trajan, Diocletian, Constantine, Constantius, Hadrian, and others, have been found at different times and places. The Gothic remains are those of the Abbey of Leicester, of the Nunnery of Grace Dieu, Ulvestoft Priory, Laund Priory, the castle of Ashby-de-la-Zouch, the churches of Hinckley and Melton-Mowbray, and the chapel of Market-Harborough.

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The pulpit and part of the vestments of the great reformer Wickliffe are still preserved in the church of Lutterworth, of which he was the pastor. He was buried there in the year 1387; but in 1428, by order of the Council of Sienna, his bones were taken up and burnt, and the ashes thrown into the river. Thus, to use the words of Fuller, "the Swift conveyed them to the Avon, the Avon into the Severn, the Severn into the narrow seas, and they into the wide ocean," foreshadowing the dispersion of the Bible, which he first translated into English, over the whole world.

The county is divided into 6 hundreds and 206 parishes. The population was, in 1821, 174,571; 1831, 197,000; 1841, 220,304; 1851, 234,938.

The chief towns are,—

	Population.		Population.
Ashby-de-la-Zouch	3,762	Lutterworth	2,446
Castle Donnington	2,729	Melton-Mowbray	4,391
Hinckley	6,111	Market-Harborough	2,325
Loughborough	10,900	Leicester	60,584

The amount assessed to the property and income tax within the county in 1851 was L.1,364,270.

The number of places of worship in the county in 1851 was 650, viz.,—Church of England, 289; other denominations, 361. The total attendance at the services in the morning, afternoon, and evening was,—Church of England, 157,982; other denominations, 147,802.

The number of day schools was 709, with 28,257 scholars, viz.,—Public schools, 278, with 19,392 scholars; private schools, 431, with 8862 scholars. Sunday schools, 432, with 36,280 scholars, viz.,—Church of England, 227 schools, 17,217 scholars; other denominations, 205 schools, 19,063 scholars. (F. C.)

LEIGH, EDWARD, a learned theological critic, was born at Shawell in Leicestershire, in 1602. After studying at Oxford, where he enrolled as a commoner of Magdalen Hall in 1616, he became a student of law in the Middle Temple. He then devoted himself to his professional duties and literature till 1636, when he entered parliament as member for Stafford. He became a colonel in the parliamentary army during the civil war, and soon afterwards a member of the Assembly of Divines. Being favourable to a reconciliation with the king, he was turned out of parliament along with the Presbyterian party in 1648. From this time, till his death in 1671, he was engaged in the study of theology, and published the following works:—*A Body of Divinity*, London, 1654; *Annotations on the Five Poetical Books of the Old Testament*, London, 1657; *Annotations upon all the New Testament*, London, 1650; *A Treatise of the Divine Promises*, London, 1633; *Critica Sacra*, his most important work, London, 1662; *A Treatise of Religion and Learning, and of Religious and Learned Men*, London, 1656.

LEIGH, a manufacturing and market-town of England, county of Lancaster, on the Wigan Canal, 12 miles W. of Manchester. It consists of two principal streets, from which several smaller ones diverge in different directions. The only public buildings are, an old parish church, the town-hall, and several chapels. The inhabitants are chiefly employed in the manufacture of cotton, silk goods, cambrics, muslins, and fustian, especially the two first. In the neighbourhood cheese and glue are made to some extent. The factories are plentifully supplied with coal and lime from the surrounding country, which abounds with these minerals. Market-day, Saturday. Two annual fairs are held here, where cattle and cheese form the staples of trade. Leigh has railway and canal communication with all the manufacturing and mining districts of Lancashire. Pop. (1851) 5206.

LEIGHTON, ROBERT, Archbishop of Glasgow, was born in the year 1611. His father, Alexander Leighton,

Leigh,
Edward
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Leighton.

a descendant of the ancient family of Ulyshaven in Forfarshire, commenced his academical studies at St Andrews, and afterwards repaired to Leyden, where he took the degree of M.D. Having fixed his residence as a medical practitioner in London, he met with strong opposition from the College of Physicians. In order to publish his *Sions Plea against the Prelacie*, he retired to Holland; and in 1629 became minister of the English church at Utrecht. But his conscientious scruples in regard to the observance of festivals, induced him to resign his charge within a few months. His book having been printed in the course of the preceding year, he returned to London. Two copies were presented to parliament two days before the dissolution; and he was immediately arrested by two pursuivants of the high commission, and conducted to the house of Laud, then Bishop of London, and inquisitor-general of England. On the bishop's warrant he was committed to a loathsome dungeon in Newgate, and only after fifteen weeks did the inquisitors permit his wife to visit him. In the interval his house had been ransacked and robbed by Laud's emissaries, who by their brutality so frightened one little boy of five years old, "that he never recovered it all his days." By flattering promises, one of Laud's agents prevailed upon him to confess that he was the writer of the book; but neither threats nor entreaties could induce him to betray any one of his friends and adherents. Before the court of Star-Chamber he repeated the admission, that he was the author of the book, but denied all criminality of intention. No counsel dared to plead his cause, and he returned to prison to await his doom. It was the opinion of four physicians that poison had been administered to him in Newgate. He had been seized with a violent distemper, which was accompanied with loathsome symptoms, and his strength was so completely exhausted that he could not be produced before this atrocious court. In his absence, he was sentenced (4th June 1630) to pay a fine of £10,000; it was also ordained that the high commission should degrade him from his ministry; that he should be brought to the pillory at Westminster, should be whipped, have one of his ears cut off, one side of his nose slit, and his face branded with the letters S. S., denoting a sower of sedition; that he should then be carried back to prison, and, after a few days, should again be pilloried at Cheapside, should then likewise be whipped, have his other ear cut off, and the other side of his nose slit; and should then be detained in close custody in the Fleet prison for the remainder of his life. When this sentence was pronounced, it has been stated that Laud pulled off his cap, and gave thanks to the God of mercy.¹ Before the execution of the sentence, Leighton made his escape from prison; and two of his countrymen, named Anderson and Elphinstone, were each fined £500 for aiding and abetting him in his flight. He was, however, retaken in Bedfordshire, and endured the first part of his punishment on the 26th of November; it was inflicted with the most unrelenting severity; the second part followed after a short interval; and thus miserably mutilated, he lingered in prison for nearly ten years.² In 1640 he presented a petition to the Long Parliament, reciting the direful persecution to which he had been subjected, and he now obtained such redress as could be afforded to him; "but," as Dr Benson has too truly re-

remarked, "no sufficient reparation in this world could possibly be made to a man so highly injured."³

Leighton.

ROBERT LEIGHTON, the eldest son of this learned and persecuted individual, is commonly represented as a native of Edinburgh; but as Burnet speaks of his father having sent him to be educated in Scotland, it has been inferred that he was born in London.⁴ He entered the University of Edinburgh in 1627; and, though even at that time remarkable for his piety, was censured for writing an epigram on the provost of the city. He made uncommon progress in his studies, and took the degree of A.M. in 1631. After he left the university he travelled on the Continent, and, among other places, visited Douay, where some of his relations were then residing. In France he spent several years. Returning to the land of his fathers, he became, on the 16th December 1641, Presbyterian minister of Newbattle, a parish within 7 miles of Edinburgh. He had now attained the age of thirty, and was qualified by his natural endowments, as well as by his acquired knowledge, to appear with singular advantage in his public capacity. His large and tolerant views, however, made him withdraw from the society of his brethren, and his retiring disposition caused himself seldom to let his voice be heard beyond the precincts of his parish. Bishop Burnet, who speaks with enthusiasm of Leighton's style of preaching, tells us that he had "a very low voice, and could not be heard by a crowd."

In 1648 Leighton declared in favour of the Engagement for the king, and thus exposed himself to the hazard of being subjected to heavy penalties. When some of his parishioners, who had been concerned in the unfortunate expedition to England, were enjoined to make a public profession of their repentance, he studiously avoided all mention of the grounds of the war, but admonished them that "they had been in an expedition in which, he believed, they had neglected their duty to God, and had been guilty of injustice and violence, of drunkenness, and other immoralities, and he charged them to repent of these very seriously." The Earl of Lothian, who resided in his parish, and entertained a high esteem for his character, had sufficient influence to protect him from any serious annoyance. It is, however, evident that he found himself placed in a very uncomfortable situation: and his uneasiness must in no small degree have been increased by the differences which unhappily ensued between the Resolutioners and Protesters. He was at length induced to resign the pastoral charge of Newbattle in 1652.

On the 17th January 1653, Leighton was elected principal of the University of Edinburgh, and was persuaded to accept an office for which he was so eminently qualified by his character, his talents, and his attainments. Being *ex officio* primarius professor of divinity, he often preached to the students in Latin, with such animation and purity of style as to draw crowded audiences. His conversation and piety had an equally good effect upon the youth under his charge. He also increased the temporal prosperity of the university, by soliciting and obtaining from Cromwell an annuity of £200 to increase its funds, which were then very low.

During the vacations, he made occasional excursions to England, and even to Flanders. He had an opportunity of observing the character of the eminent men who fre-

¹ Even in the solitude of his prison, Laud seems to have entertained a deliberate opinion that Dr Leighton's punishment had fallen short of his deserts. "In which book of his," he remarks very coolly, "were many things, which in some times might have cost him dearer" (*Hist. of the Troubles and Tryal of Laud*, vol. i., p. 198).

² Rushworth's *Historical Collections*, part ii., p. 58. Oldmixon's *Hist. of England during the Reigns of the House of Stuart*, p. 110. Pierce's *Vindication of the Dissenters*, p. 177; Neal's *Hist. of the Puritans*, vol. ii., p. 209, Toulmin's edit.; Brook's *Lives of the Puritans*, vol. ii., p. 476; Brodie's *Hist. of the British Empire*, vol. ii., p. 308.

³ Benson's *Brief Account of Archbishop Laud's cruel Treatment of Dr Leighton*, inserted in the third edition of his *Collection of Tracts*, p. 224, Lond., 1748, 8vo.

⁴ Murray's *Life of Robert Leighton, D.D., Archbishop of Glasgow*, p. 42, Edinb. 1828, 12mo.

Leighton. quented the Protector's court; but in his continental tours found more congenial society in the Jansenist divines, who seemed to be struggling for that primitive simplicity on which his own heart was set. At his restoration Charles II. tried to force Episcopacy upon Scotland, as he considered that form of church government most favourable to his despotic opinions. The politic apostate Sharp, the willing tool of the king, was appointed Archbishop of St Andrews and Primate of Scotland; and, chiefly at his recommendation, three bishops were nominated. One remained to be chosen, and Leighton was pointed out as a proper person. His brother, Sir Elisha Leighton, who had embraced Popery, and become secretary to the Duke of York, commended him to Lord Aubigny, and on account of his celibacy and ascetic mode of life, falsely represented him as fostering a secret favour for the Romish faith. At this nobleman's suggestion, Charles appointed Leighton one of the five bishops. Leighton, who was then in London, on his return from Bath, where he had been residing for the benefit of his health, was persuaded, after considerable difficulty, to accept of the bishopric of Dunblane, a small diocese, as well as a small revenue. He had previously cultivated an acquaintance with several Episcopalians, and, among others, with the father of Bishop Burnet. No person of ordinary candour can impute his change to any unworthy motive. Considering church government as a matter not determined by any positive injunctions, but open to the adjustment of bodies of men varying in their opinions, and placed in a variety of circumstances, he also cherished the hope (as he himself says) "of reconciling the devout on different sides."

Of the four bishops-elect, only two had received episcopal ordination; but before the consecration of the other two, Sharp and Leighton, it was considered as absolutely necessary to ordain them deacons and priests, since they could not be considered as really presbyters: an opinion which was by no means prevalent previous to the ascendancy of Laud, and which has since been ably refuted by Bishop Stillingfleet. To this idle ceremony of re-ordination, Sharp, who had "swallowed down greater matters," submitted with no small reluctance, but Leighton had good sense enough to know that it was a matter of no consequence whether he submitted to it or not. These two were privately ordained deacons and priests; and on the 15th of December 1661, all the four were publicly consecrated in Westminster Abbey. The good Bishop of Dunblane was scandalized at the feasting and jollity which followed this religious ceremony. They travelled towards Scotland in one coach; and Leighton stated to Burnet that he believed his associates were weary of him, for he was very weary of them. When he found that they intended to enter the metropolis with some degree of pomp, he left them at Morpeth, and saved himself from a triumphal entry by reaching Edinburgh a few days before them. When parliament assembled in the month of April 1662, most of the bishops took their seats, but Leighton did not appear among them; and he still retained enough of presbytery to refuse the title of *Lord*. With his new associates Leighton could mingle far less than with the intolerant presbytery of Newbattle; and as they carried their relentless schemes into his diocese, he quickly lost heart and hope. In 1665 he announced to the clergy of Dunblane his intention of resigning; and with a tale of sorrow, which moved even the heart of the king, he supplicated for leave to retire from his bishopric. The king, however, persuaded him to retain his office, promised the adoption of a more lenient policy, and suspended the functions of the ecclesiastical commission. But most of his Scottish ministers were so destitute of principle and humanity, that no material improvements ensued. The Presbyterians were subjected to intolerable grievances;

and at length, in 1666, had recourse to arms, when their military proceedings were very speedily terminated at the battle of Pentland Hills.

In the midst of these scenes of persecution, the gentle spirit of Leighton must have been heavily afflicted. He opposed all the violent methods of producing a formal compliance with the established mode of worship, and made great exertions to secure a general and permanent toleration. With this view he repaired to court in 1669, and had two audiences of the king. One of those who seconded his endeavours was Dr Wilkins, Bishop of Chester. The proclamation of indulgences complicated the politics of both parties, and for his zeal against the measure, Dr Alexander Burnet, Archbishop of Glasgow, found it expedient to retire to a private station, with the provision of an annual pension. It was not without much reluctance that Leighton was induced to accept of the vacant office; and, as his translation was attended with some informalities, he became, according to the strictness of ecclesiastical law, not archbishop, but administrator of the bishopric.¹ He removed to Glasgow in 1670, and in the course of the preceding year his friend Dr Gilbert Burnet had been elected professor of divinity in that university. They appear to have lived upon terms of great cordiality; and to Burnet, who became Bishop of Salisbury, we are indebted for a copious and most interesting record of his evangelical virtues.

Soon after his translation, he held a synod of his clergy, who uttered many complaints of being deserted by the people; but Leighton only exhorted them to lay aside all desire for revenge and to humble themselves before God. "This was a new strain to the clergy. So they went home, as little edified with their new bishop as he was with them." Accompanied by the professor of divinity, he afterwards visited some of the most eminent of the indulged ministers in different districts, with the view of persuading them to listen to terms of accommodation. In the presence of the Earls of Lauderdale, Rothes, Tweeddale, and Kincardine, he held a conference at Edinburgh with six of the Presbyterian clergy; but his arguments in favour of Episcopacy produced no effect upon those to whom they were addressed, and a second conference was attended with the same result. Leighton tried also to obtain some mitigation of the acts against conventicles. In reference to one of them, he declared to the Earl of Tweeddale, that the entire tenor of it was so contrary to the common rules of humanity, not to say Christianity, that he was ashamed to participate in the councils of those who could frame and pass such laws. Nor must it be forgotten that these atrocious laws were not suffered to continue a dead letter.

In the course of one year, four bishoprics became vacant, and the choice of them was offered to Dr Burnet. Leighton was authorized to recommend such individuals as he thought most worthy of promotion; but as neither Burnet, Charteris, nor Nairne, could be induced to undertake the office, he found himself beset with new discouragements. Having failed in his endeavours to conciliate the Presbyterians, being suspected and hated by the Episcopalians, and in utter despair of securing any benefit to others or satisfaction to himself, he repaired to London in 1672, and, not without considerable difficulty, obtained the king's permission to resign his preferment, after an interval of one year. He, however, retained it till the year 1674, and Alexander Burnet was then restored to his former dignity. After residing for some time within the precincts of the University of Edinburgh, Leighton retired to England, and spent the remainder of his life with his sister Sapphira, the wife, and finally the widow, of Mr Lightwater of Broadhurst, a demeane in the parish of Horsted Keynes, and county of Sussex. His time was chiefly spent in devout seclusion,

¹ Keith's *Catalogue of the Scottish Bishops*, p. 267, Russel's edit.; Pref. to Symson's *Life of Sharp*, p. xlviii.

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but he frequently officiated in the parish church, and in some others of that vicinity. In the year 1679, at the suggestion of the Duke of Monmouth, the king was induced to request that he would again fix his residence in Scotland, and use his endeavours in reconciling the ecclesiastical animosities which still prevailed in that country. But the Duke soon afterwards ceased to have any influence in the affairs of either kingdom, and this negotiation seems to have made no further progress.

In 1684 Leighton was urged by Dr Burnet to make a journey to London, for the purpose of meeting the Earl of Perth, Chancellor of Scotland, who had expressed an earnest wish to see him. When he reached the metropolis, Burnet was surprised to see him look so fresh and active at his advanced period of life: his hair was still black, and he retained much of his former vivacity, with the same quickness of conception and strength of memory. He, however, spoke of his work and journey being nearly finished at the same time; he was next day seized with a pleurisy; on the following day he suddenly fell into a state of insensibility, which continued for about twelve hours, when he expired, June 25, 1684, at an inn in Warwick Lane, in the seventy-fourth year of his age, ten years after he had ceased to be Archbishop of Glasgow. His remains were deposited at Horsted Keynes. A great portion of his income had been devoted to deeds of charity and benevolence; and by a will, dated on the 17th of February, he had destined the residue of his property to charitable uses. To his sister, and to her son, Edward Lightwater of Broadhurst, he only left a small token of grateful acknowledgement of the great kindness with which they had treated him while he was their guest. His library he bequeathed to the Cathedral of Dunblane, where it is still preserved.

The grave learning, piety, and charity of Leighton has been described by Bishop Burnet in very striking colours. His gentle nature was never ruffled with bursts of angry passion; and in those troublous times his loving spirit was never known to gratify itself in laughter, and very seldom was he even seen to smile. Of his indifference to fame we have a sufficient proof in the fact of his never having committed any of his works to the press.

The following is a list of his writings:—*Sermons*, Lond. 1692, 8vo; *Praelectiones Theologicae*, Lond. 1693, 4to. Of a very recent date, there is a more correct edition, published under the title of *Roberti Leighton, S. T. P. Archiepiscopi Glasguensis, Praelectiones Theologicae; Parmenses; et Meditationes in Psalmos* &c., *avarii, cæcæ, ethico-criticae. Editio nova, recensente Jacobo Scholefield, A.M. R.S.L.S. Græcarum Literarum apud Cantabrigienses Professore Regio, et Collegii SS. Trinitatis nuper Socio*, Cantabrigiæ, 1828, 8vo. An English translation of the prelections and exhortations had been published with the title of *Theological Lectures*, Lond. 1763, 8vo; *A Practical Commentary upon the First Epistle General of St Peter*, York and Lond. 1693-4, 2 vols. 4to; *An Exposition of the Creed, Lord's Prayer, and Ten Commandments; with two Discourses, on St Matth. xxii. 37, 38, 39, and Heb. viii. 10; to which is annexed a short Catechism*, Lond. 1701, 8vo; *Tracts, including Rules for a Holy Life, a Sermon, and a Catechism*, Lond. 1708, 12mo. After a considerable interval appeared *Select Works of Archbishop Leighton, some of which were never before printed; to which is prefixed an Account of the Author's Life and Character*, Edinb. 1746, 8vo. This publication was soon followed by *The Expository Works and other Remains of Archbishop Leighton, some of which were never before printed; revised by P. Doddridge, D.D., with a preface*, Edinb. 1748, 2 vols. 8vo. There are many other editions of a subsequent date, but among these we shall only specify that of Lond. 1825, 4 vols. 8vo, which has been reprinted several times, and contains a life of the author by the Rev. John Norman Pearson.

LEIGHTON-BUZZARD, a market-town of England, Bedfordshire, on the Grand Junction Canal, 40 miles N.W. of London by railway. Its streets are ill laid out, and the sewerage is defective. An elegant pentagonal cross, two storeys in height, and said to have been erected in the fourteenth century, stands in the market-place. The parish church, built in the early part of the thirteenth century,

has been so frequently repaired that it has in a great measure lost its original appearance of early English architecture. There are, besides, in the town a new town-hall, a literary institute, and several chapels, schools, and charities. The trade is partly dependent on straw-plaiting and lace-making, executed by the women; and partly on the cattle, horses, timber, and wool of the neighbourhood. Cattle are reared here in large numbers for London consumption. Market-day, Tuesday, chiefly for cattle; and five fairs take place during the year, the July one for wool exclusively. Pop. (1851) 4465.

LEINE, a river of N.W. Germany, rises in Eichsfeld, flows N. by W. through Prussian, Brunswick, and Hanoverian territories, receives on its right the Ruhme and Innerste, on its left the Kaspau, and joins the Aller (a tributary of the Weser) on the left, near Hudemühlen, after a course of about 130 miles. The chief town on its banks is Hanover, where the river becomes navigable.

LEINSTER, the most eastern province of Ireland, bounded by Ulster on the N.; by St George's, or the Irish Channel, on the E. and S.; and by the provinces of Connaught and Munster on the W. The capital city of this province and of the kingdom is Dublin. It contains twelve counties, viz., Carlow, Dublin, Kildare, Kilkenny, King's County, Longford, Louth, Meath, Queen's County, West Meath, Wexford, and Wicklow. It comprises an area of 4,876,211 acres, being, therefore, with the exception of Connaught, the smallest province of Ireland. The general elevation of its surface is also less than that of the other provinces, excepting Connaught.

LEIPSIC, or more correctly LEIPZIG, one of the four circles into which Saxony is divided, comprises the N.W. part of that kingdom, and is bounded on the N. and W. by Prussia, S. by Saxe-Altenburg and the circle of Zwickau, and E. by the circle of Dresden. Area, 1336 square miles. The country is generally level, and lies lower than any other part of Saxony. It is most elevated in the S., where some offsets of the Erzgebirge appear, but do not attain any great height. Leipsic belongs to the basin of the Elbe, and is principally drained by its tributaries the Elster and Mulda. The soil is fertile, and in general well cultivated. The principal crop is corn. The rearing of cattle, and especially of sheep of a superior breed, is much attended to. Tobacco is extensively grown. There are no metals; but limestone, marble, potters' clay, fullers' earth, and peat are abundant in various parts. The manufactures in this circle are flourishing, and include woollen, cotton, and linen goods, and earthenware. Pop. (1855) 454,262.

LEIPSIC, or *Leipzig*, the capital of the above circle, and the second city in the kingdom, is situate in an extensive and fertile plain, on the White Elster, here joined by the Pleisse and Parde, 72 miles W.N.W. of Dresden by railway. The fortifications which formerly surrounded the town have been converted into beautiful walks and gardens. The houses are chiefly old-fashioned stately buildings, frequently six storeys in height, besides three or four additional ones in the pyramidal roof, and exhibiting much carved masonry. The streets are narrow, and from the height of the houses, have rather a dingy appearance, but are well paved and clean. The suburbs, however, of which there are four, are of recent date, and more regularly built. In the centre of the town is the great market-place or square, which has a very picturesque appearance from the quaint architecture of buildings which surround it. One of these is the town-house, built in 1556, where the allied sovereigns met to congratulate each other after the battle of Leipsic. Here, too, is the *Königshaus*, formerly a residence of the electors and kings of Saxony, and occupied by Napoleon during the battle of Leipsic. Near this is Auerbach's Cellar,

Leine
||
Leipsic.

Leiria. a spirit-vault said to have been frequented by Dr Faust, and here Goethe has laid a scene of his celebrated tragedy. The poet, not less than his hero, is said to have frequented this place when a student. The old castle of Pleissenburg, which, during the Thirty Years' War, withstood the attacks of Tilly for several weeks after the town had surrendered, stands in the S.E. part of the town. The lower part of it is now used as a wool warehouse, and the tower as an observatory. Several of the churches are handsome buildings, as those of St Nicholas, St Thomas, and St Paul. Among the other public buildings are the university, cloth hall, booksellers' exchange, post-office, and theatre. The University of Leipsic, founded in 1409, is one of the first in Germany. In 1853-4 it had 113 professors and teachers, and 807 students. Besides faculties of theology, law, medicine, and philosophy, it has a library of 150,000 volumes, and 2000 MSS., an anatomical theatre, clinical institution, botanical garden, observatory, chemical laboratory, museums, &c. The *Augusteum*, a very elegant building connected with the university, was erected in 1836, and named after King Frederick Augustus. It is three storeys in height, and contains the library, lecture-rooms, &c. In the *Paulinum*, another elegant building, are the museums of natural history and anatomy. This university is rich in endowments for stipends to scholars. Leipsic is well supplied with other educational and literary institutions. It is connected by railways with Dresden, Magdeburg, Berlin, and Altenburg, and is the centre of a very extensive trade. The celebrated Leipsic fairs are held here thrice a year,—on the 1st of January, at Easter, and at Michaelmas. They usually last for three weeks, and are attended by merchants from all parts of Germany, England, France, America, Russia, Italy, Greece, Turkey, Persia, &c. The goods comprise all kinds of woollen, linen, and cotton stuffs, silks, lace, hardware, jewellery, watches, toys, paper, books, leather, &c. The value of the goods brought to these fairs in 1855 was estimated at about £11,000,000 sterling. On these occasions the town presents the greatest bustle and confusion—the streets and squares are occupied by temporary booths in addition to the ordinary shops, while the population of the town is nearly doubled. The Easter and Michaelmas fairs, particularly the former, are famous for the vast number of new publications brought there for sale. The Easter fair is attended by booksellers from all parts of Germany, and even from other countries, sometimes to the number of 600. Prospectuses and specimens of new publications are brought here for circulation, annual accounts are settled, and purchases made. In the Easter fair catalogue for 1856 the number of new works announced as published in Germany during the preceding year was 9540, as forthcoming 1171. Leipsic is also of considerable importance as a manufacturing town. It has large type-foundries, oil-mills, paper-mills, and manufactories of silken goods, stockings, leather, hats, hardware, musical, optical, and mathematical instruments. There are about 150 publishing establishments in the town; and in 1853 there were 36 printing offices, with 58 steam, and 164 hand presses. Leipsic was the scene of a tremendous conflict on the 16th, 17th, and 18th of October 1813, between the allies under Prince Schwartzenberg, and the French under Napoleon, in which the latter were totally defeated. See HISTORY OF FRANCE. Pop. (1855) 69,986.

LEIRIA, a town of Portugal, capital of a cognominal administration, in Estremadura, is situate in a fertile valley on the right bank of the Liz, at its junction with the Lena, 75 miles N. by E. of Lisbon, and 15 miles from the Atlantic. An old castle, founded in the twelfth century, occupies a commanding position on a rock in the centre of the town. Leiria is the see of a bishop, and contains a cathedral of comparatively modern date, several churches and convents, besides a college, an hospital, and small

theatre. The chief articles of trade are glass and fine timber, the former being manufactured largely in the adjacent village of Marinha, while the latter is brought from the extensive forests in the neighbourhood. There are some warm and medicinal springs near the town. At Leiria, in 1466, the first printing-press in the Peninsula was set in motion. The poet Rodriguez Lobo was born here about the middle of the sixteenth century. In July 1808, the town was seized by the French under General Margarot, after a feeble resistance, and many atrocities committed. Pop. about 3000.

LEITH, although an independent burgh, may be considered the seaport of Edinburgh, from which it is only about a mile and a half distant. The Water of Leith, at its confluence with the Firth of Forth, divides the town into two parts, called respectively, North and South Leith. The first mention made of Leith is in the charter of erection of Holyrood Abbey, founded by David I. in 1128, where it is styled Inverleith. The magistrates of Edinburgh obtained a grant of the harbour and mills from Robert I. in 1329, and they subsequently purchased, from Logan of Restalrig, all the other rights and privileges. Its municipal government and admiralty jurisdiction continued in their hands until the year 1833, when the Burgh Reform Act conferred on Leith the right of electing its own magistrates, and the management of its own municipal affairs.

From the earliest times down to a recent period there existed a petty rivalry between the inhabitants of Leith and Edinburgh, an evidence of which was given so early as the year 1485, when the magistrates of Edinburgh, to prevent the citizens of Leith competing with them in trade, passed an act ordaining that no merchant of Edinburgh should presume to take into partnership an inhabitant of Leith under the penalty of 40 shillings Scots, and the loss of the freedom of the city. The civil and political history of Leith is thus so united with that of the metropolis that most of the leading events are described in the account of the latter. Its importance as the principal channel for the admission of troops and supplies made the possession of it an object with the conflicting parties during the turbulent period of the Reformation, and the subsequent contests for ascendancy between the supporters and enemies of the Stuart family.

As Edinburgh was the stronghold of the Protestant party, Leith was that of the Roman Catholic party, who, headed by Mary of Guise, then Regent of Scotland, and assisted by a body of French soldiers, sustained within it, in the year 1560, a siege of two months.

The modern streets of Leith are spacious and well built, but the older ones are irregular and contracted. The principal buildings are the Exchange, the Custom-house, the Town-house, the church of South Leith (one of the few ancient Gothic buildings now used in Scotland for public worship), and the Forts, one of the military stations of the United Kingdom for a small body of artillery.

The chief manufactures of Leith are ropes, sailcloth, locomotive engines and machinery, glass, soap, ale, refined sugar, and oil seed cakes. Iron and timber ship-building is also carried on to a considerable extent.

Various efforts have from time to time been made to overcome the natural obstacles that lay in the way of Leith as a shipping port. In 1720 a dock was formed on the E. side of the river, and in 1777 a small quay called the Custom-house quay was built. Between 1800 and 1817, two wet docks were constructed, each measuring 750 feet in length by 300 in width, and having a united area of about 10 acres. In 1831 two great additional works were undertaken, viz., an addition to the old or E. pier of 500 yards, and the formation of a covering bulwark, by means of which the water in the channel was deepened about two feet. There were still, however, only 17 feet of water over the bar at its mouth at high-water spring tides, and no vessel

Leith.

Leith. of above 400 tons could enter the harbour without lightening. Farther improvements were commenced in 1848, and completed in 1855. These included the formation of the Victoria Dock, equal in extent to either of the others; the new western pier and low-water landing slip; the extension of the eastern pier 1000 feet seaward. The length of the E. pier is now 3530 feet, and of the W. 3123 feet. They are unsurpassed by any in the kingdom; and, in addition to other important purposes, afford the means of a healthful and pleasant promenade. By means of these improvements, a depth of 26 feet water has been obtained in the new harbour at high-water spring, and of 21 feet at neap, tides. The Victoria Dock has 25 feet water at spring, and 20 feet at neap, tides, upon the gate sill, and two feet more within the dock; and the two old docks have 18 feet at spring, and 13 feet at neap, tides. Vessels of upwards of 2000 tons burden, of 320 feet in length and 58 feet in breadth, can be accommodated in the Victoria Dock.

There are also five dry or graving docks at Leith, of the following dimensions:—

No. of Docks.	Length		Width			Depth of water over dock sills at high-water spring tides.
	O	At top.	Of floor.	At top.	Of gates.	
	ft. in.	ft. in.	ft. in.	ft. in.	ft. in.	
2	160 0	174 0	45 0	70 6	36 0	16 6
1	173 0	177 0	32 0	58 0	36 0	13 8
1	166 0	172 0	36 9	49 6	30 9	12 5
1	117 6	121 6	41 0	51 0	33 9	12 6

A new graving dock of greater capacity is proposed to be made on the E. sands, and to enter the present new harbour a little to the N. of the entrance to Victoria Dock. The following are its proposed dimensions. Length of floor 300 feet, at top 330 feet; width of floor 45 feet, at top, 80 feet; of caisson, 72 feet; depth of water over sills at high-water springs, 24 feet 5 inches.

Besides having regular steam communication with Rotterdam, Hamburg, Hull, London, Newcastle, and the north of Scotland, Leith trades largely with the Baltic, Mediterranean, North America, and Australia. The exports are principally coal, iron, spirits, ale, paper, linen yarn, &c. Of coal and iron the quantities exported during the last three years were as follows:—

EXPORTS.			
DATES.		Coals.	Pig-iron.
		Tons.	Tons.
15th May 1853 to 15th May 1854		29,773	24,072
... 1854 ... 1855	1855	35,093	33,094
... 1855 ... 1856	1856	30,898	29,220
			2352

The principal import is grain, of which the quantity imported during the last three years is given in the following table. After grain and timber the chief articles of import are hemp, flax, wool, linseed, oilcakes, guano, agricultural seeds, butter, cheese, fruit, corkwood, wines, spirits, oil, sugar, tea, &c. :—

IMPORTS.							
DATES.	Wheat.	Barley.	Oats, &c.	Flour.	Timber from		Guano.
					Baltic & other ports.	North America.	
	Qrs.	Qrs.	Qrs.	Bags and Barrels.	Loads.	Loads.	Tons.
15th May 1853 to 15th May 1854.....	277,256	89,541	86,203	30,637	36,350	10,547	14,183
... 1854 ... 1855.....	271,917	105,731	94,427	46,898	19,539	15,234	14,294
... 1855 ... 1856.....	254,006	149,970	106,524	35,700	25,544	13,089	14,861

Number and Tonnage of Vessels Arriving at Leith.

DATES.	British Sailing Vessels.		British Steam Vessels.		Foreign Vessels.		Total.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
15th May 1853 to 15th May 1854.....	3406	192,936	643	89,111	863	87,452	4912	369,499
... 1854 ... 1855.....	3314	193,431	626	86,052	816	78,481	4756	357,964
... 1855 ... 1856.....	3289	194,739	630	88,064 ¹	774	81,138	4693	363,941

Number and Tonnage of Vessels Sailing from Leith.

DATES.	British Sailing Vessels.		British Steam Vessels.		Foreign Vessels.		Total.	
	No.	Tons.	No.	Tons.	No.	Tons.	No.	Tons.
15th May 1853 to 15th May 1854.....	3410	191,300	630	87,504	842	85,218	4882	364,022
... 1854 ... 1855.....	3316	194,284	625	85,899	778	73,486	4719	353,669
... 1855 ... 1856.....	3303	195,227	628	87,663	842	88,585	4773	371,475

The amount of customs duties received at Leith for the last four years were,—1853, L.485,915; 1854, L.455,403; 1855, L.462,917; and 1856, L.498,172. The vessels registered as belonging to the port on 31st December 1855, were,—sailing vessels, of and under 50 tons, 71; tonnage, 2218: above 50 tons, 80; tonnage, 17,058;—steam vessels, of and under 50 tons, 14; tonnage, 289: above 50 tons, 23;

tonnage, 6654. The recent war with Russia has checked the increase in the trade that would otherwise have resulted from the greatly enlarged accommodation.

Leith is governed by a provost, 4 bailies, and 10 councillors; and unites with Portobello and Musselburgh in returning a member to Parliament. Pop. (1851) 30,919; constituency, 1375.

¹ The increase would have been much greater had not most of the Leith steamers being employed as transports. Since the peace the increase has been very decided. During the seven months ending 31st December 1856, 565 steam vessels, of 81,090 tons, entered; and 558, of 78,727 tons, left the port.

Leitmeritz
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Leitrim.

LEITMERITZ, a town of Austria, capital of a cognominal circle in Bohemia, on the right bank of the Elbe, here crossed by a long bridge, and on the Prague and Dresden Railway, 48 miles N. by W. of the former, and 69 S. by E. of the latter. It is the see of a bishop, and contains a cathedral of the eleventh century, a town-house, hospital, a college, and a theological school. Coach-building, and the making of straw hats and musical instruments, are carried on. It has also a brisk trade in the wine and grain of its fertile neighbourhood. Pop. 7100.

LEITRIM, a county of the province of Connaught, in Ireland, bounded N. by the bay and the county of Donegal, E. by the counties of Fermanagh and Cavan, S. by those of Longford and Roscommon, and W. by Roscommon and Sligo. Its only claim to be considered a maritime county is the possession of 3 miles of coast on the Bay of Donegal. In shape it has been compared to an hour-glass, broad at both ends, and contracted in the centre. Its greatest length, measured from S.E. to N.W., is 52 miles; its breadth where broadest is 20, and where narrowest not more than 7 miles; extending over an area of 613 square miles, or 392,363 acres, of which 249,350 are arable, 115,869 uncultivated, 3396 in plantations, and 23,748 are under water. Of the 116,000 acres of uncultivated land, 55,500 are coarse pasture above 800 feet over sea level, 60,500 coarse pasture below 800 feet, including flow bogs, &c.; 30,000 are improveable for cultivation, 36,000 improveable for pasture, and 50,000 acres are incapable of improvement.

The county, which derives its name from an ancient but now obscure village on the Shannon, is supposed to have formed part of the region inhabited by the tribe of the Nagnatæ in the time of Ptolemy. The Irish chroniclers distinguish it by the name of Hy-Brune-Brefine, or Brennie. The family of O'Rourk, which derived its descent from Roderic, King of Ireland, held in it the rank of chieftains; and under them were the O'Murreys, M'Loughlins, M'Glanchies, and M'Granells. It was made shire-ground, together with the other counties in Connaught, during the reign of Queen Elizabeth; and is now divided into the five baronies of Carrigallen, Dromahaire, Leitrim, Mohill, and Rosclogher. These baronies are subdivided into seventeen parishes, of which ten are in the diocese of Kilmore, and seven in that of Ardagh. The county is in the Connaught circuit, and the assizes are held at Carrick-on-Shannon, which is the station of the county inspector of constabulary. For poor-law purposes, Leitrim is divided into the unions of Manor-Hamilton, Mohill, and Carrick-on-Shannon, and small portions are included in the neighbouring unions of Bawnboy and Ballyshannon.

The climate is not only colder than the more southern counties, but also more moist, owing to the number and height of the mountains with which the greater part of its surface is overspread. The whole of the northern part of the county is mountainous. Lugnaculeagh, the most elevated of the mountains, rises to the height of 1485 feet; Benbo is 1365 feet high; Lacka, 1315; the Green Mountain, 950 feet. More southerly are Slieve-an-Ierin and Bencroi. Large tracts of ground comparatively level are to be found in the southern part of the county, the greater part of which is well wooded, fertile, and abounding in picturesque scenery. The soil in general is stiff, heavy, cold, and wet. The tops and sides of most of the hills are covered with a thin ferruginous loam, based upon a hard gravel. The valleys, which are in general well watered, are of a quality superior to the hills, deeper in mould, and much more fertile. The more level tracts, already noticed, are a dark rich soil on a limestone bottom.

The county is not more remarkable for its mountains than for its lakes. The principal is Lough Allen, situate in its centre, where narrowest. It is 8 miles long from N.

to S., and 4 where broadest, and may be looked upon as the great reservoir and distributor of all the running water in the county, and the embryo feeder of every canal that may be made to traverse it. Squalls on this lake are violent, and render boating on it hazardous. Lough Allen is not in itself an interesting, or beautiful, or picturesque lake; neither is the scenery on its banks sufficiently bold to make the smallest approach to grandeur; it is merely wild and solitary. It is embosomed in hills of moderate elevation, not picturesque in their outline, nor clothed with wood, and contains a few islets. A few miles to the N. is Lough Clean, or Belhovel Lake, which covers an area of 345 acres, and discharges its waters into Lough Allen by a stream of some magnitude. Several smaller sheets of water are scattered throughout the southern baronies. On the borders are Lough Gill, Lough Melvyn, Lough Cane, and Lough Boffin. The source of the Shannon is a matter of doubt among the local topographers; by some it is placed in the recesses of the Leitrim Hills, where it is said to spring with nearly its full power from a vast gulf, the depth of which has not yet been ascertained; and almost immediately expanding, forms Lough Allen, of which the area is 8900 acres. Issuing from the southern extremity of Lough Allen, this noble river, which is here but 146 feet above the level of the sea, forms the western boundary of the county. The Bonnet rises near Lough Clean, and after a course of about 15 miles through picturesque scenery, falls into Lough Gilly. The small rivers, Bundrows and Brinduff, which separate Leitrim from Donegal and Sligo, contain between their mouths the scanty line of sea-coast belonging to the county. Many other streams, too small to be particularly noticed, and discharging themselves into some of the numerous lakes or larger rivers, afford a copious and perennial supply of water.

The central parts of the county form part of the great Connaught coalfield, which occupies also large portions of the counties of Roscommon, Sligo, and a part of Cavan in Ulster. Before a committee of the House of Commons, Mr Griffith stated that there are three beds of coal in the Lough Allen district, the upper 9 inches, the second 3 feet, and the third also 3 feet. The quality of the coal is not so good as that of either Whitehaven or Newcastle; it is a kind of medium between the open burning, or quick blazing coal of Scotland, and the caking coal of Whitehaven, and is very good for culinary and manufacturing purposes. The principal vein in this county is in Bencroi Mountain, the summit of which is bog. Iron-ore abounds in the Slieve-an-Ierin, or Iron Mountain, so called from the stores of this valuable metal which it contains. On its northern side, where its flanks have been torn by winter torrents, the metal shows itself in considerable quantities, imbedded in strata of limestone. Alternations of shale and sandstone, containing beds of coal, succeed on this and other mountains of sufficient altitude; for it would appear that such a formation had originally extended over the entire district, and that the absence of those members from the lower mountains has been owing to their removal by some abrading and denuding force. At present they remain only on the summits of Slieve-an-Ierin, Lugnaculeagh, Lackagh, and the highest part of the Munterkenny range; and the occurrence of coal in lumps through the sandstone, gravel, and blue clay hills of the south and south-eastern parts of the county, confirms the supposition that a portion of the coal formation has been removed, and points to the N.W. as the direction from which the denuding agent must have proceeded.

The ore in this county is considered as richer than that found in the Arigna valley in Roscommon. It was at one time attempted to be worked, but the failure of timber, and the want of a regular supply of mineral coal, put a stop to the operations. Indications of the same ore are to be found

Leitrim.

Leitrim. in several other parts of the mountainous district, and even in the interior of the plain country, near the Shannon. Lead has been found near Lurganboy. Upon the N. side of Benbo Mountain are pits whence copper has been extracted. Manganese is also found in considerable quantities, as is pipe-clay, yellow ochre, white and brown chalks, clays of various hues, and sand suited for the manufacture of glass. The substratum of the parts of the county N. and S. of the coal and iron district is chiefly limestone, interspersed occasionally with sandstone. Benbo is granitic. The quantity of bog is estimated to occupy 7234 acres. Its general depth is 30 feet, and it rests on a stratum of marl or blue clay. The highest level of any of the bogs above the Shannon at Lough Reagh is 114 feet, that of the lowest 29. All are so far elevated as to admit of drainage. There is a sulphureous spa at Drumsna, formerly in high repute for cutaneous disorders, and considered more effective than that of Swanlinbar. There are also others of the same quality at Annaghduff, Meelock, and Attymanus, and in some other places. Cavan Spa is a chalybeate, issuing from the southern part of a peninsula in the N. of Lough Allen. Oakfield Spa, likewise chalybeate, is near the sea. Both are visited for their supposed sanative qualities.

The population, like that of every other part of Ireland, was progressively on the increase ever since any series of systematic observations have been directed to ascertain it, until the last decennial period. The following are the most authentic statements :—

1760.....	De Burgho	26,142
1792.....	Beaufort.....	50,000
1813.....	Parliamentary census.....	94,095
1821.....	Ditto.....	124,785
1831.....	Ditto.....	141,524
1841.....	Ditto.....	155,297
1851.....	Ditto.....	111,841

It appears, therefore, that between 1841 and 1851 the population of Leitrim decreased 28 per cent., or 8 per cent. more than the decrease which took place in the whole of Ireland.

This population was represented in the Irish House of Commons by six members,—two for the county at large, and two for each of the close boroughs of Carrick-on-Shannon and Jamestown. At the Union the boroughs were disfranchised, and compensation to the amount of L.15,000 awarded to the Earl of Leitrim for Carrick-on-Shannon, or, as it was then called, Carrick-Drumrushe; and for Jamestown, L.7500; to Gilbert King, Esq., and to the Rev. John King, archdeacon of Killala, and the sovereign and burgesses of the burgh of Jamestown, L.7500. Since the Union no change has been made in the number of representatives, and the county now sends but two members to the imperial parliament.

The state of public education, as collected from the parliamentary inquiries in 1821 and 1824–26, may be inferred from the following table :—

Year.	Boys.	Girls.	Sex not ascertained.	Total.
1821.....	3580	1609	...	5,189
1824–6.....	6736	3627	772	11,135

Of the numbers in the latter of these returns, 2147 were of the Established church, 27 were Dissenters, 7757 Roman Catholics, and 1204 whose religious persuasion could not be ascertained. The total number of schools was 242, of which twenty-one, educating 1181 pupils, were maintained by grants of public money; sixty-four, educating 3113, derived their support from private contributions; and the remaining 157 schools, educating 6841 pupils, were supported wholly by the fees of those who received instruction in them.

The number of pupils attending each description of school,

in 1851, was ascertained, by the Census Commissioners, to have been :—

SCHOOLS.	No. of Schools.	Number of Children.		
		Males.	Females.	Total.
National.....	93	2,449	2,024	4,473
Church Education.....	17	295	254	549
Private	52	731	535	1,266
Free	4	41	114	155
Mission	6	41	102	143
Workhouse	4	453	622	1,075
Gaol	1	67	...	67
Total	177	4,077	3,651	7,728

These numbers state the average attendance of pupils during one week; but from the family returns it appears, that the number actually receiving instruction was 12,303; i.e., 6423 males, and 5780 females. The condition of the entire population of the county, above five years of age, as regards rudimentary education, in 1851, was ascertained to be as follows :—

Degrees of Education.	Males.	Females.	Total.
Who could read and write	18,460	8,940	27,400
Who could read only	9,225	11,395	20,620
Who could neither read nor write	22,537	29,558	52,095

The quantity of land under tillage is small, and the plough little used, excepting in the champaign districts. In the other parts the mode of culture is still, to some extent, by the loy, a narrow spade with a long handle. The hills are generally steep, and, though abounding with stones, are tough, and retentive of moisture. The loy penetrates into this species of soil more easily than the common broad spade, and the length of its handle serves as a lever to overcome the resistance of the tenacious soil. Potatoes are planted with a steveen, which is a stake about four feet long and three inches in diameter, tapering to a point at the lower end, near which a cross piece is fixed to rest the foot on whilst pressing the implement into the ground. The seed is dropped into the hole thus made, which is then filled up with mould. Oats are the general crop; barley is but little grown; rye and wheat still less. Flax forms a part of the usual rotation of crops. There are about 14,400 holdings above one acre in extent, and of this number more than 11,500 contain less than 30 acres. There are also about 500 cottiers, or persons holding less than one acre of land.

The extent of land under crops, and the number of acres under each species of crop, in 1854, 1855, and 1856, was as follows :—

CROPS.	1854.	1855.	1856.
Wheat	293	291	396
Oats	26,959	28,780	27,970
Barley, Bere, Rye, Beans, and Pease	323	587	581
Potatoes	23,666	23,537	25,102
Turnips	988	1,075	871
Other green crops	1,626	1,193	1,515
Flax	1,022	718	680
Meadow and clover	27,748	28,598	28,385
Total extent under crops	82,625	84,779	85,500

Tillage farms are small; those for grazing are of considerable size, and are sometimes held by several tenants in common. The grasses are mostly natural, and in general excellent, producing fat and well-flavoured meat, and excellent milk and butter. Dairies of large size are seldom to

Leitrim. be met with, but every small farmer produces butter to dispose of at some of the neighbouring markets. Green food is seldom used. The cattle are housed in some parts from December to May, whilst in others they are left out during the winter.

The quantity of each of the chief descriptions of live stock in the county, in 1854, 1855, and 1856, was:—

Live Stock.	1854.	1855.	1856.
Number of Horses	3,486	3,759	3,838
Cattle	89,102	91,061	89,950
Sheep	19,047	20,578	20,744
Pigs	27,909	20,790	14,704

The usual fence is a drain, backed at one side with a bank of clammy aluminous earth, 3 or 4 feet high. The ditch thus made soon hardens into a consistency nearly equal to brick, and answers every purpose of fencing, except against sheep, in which case it is topped with brushwood. Stone walls are few. Hawthorn hedges are to be met with in some parts. Manures are rich and abundant. Every part has a command of limestone, either solid, or in gravel or marl. The farmers living upon the confined verge of sea-coast within the county industriously take advantage of the sea-weeds, shells, and gravel found there. Much attention is paid to the collection of every kind of manure. The farm-houses are generally long, narrow buildings, of one storey high, with a yard before them, of which the offices form the sides. The repairs are usually made by the landlord, a custom very uncommon in other counties. Leases are generally for three lives, or thirty-one years. Non-alienation clauses are common, and the tenant is sometimes bound down to manure a certain portion of the land.

The manufactures are confined to that of coarse linen, the weaving of which is carried on to some extent. Manufactories of coarse pottery exist about Leitrim and Dromahaire. The only navigable river by which an inland trade can be carried on is the Shannon, the navigation of which, consisting of a series of lakes, short canals, and the magnificent river itself, forms a water communication from Lough Allen to Limerick, and to Dublin by its connection with the Royal Canal at Tarmonbarry. "The proposed most important line of inland navigation which would connect the Ulster Canal and Lough Erne with the Shannon at Leitrim has not been undertaken. The importance of this connection may be estimated by a glance at the map, when it will be seen that the network of inland navigation of the N.E. of Ireland, is separated from the water communications of the S. and centre by the tract which this canal would intersect, and that, consequently, the two systems of traffic, now isolated, would by it be placed in connection. Limerick would thus come into direct communication with Enniskillen and Ballyshannon, on the western, and with Belfast on the eastern coast of Ulster, and a total line of 716 miles of inland navigation be opened out." (*Industrial Resources of Ireland*, by Sir Robert Kane.)

The general food of the peasantry is potatoes and oaten bread, with butter and eggs occasionally, and flesh meat at the great festivals. The clothing is neat, clean, and substantial; the coat usually of native frieze, and the waistcoat and breeches of corduroy. In their general demeanour the peasantry are kind and warm-hearted. They are, like those of most other parts of Ireland, singularly attached to peculiar places of interment. One of the most frequented of these is on a small island near the entrance of the Shannon into Lough Allen, where are the remains of a church. It has been from time immemorial the burying-place for the residents in all the surrounding country; and when access to it is prevented by the stormy state of the lake, the friends of the deceased remain on shore by the putrefying corpse, until the weather become favourable, rather than remove it

for interment elsewhere. The frequent occurrence of fatal accidents in these funeral voyages induced a neighbouring gentleman to have a piece of ground upon the adjoining mainland consecrated as a cemetery, but to no purpose. The survivors preferred awaiting all chances of weather rather than relinquish the idea of depositing the bones of their departed friend with those of his forefathers. The mountainous districts are thickly peopled, but have few resident proprietors. The lowest classes there speak Irish, a language which is understood by about thirteen per cent. of the entire population of the county. The vicinity of the three counties of Leitrim, Cavan, and Sligo to each other formerly gave frequent occasion to party feuds between hostile clans or factions, that seldom terminated without bloodshed, and not unfrequently with loss of life.

There are but few remains of ancient Irish antiquities in this county. The most remarkable are two druidical altars; one very large near Fenagh, the other of smaller dimensions at Letterfyan. They are called by the natives Leaba Dearmud is Graine, or Darby's and Graine's bed. The principal monastic buildings, of which any vestiges can now be traced, are the following:—Creevelea, near the River Bonnet, built by Margaret, widow of O'Rourke, in 1509. The walls, which are nearly entire, have on them some curious figures, and contain several antique monuments. Fionagh, in Fenagh parish, still exhibits a window of fine workmanship; the place was anciently celebrated as a school of divinity, and was resorted to by students from many parts of Europe. A Franciscan friary, at Jamestown, was remarkable, in the eventful period of 1641, as being the place where the Roman Catholic clergy assembled, and nominated commissioners to treat with such foreign powers as were willing to assist them in their struggle against the English government. Clone, near a small river of the same name in Mohill barony, has still some ruins to point out its site. Mohill Abbey, Anaghduff, and Drumleas, have been converted into parish churches. Some others are known only by name. Amongst the military antiquities may be noticed O'Rourke's Hall, at Dromahaire, near the Bonnet, the destruction of which was expedited by using its materials for the construction of the neighbouring castle of Dromahaire, supposed to have been built by Sir William Villiers in the year 1628. Other castles, built by various members of the O'Rourke family, are those of Longfield, Cloncorrick, Castle Cor, and one on the banks of Lough Gill. Woodford House is built on the site of another of the O'Rourks' castles. Manor-Hamilton Castle, built by Sir Frederick Hamilton in 1641, but now in ruins, was by much the largest, best built, and handsomest in the county. Castle John stands on an island in the little lake called Lough Scur. Dunganbuy Castle, near the sea, is of the era of Elizabeth.

The population of Leitrim may be said to be wholly rural: no town in it contains 2000 inhabitants. Carrick-on-Shannon, the county town, where the assizes are held, and all the public business transacted, contains no more than 1366 inhabitants. Though well circumstanced for inland trade, from its situation on a fine navigable river, no advantage is derived from its position. Its only public buildings are a court-house, a jail, a chapel of ease, and a barrack. The mail-coach road to Sligo passes through it. The only other towns whose population exceeds 1000 souls are, Mohill, which contains 1223, and Manor-Hamilton, which has 1227 inhabitants. (H. S.—R.)

LEIXLIP, a post and fair town of Ireland, pleasantly situate on the River Liffey, in the county of Kildare, about ten miles from Dublin. Near it are the ruins of the church and castle of Confy. The castle of Leixlip is beautifully situate on the banks of the Liffey. In the immediate neighbourhood is situate the well-known waterfall, called the *Salmon Leap*, which consists of a succession of rocky ledges, on the Liffey, over which the fish dart at one bound. A

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mile from this is Castletown, the magnificent seat of Mr Conolly.

LELAND, JOHN, a famous English antiquary, was born in London, towards the close of the reign of Henry VII. An orphan at a very early age, he was befriended by a Mr Thomas Myles, who placed him at St Paul's School, under Lily, the famous grammarian. He studied first at Christ's College, Cambridge; and a few years afterwards at All Souls' College, Oxford. After residing for some time in Paris, to increase his acquaintance with Latin and Greek, and to acquire French, Italian, and Spanish, he returned to England, and, entering into holy orders, became chaplain to Henry VIII., who appointed him, in 1530, to the rectory of Popeling, in the marches of Calais, made him his librarian, and in 1533 honoured him with the title of the king's antiquary. By a commission given along with this title, he was empowered to search for all records, manuscripts, and relics of antiquity, in the cathedrals, colleges, abbeys, and priories throughout England. Accordingly, being allowed by a special dispensation to supply his place at Popeling with a curate, he set out on a tour which lasted six years, and afforded him ample and varied materials for study during the remainder of his life. On his return in 1542, he was rewarded by the king with the rectory of Haseley in Oxfordshire; in 1543 he was presented to a canonry in King's College (now Christ's Church), Cambridge, and about the same time to the prebend of East and West Knowle in the Cathedral of Sarum. Leland now withdrew to his house in the parish of St Michael le Querne, London, and devoted himself exclusively to the digesting of his information. Shortly after the death of Henry VIII. in 1547, he fell into a state of insanity, which continued until his death on the 18th April 1552. Some of Leland's papers, after passing through several hands, were deposited by Burton, the historian of Leicestershire, in the Bodleian Library at Oxford in 1632. Others came into the possession of Sir Robert Cotton, and are now, along with the rest of his books, in the British Museum. Leland gained additional fame in his own day as a linguist and a poet. His principal works are,—*A Nueve Yeare's Gift to King Henry VIII. in the 37 yeare of his Raygne*, Lond. 1549; *Commentarii de Scriptoribus Britannicis*, edited by Anthony Hall, Oxon., 1709, 2 vols. 8vo; *The Itinerary*, published by Thomas Hearne, Oxford, 1710-12, 9 vols. 8vo, and reprinted in 1770; and *De Rebus Britannicis Collectanea*, edited by Hearne, Oxon., 1715, 8vo, and reprinted at London in 1770.

LELAND, John, D.D., an eminent Christian apologist, was born at Wigan, Lancashire, in 1691; but soon afterwards removed, along with his family, to Dublin. At an early age, he was appointed minister of a congregation of Presbyterian Dissenters in Dublin. He received the degree of D.D. from the University of Aberdeen. In 1733 he published a pamphlet in reply to Tindal's *Christianity as Old as the Creation*. In 1737 he answered *The Moral Philosopher* of Dr Thomas Morgan; and in 1742 Dodwell's *Christianity not founded upon Argument*. His remarks on Bolingbroke's *Letters on History* appeared in 1753. In the following year, his calm scrutiny of objections, his learning, and solidity of argument, were shown to advantage in his *View of the Principal Deistical Writers that have appeared in England*. Towards the close of his life he wrote an elaborate treatise on *The Advantage and Necessity of the Christian Revelation, shown from the state of Religion in the ancient Heathen World*. Leland died in 1766, leaving behind him a reputation for charity and candour, unembittered by a long life of controversy and dispute.

LELAND, Thomas, the translator of Demosthenes, was born at Dublin in 1722. Entering the university of that city as a pensioner of Trinity College in 1737 he was

elected a scholar in 1741, and a fellow in 1746. In 1763 he was nominated professor of poetry. In 1768 the Lord-Lieutenant appointed him his chaplain, a prebendary of St Patrick's Cathedral, and vicar of Bray. In this new capacity, his energetic and perspicuous eloquence soon rendered him the most admired preacher in Dublin. He died in 1785.

His works are:—*Translation of Demosthenes*, London, 1777; *History of the Life and Reign of Philip of Macedon*, London, 1805; *A Dissertation on the Principles of Human Eloquence*, London, 1764; *Sermons*, 3 vols., Dublin, 1788; and *History of Ireland*, London, 1778.

LELY, SIR PETER, a celebrated painter, was the son of a captain in the garrison of Soest, in Westphalia, and was born in that town in 1617. His father, a native of Holland, was originally called Van der Vaes; but the nick-name of Le Lys or Lely, by which he was generally known, was adopted by his son as a proper surname. After studying for two years under Peter Grebber, an artist of some note at Haarlem, Lely, induced by the patronage of Charles I. for the fine arts, removed to England in 1641. Here he soon became so eminent in his profession as to be employed by Cromwell to paint his portrait. At the Restoration, his genius and gentlemanly manners won the favour of Charles II., who made him his state-painter, and afterwards knighted him. To improve himself by the study of the most excellent specimens of his art, he made his famous collection, the best of his time, containing drawings, prints, and paintings by the best masters. His great example, however, was Vandyck, whom, in some of his most successful pieces, he almost rivals. Lely's paintings are carefully and delicately finished, warm and clear in colouring, and animated in design. The graceful posture of the heads, the delicate rounding of the hands, and the broad folds of the draperies, are admired in many of his portraits. His most famous work is a collection of portraits of the ladies at the court of Charles II., preserved at Hampton Court, and known by the title of the "Windsor Beauties." Of his few historical pictures, the best is "Susannah and the Elders," at Burleigh House. His "Jupiter and Europa," in the Duke of Devonshire's collection, is worthy of note. Lely was nearly as famous for crayon painting. Towards the close of his life, he often retired to an estate which he had bought at Kew, in Surrey. He died of apoplexy at London in 1680, and was buried at Covent Garden church, where a monument was afterwards erected to his memory.

LEMBERG (Pol. *Lwow*, Lat. *Leopolis*), a city of Austrian Poland, capital of the kingdom of Galicia, is situated in a narrow valley on the Peltew, a small tributary of the Bug, 185 miles E.S.E. of Cracow, and 365 E.N.E. of Vienna; N. Lat. 49. 51. 40; E. Long. 24. 2. 45. Lemberg was formerly an important fortress, but its fortifications have been destroyed, and its ramparts planted and laid out in public walks. The town itself is small, but it has four large suburbs, each of which surpasses it in size. Within the town the streets are irregular and narrow, and the houses old; but the suburbs are well laid out, and contain many handsome buildings. The houses are built of freestone, and usually two or three storeys in height. Lemberg is the seat of three archbishops, belonging to the Roman Catholic, the Armenian, and the Greek church; and the number of its ecclesiastical edifices, with their steeples and cupolas, give it, especially when viewed from a distance, an air of grandeur. Besides the 3 cathedrals, it has 13 Roman Catholic churches, 2 synagogues, one of which is the most splendid in the Austrian dominions, a Protestant chapel, and several Roman Catholic and Greek convents. In the Dominican church is a monument, by Thorwaldsen, to the Countess Dunin-Borowska. The University of Lemberg has faculties of theology, law, medicine, and philosophy, and is attended by about 1500 students. The library contains about 50,000 volumes. Among the other educational

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institutions are two gymnasia, a Roman Catholic, and a Greek ecclesiastical seminary, a normal school, and a school of arts and sciences. There is a public library of 60,000 volumes, particularly rich in Polish literature. Lemberg is more a commercial than a manufacturing city, though it carries on some manufactures of cotton and woollen stuffs, leather, &c. It is the principal trading town in Galicia, though it is chiefly limited to carrying and commission business, arising from its situation on the high road from Odessa to Silesia and Warsaw. Several important fairs are held here, the most important of which is that called *Drei Königs Messe*, which lasts for six weeks from the 14th of January. A great trade in corn and cattle is also carried on. Pop. (1849) 75,000, of whom about 20,000 were Jews.

LEMGO, a town of Germany, principality of Lippe-Detmold, on the Bega, 6 miles N. of Detmold. It has an antique appearance, and is surrounded by an old wall with seven gates. The Rathhaus and the church of St Nicholas are admirable specimens of Gothic architecture. It carries on a trade in wool, linen, leather, and meerscham-pipes, especially the last. Pop. 4200.

LEMNOS, or STALIMENE, an island in the Ægean Sea, belonging to Turkey, and situate in N. Lat. 40., E. Long. 25. Its surface is very rocky, and displays distinct traces of volcanic action. Area about 150 square miles. Its general form is that of an irregular quadrangle, but it presents the outline of two peninsulas connected by a narrow isthmus. The two indentations at the point of junction are the principal harbours, that on the N., St Antonio, affording safe mooring for large ships. A third indentation, the Bay of Kudia, on the S. side of the western peninsula, is also of some importance. The interior of the island is exceedingly barren, with the exception of some small narrow valleys in the S. and W. Where productive, it yields corn, wine, oil, and some fruit.

Lemnos is supposed to have been first peopled by Thracians; and it is recorded that it was subjugated by Miltiades, after he had taken the Chersonesus. It is fabled as the spot on which Vulcan fell when Jupiter cast him from Olympus; and its volcanic appearances have given rise to the fiction that there the ejected god established his workshop. An argillo-silicious earth, called *Terra lemnia*, mentioned by Galen, has attained great celebrity as a medicine, and is still much esteemed by Turks and Greeks. Pliny mentions a labyrinth with 150 columns, the remains of which existed in his day.

The Greek Church is the church of the people, a bishop of which resides at Lemnos, the capital (the ancient *Myrina*). This town stands on the W. coast, and has three Greek churches, a harbour, and a building-dock. It is protected by a citadel. Pop. of the island from 10,000 to 12,000.

LEMON, the fruit of *Citrus Limonum* (see BOTANY, Index), is a native of Asia, and was brought to Europe by the Crusaders. Like most of its tribe, the lemon produces under cultivation a great number of varieties. Several are known in commerce. The principal are,—the Wax Lemon (*Citrus Limonum ceriescum* of Risso): this is the *smooth-peeled one*, most generally found in the markets; its rind is thick. The Bignette Lemon (*Citrus Limonum Bignetta* of Risso) is a thinner-peeled fruit than the wax lemon, less oval in shape, and more blunt at the point; the colour of the rind is less clear, and is usually tinged with green. It is cultivated more largely than any other variety, as it yields a larger quantity of juice, and is a most abundant bearer. The Clustered Lemon (*Citrus Limonum racemosum* of Risso) is the least oval of the imported lemons, but the nipple-like point is fully developed. The rind is thick, and has a bright yellow colour. The pulp is less agreeable than the varieties previously mentioned. One

or two other varieties, as the Imperial and Gaeta lemons, are occasionally brought to this country, but not in any considerable quantities.

The lemon is extensively cultivated in Sicily, Italy, Spain, Portugal, and the S. of France. By far the greater number imported come from Messina and Palermo. The average imports into Great Britain are about 4000 boxes, or 5000 bushels.

Besides the fruit, the rind of the fruit comes either pickled in salt or already candied. From Sicily, Naples, and Lisbon we receive nearly 70,000 lb. of the essential oil of lemon, yielded so abundantly by the flavedo of the peel. In order to obtain it, the flavedo is grated off, and being put into a horse-hair bag, a yellow turbid oil is forced out by pressure; this, after standing some time, deposits a thick sediment, and is then decanted and afterwards filtered.

Lime juice is another of the products of the lemon, and is of great value as a preventive and cure for scurvy. It is received either fresh, as expressed from the fruit, in which state it is a turbid light yellow coloured liquid; or in a state of concentration from boiling. This concentrated lime juice is a thick coffee-brown coloured liquid, and is chiefly consumed in the manufacture of the crystallized citric acid, which exists in greater abundance in the lemon than in any other fruit.

Citric acid is separated from the juice with great ease, owing to the readiness with which it enters into combination with chalk, forming citrate of lime. To this sulphuric acid is added, and forms the insoluble sulphate of lime, from which the citric acid is easily obtained by washing, and subsequent crystallization. Citric acid used in the manufacture of various pharmaceutical preparations, in combination with iron, quinine, potash, &c. (T. C. A.)

LEMON, *Salt of*, a term improperly applied to bin-oxalate of potass, or salt of sorrel. It is prepared, in Switzerland and the neighbouring countries, from wood-sorrel; about 60 or 70 lb. of the mature plant yielding about 5 oz. of the crystallized salt. Some persons, deceived by the vulgar name, have used this substance to acidulate punch; but it is a dangerous practice, for the binoxalate of potass is an active poison. It is best known in this country as a means of removing ink-spots from linen. When an ink-spot is washed with an alkaline soap, it forms a yellow *iron-mould*, as it is called, in consequence of the oxide of iron, which is the basis of the ink, attaching itself to the cloth, while the tannic acid of the ink is removed by the alkali of the soap. The oxalic acid of the binoxalate of potash unites readily with most of the metallic oxides; and in the case of an iron mould, forms a colourless oxalate of iron, which being soluble, is readily removed from the linen. (C. T.)

LEMONNIER, PIERRE (CLAUDE) CHARLES, a diligent and accurate astronomer, born at Paris, on the 23d of November 1715, was the son of Peter Lemonnier, of St Sever, in the province of Normandy.

His father was a professor of philosophy in the College d'Harcourt, and member of the Academy of Sciences. He distinguished himself, as a teacher, by his activity in promoting the introduction of mathematical reasoning into the Cartesian philosophy. Under such auspices, the son might have enjoyed facilities for the cultivation of any of the sciences; but he soon showed a decided preference for astronomy, and began to be a practical observer before he was sixteen. In the month of November 1732, Mr Fouchy procured him the use of a mural quadrant of 3 feet radius, and he soon applied himself with diligence to the determination of the sun's greatest equation, an investigation which he continued for many years; and in 1741 he found the equation to amount to $1^{\circ} 55' 31''$; a quantity differing only by 7" from Delambre's latest determination.

He presented to the Academy of Sciences, in 1735, an elaborate map of the moon, accompanied by some remarks;

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and, in the month of April of the following year, before he was twenty-one years old, he was made a member of the Academy, in the character of adjunct geometrician. He continued to be a constant contributor to its *Memoirs* for more than fifty years. The winter of 1736 and 1737 he passed at Torneo, with Clairaut and Maupertuis, as a member of a committee appointed by the Academy for measuring a degree in Lapland; and he was not less zealous than any of his colleagues in the execution of that arduous undertaking.

He is considered as having effected, in conjunction with Lacaille, a complete reformation in the practical astronomy of France. He entered very early into correspondence with the English astronomers of the day; they had carried their instruments and modes of observation to a higher degree of perfection than their neighbours; and Lemonnier was of great use to the science in making known to his countrymen the practical methods of Flamsteed, and in introducing the instruments of Graham and Bird. In April 1739 he was made a foreign member of the Royal Society of London, and for the last twelve or fourteen years of his life he is said to have been the senior member of the society. He was the first that introduced the effects of nutation, then lately discovered by Bradley, into the solar tables; and he complained bitterly of Lacaille's injustice in not giving him due credit for the improvement.

The Duc de Noailles made him known to the King of France, who was fond of his company, and showed him many kindnesses. In 1742, he gave him apartments at the Capucins in the Rue St Honoré, where he continued to live till the Revolution. On another occasion, when he had taken great pains to fix an accurate meridian at St Sulpice, the king made him a present of 15,000 livres, which he expended in the purchase of instruments, as the greatest luxury that he was capable of enjoying.

The places of the stars, which he determined in 1740, served Lalande for the purpose of computing their proper motions, though they differed a little from the results of Bradley's observations. About 1746 he was much engaged in examining the inequalities of Saturn, produced by the attraction of Jupiter; and Euler employed his computations in the theory which obtained a prize in 1748; each confirming the accuracy of the other. He continued to observe the moon, without intermission, for fifty years, though a small part only of his observations was published.

In the year 1748 he went to England, partly for the purpose of obtaining further information from a personal acquaintance with the astronomers and opticians resident in London, and partly in order to observe the solar eclipse of that year, in a situation where it would be very nearly annular. He proceeded, accordingly, to Scotland with the Earl of Morton, accompanied by Short the optician, and they observed the eclipse together at Aberdour, an ancient residence of Lord Morton's, in Fifeshire. They obtained their time from the College at Edinburgh, where there was a transit instrument, by means of the flash of a cannon fired from the castle at twelve, and another five minutes after. Lemonnier was particularly anxious to measure the moon's diameter, which "he found $29' 47\frac{1}{2}''$," agreeing precisely with the computed diameter, and not requiring any correction for the supposed effects of irradiation. A similar remark was made by a very accurate practical astronomer in the eclipse of 1836.

In order to verify the position of his mural quadrant, which was of eight feet radius, and made by Bird, Lemonnier felt the advantage of having a moveable one to compare with it, and he procured a block of marble 8 feet by 6, and 15 inches thick, turning on an axis, to which he fixed his smaller instrument of 5 feet radius, in order to be able to reverse its position. He devoted a considerable portion of his time to the investigation of the laws of mag-

netism, and especially to the variation of the compass; and he endeavoured to ascertain the effect of the moon's influence on the winds, and on the atmosphere in general.

Lemonnier had long disputed the accuracy of the Parisian base, measured by Cassini and Maraldi, but he was at last convinced that his objections were groundless. He was originally a most zealous friend and patron of Lalande; but afterwards, having taken offence at some slight cause, he refused to see him for many years. In fact, he appears to have been somewhat obstinate and irritable; but he is said to have had genius, zeal, activity, and intelligence, as well as credit in the world, and reputation among men of science. He was a voluminous writer; he had much learning and sagacity, but he often wanted precision in his language and his reasoning. In November 1791 he had a paralytic attack, which terminated his scientific career, though he survived it till the 2d of April 1799, when a second stroke carried him off, at Héril, near Baieux. He was made, in the meantime, one of the 144 original members of the National Institute, as a testimony to the merit of his past labours.

He had married, in 1763, Mlle. de Cussy, a lady of very respectable family in Normandy. He had three daughters; the first married M. de Parfouru, who was an early victim of the Revolution; the second the celebrated Lagrange; and the third her uncle, Lemonnier the physician, who was also a man of considerable science, and a member of the Royal Society of London.

From 1735 to 1790 there were very few volumes of the *Memoirs* of the Academy without one or more of Lemonnier's papers; but though not unimportant in the aggregate, they are somewhat uninteresting in the detail. They relate almost exclusively to astronomical observations; eclipses, occultations, appulses, oppositions, and conjunctions; solstices, longitudes and latitudes, with some accounts of astronomical instruments and apparatus. There are also some memoirs relating to the sun's equation and diameter, and on his place, as compared with Arcturus: on the motion of Saturn, and on his fifth satellite; on the expansion of wooden measures; on the transit of Venus, and on the diameter and the tables of that planet; on Euler's formula for parallax; on the variation of the needle; on lunar altitudes; on the tides; on horizontal refraction; on Saturn's ring; and on some currents of wind. He also published separately some extensive works, which acquired considerable celebrity.

1. The first was his *Histoire Céleste*, 4to, 1741, comprehending the interval from 1666 to 1685, and containing an account of a transit instrument of Graham's construction.

2. *Théorie des Comètes*, 1743, in 8vo, including a translation of Halley's work on comets, together with a method of computing the orbit from three observations.

3. *Institutions Astronomiques*, 4to, 1746; an improved translation of Keill's *Astronomy*, which long continued to be the best elementary treatise in the French language. It contains also solar tables, and a variety of other additions derived from observation.

4. *Observations Astronomiques*, part i., 1751; ii., 1754; iii., 1759; iv., 1775.

5. A Letter on the Theory of the Winds, in Halley's *Tables*, published by Chappe.

6. *Nouveau Zodiaque, réduit à 1755*, Paris, 1755, in 8vo, containing 31 pages of charts, much more complete than those of Senex, and superseded by some very late publications only.

7. A History of Astronomy in the *Traité d'Aberration de Fontaines des Crutes*.

8. *Observations pour la Mésure du degré entre Paris et Amiens* 8vo, 1757.

9. *Abrégé du Pilotage*, par Goubert, 1766, in 4to, with additions.

10. *Astronomie Nautique Lunaire*, 8vo, 1771.

11. *Exposition des Moyens les plus faciles de résoudre plusieurs questions dans l'Art de la Navigation*, 1772, in 8vo, employing very generally a table of verse sines, and greatly recommending the use of Gunter's scale for nautical computations.

12. *Essai sur les Marées*, 1774, in 8vo, particularly describing the effects of the tides at Mont St Michel, and on the neighbouring flat

Lemonnier.

Lena sands, and including also some considerations on refraction and on magnetism.

13. *Description et Usage des principaux Instrumens d'Astronomie*, 1774, folio, forming part of the collection of *Arts et Métiers*.

14. *Atlas cœleste de Flamsteed*, 1776, in 4to, revised.

15. *Lois du Magnétisme*, 2 parts, 8vo, 1776-8, with an elaborate chart.

16. *Traité de la Construction de Vaisseaux*, par Chapman, 1779, folio, from the Swedish, and said to be less perfect than the translation of Vial du Clairbois.

17. *Mémoires concernant diverses questions d'Astronomie et de Physique*, 4 parts, 1781-84-86-88, in 4to.

18. *De la Correction introduite pour accourcir la Ligne sèche du Lock de dix-huit pieds*, 8vo, 1790.

19. *Lettre au sujet d'une Eclipsé*, Paris, 1791; together with some remarks on navigation, and on the currents of the South Seas, all apparently from the Memoirs of the Academy. The eclipse, which was observed as annular in China, should have been total, according to the computed distance of the luminaries concerned. (T. Y.)

LENA, a large river of Eastern Siberia, rises from a small lake among the Baikal Hills, about 50 miles N.E. of Irkutsk, and falls into the Arctic Ocean by several mouths between N. Lat. 72. and 73., and E. Long. 125. and 130. Its source is more than 2000 feet above sea-level, and its length is estimated at about 2400 miles. For the first 1000 miles to Yakutsk it flows from S.W. to N.E., and receives as tributaries on the right the Vitim and Olekma. It then turns round to the N.W., receives the Aldan on the right, and the Vilhoui on the left, and afterwards takes a northern but winding course to its entrance into the sea. The Lena, as its name signifies, is a "sluggish" river, with steep banks and great depth. It is said to be navigable at Kachuga, only 50 miles from its source. It is frozen over for nine months in the year, when sledges are employed as excellent substitutes for boats. Islands are very numerous in its course, as well as at its embouchure, and obstruct the navigation exceedingly. The upper valley of the Lena is covered with pine forests, affording excellent timber for boat-building; but as the river approaches the sea its shores become sterile, flat, and dreary, and thinly peopled. Near its mouth the river is from 3 to 4 miles in width, and, according to Ritter, its entire basin covers an area of about 800,000 square miles.

L'ENFANT, JACQUES, a French Protestant divine, the son of the Protestant pastor of Chatillon-sur-Seine, was born at Bazoches in Beause, a district of the ancient province of Orleannois, on the 13th April 1661. After studying at Saumur and Geneva, he completed his theological course at Heidelberg, and, receiving ordination in 1684, was appointed pastor of the French Protestant church in that city, and chaplain to the Dowager Electress Palatine. In 1688, on the descent of the French under Turenne into the palatinate, L'Enfant, who had incurred the dislike of many of his countrymen by two letters which he had written against the Jesuits, retired to Berlin. Here Frederic, the Elector of Brandenburg, afterwards King of Prussia, appointed him one of the ministers of the French Protestant church, an office which he held till his death. Visiting England in 1707, it is said that he had the honour of preaching before Queen Anne, and of being requested by her to enter the Church of England, and become her chaplain. Declining this offer, he returned to Berlin, and in 1710 became chaplain to the King of Prussia, and councillor of the high consistory. In search of materials for his historical works, he visited Helmstadt in 1712, Leipsic in 1715, and Breslau in 1725. Through the influence of the King of Prussia he had also access to the archives of the corporation of Basel. He was one of the chief supporters of the *Bibliothèque Germanique*, which was begun in 1720, and wrote the preface. On the 29th of July, 1728, he was suddenly attacked with paralysis, which caused his death on the 7th August following.

LENNEP, a manufacturing town of the Prussian province Düsseldorf, capital of a cognominal circle, on the

Lennepe, a tributary of the Wipper, 21 miles E. by S. of Düsseldorf. Woollen and cotton stuffs are manufactured in considerable quantities, and a trade in wool, iron, and wine is carried on to some extent. Pop. 7064.

LENNOX, or DUMBARTONSHIRE, a county of Scotland. See DUMBARTONSHIRE.

LENNOXTOWN, a town of Scotland, Stirlingshire, at the foot of the Campsie Hills, 12 miles N. of Glasgow by railway. It has several calico-print and alum works, besides bleachfields, collieries, and lime quarries in the neighbourhood. Pop. (1851) 3108.

LENT, the name of one of the festivals celebrated in the Roman Catholic, and many of the Protestant churches. It derives its name from an Anglo-Saxon word, signifying spring. As a religious festival, it is intended to commemorate the fasting of our Saviour forty days in the wilderness. It lasts for forty days before Easter, and is therefore moveable with that term. See EASTER, CALENDAR, &c., &c.

LENTIL, the seeds of *Errum lens* (natural order *Leguminosæ*). The lentil is closely allied to the tare, and is probably the most ancient of all the food products which man derives from the pea-tribe. The *red pottage* in Gen. xxv. 34, is the small lentil decorticated, as it is sold at the present day in the bazaars of India.

Pliny mentions two kinds of lentils grown in Egypt, one rounder and blacker than the other. These were, probably, only varieties resulting from cultivation. Three such are cultivated in France, where, as in most Roman Catholic countries, this kind of pulse is extensively used during Lent; to which season, as some suppose, it gives its name.

The lentil is a native of Europe, Asia, and Northern Africa; or, at all events, it is naturalized in those parts of the world. It is cultivated occasionally in some parts of England, but chiefly as a fodder plant. The ripe seeds are very nutritious, and contain a large proportion of gluten. They are frequently imported from Alexandria for cattle-feeding; whilst, for culinary purposes, the larger and lighter-coloured varieties are imported from France and Germany, where considerable attention is paid to their cultivation and harvesting. In Egypt the lentil forms a large proportion of the general food of the inhabitants, and the haulm is used for packing purposes.

The empirical preparation called *Revalenta Arabica*, has been proved to be nothing but the meal of decorticated lentils; a food by no means well adapted to all constitutions, especially those of infants.

The quantity of starch in the lentil is very considerable; and, in addition to the gluten, renders this pulse one of the most nutritive of vegetable food products. Lentils are, however, heating if used much. The starch, according to Einhoff, is nearly one-third its weight.

The importation of lentils is very irregular; but 2000 qrs. is the largest quantity imported in one year. (T. C. A.)

LENTINI (the ancient *Leontini*), a town of Sicily, intendency of Syracuse, on the River Porcari, 20 miles N.W. of Syracuse. It was founded in the first year of the thirteenth Olympiad, by a colony of Chalcidians, and, when taken by Marcellus, was one of the chief places in Sicily. It retained its importance till the earthquake of 1693, by which it was completely ruined. The neighbourhood is productive, but unhealthy. The inhabitants are chiefly engaged in fishing on the neighbouring lake of the same name. Pop. about 5000.

LEO I., FLAVIUS, surnamed the *Great*, and the *Thracian*, was born about A.D. 400, in the country of the Bessi, in Thrace. On the death of the Emperor Marcianus, in 457, being then only a military tribune, he was recommended by the patrician Aspar to the soldiers, who proclaimed him emperor. His election was ratified by the senate, and he was crowned by Anatolius, Patriarch of Constantinople, thus introducing the custom, which afterwards became so prevalent, of Christian princes receiving their crowns from the

Lennox
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Leo I.

Leo III. hands of bishops. No sooner had Leo ascended the throne, than he resisted the influence which Aspar sought to exercise over him, by telling him that "it was unbecoming for a prince to resign his own judgment and the public interest to the will of a subject." In 466 the Huns, invading Dacia, were defeated by his generals, Anthemius and Anagastus, with the loss of their chief, Dengizec, son of Attila. In 468 Leo, in concert with Anthemius, now Emperor of the West, equipped a large naval armament against the Vandals of Africa, who, under their king, Genseric, had long been the scourge of Italy and the Mediterranean. His fleet, consisting of 1113 ships, having each 100 men on board, was intrusted to the command of his brother-in-law, Basiliscus, who, after a prosperous passage, disembarked his troops safely at Cape Bona, about 40 miles from Carthage, the capital of the enemy. Genseric, feigning a desire to submit, requested and obtained from Basiliscus, a truce of five days. During that interval, favoured by the wind and the darkness of night, the fleet of Genseric, with several fire-ships in tow, attacked the Roman vessels, burnt and sunk one-half of them, and thus caused the entire failure of the expedition. A public opinion that Aspar had in some way effected this disastrous defeat, afforded Leo a pretext of getting rid of this dangerous king-maker. Taking advantage of a burst of public odium against Aspar, he ordered him, and one of his sons, to be put to death, and thus left a foul stain upon his own memory. Under pretext of revenging this murder, the Goths invaded Thrace, and, though overpowered after two years, disturbed the last days of Leo. He died in 474, leaving the crown to Leo, the infant son of his daughter, Ariadne. Though scarcely deserving of his surname, the *Great*, Leo was active, enlightened, and prudent; and though illiterate himself, was a liberal patron of learned men.

LEO III., *Flavius*, surnamed the *Isaurian*, Emperor of Constantinople, was born in Isauria, and was originally called Conon. His father, a wealthy grazier, emigrated from Asia Minor to Thrace, and obtained for his son the rank of a spatharius in the army of Justinian II., where his eminent abilities soon excited the jealousy of the emperor. From Anastasius II. he received the command of the troops in Asia; and when that emperor was deposed in 716 by Theodosius III., Leo, marching to Constantinople, compelled the usurper to resign, and the vacant crown was conferred upon himself, by the suffrages of the soldiers, in March 718. Soon after his accession, the Arabs, in large hordes, invested Constantinople so closely by land and sea, that the final capture of the city was considered certain. The Emperor, however, sailing out of the Golden Horn with his galleys, burnt some of the hostile vessels by means of his fire-ships, and threw the rest into confusion. After sustaining severe losses, in two other naval engagements and in one land battle, the Arabs in 720 were obliged to raise a siege which had lasted two years. Meanwhile, the deposed Emperor Anastasius II., expecting the downfall of Leo, had formed a treasonable conspiracy which was discovered in 721, and punished capitally. Shortly before this period the dislike entertained by the Mohammedans and Jews against image-worship had gradually spread among the Eastern Christians, and had originated the sect of the Iconoclasts, or image-breakers. Adopting the views of this sect, Leo issued a general edict commanding the removal of images from all the churches of the empire. His chief object was to reform the church; but he also undoubtedly aimed at drawing the Jews and Mohammedans within the pale of Christianity, and thus increasing the strength and splendour of the empire of the East. This edict met with general opposition. Instigated by Pope Gregory II., the Italians refused to obey, and when Paulus, exarch of Ravenna, was ordered to employ force, resisted, and repulsed him. Peloponnesus and the Cyclades rebelling, sent a fleet to invest Constantinople, but were

worsted in a sea engagement, and compelled to submit. In Constantinople, also, an insurrection arose, which, after causing much bloodshed, was quelled by the capital punishment of the ringleaders, and the deposition of the Patriarch Germanus. In 731 a council held at Rome by Gregory III. condemned the Iconoclasts; and incited in Italy so much opposition to Leo, that he sent a powerful armament against that country. The armament failed, and Ravenna and the exarchate were seized by the Lombards. Leo in revenge transferred, in 734, Greece, Macedonia, and Illyria from the patriarchate of Rome to that of Constantinople, an act which eventually caused the schism between the Greek and Roman churches. The remainder of his life was disquieted by a protracted war with the Arabs. He died of dropsy in 741.

Leo's character, much depreciated by the advocates of image-worship, is best elucidated by the facts of his life. His rapid rise from obscurity to the pinnacle of power, his firm and successful administration, amid foreign assaults and domestic plots, and his resolute prosecution of the reformation of the church, all indicate a wise and provident policy, great vigour, and decision of will. His early military life, although it rendered him cruel and obstinate, did not taint the purity of his manners.

LEO V., *Flavius*, surnamed the *Armenian*, was of Armenian descent, and son of Bardas Patricius. Serving as a general under Nicephorus I., he was banished for treachery, but in 811 was recalled, and appointed *dux Orientis* by the succeeding emperor, Michael I. This favour was repaid with ingratitude; for Leo, after gaining some reputation in his wars with the Arabs, accompanied his sovereign, in 813, on an expedition against Crum, King of the Bulgarians, and taking advantage of the disaffection of the army during a battle with the enemy near Adrianople, withdrew with the forces under his command, and left Michael to total defeat. Having thus stripped the emperor both of power and reputation, Leo was called upon by his army to mount the throne; and when he pretended to hesitate, his friend, Michael the Stammerer, confronted him with his naked sword, exclaiming, "With this sword will I open the gates of Constantinople, or plunge it into thy heart, if thou refusest any longer to comply with the just wishes of thy comrades." Leo marched into Constantinople, and was crowned in 813, without any opposition. In 814 the Bulgarians threatening the capital, were defeated at Mesembria; and, in the following year, Leo again repulsing them, invaded their territory, and effectually subdued them. In the peace that ensued, all his efforts were exerted to effect the equal administration of justice, and the suppression of image-worship; but his punishment of the latter offence was so severe and unrelenting, that even his best friend, Michael the Stammerer, became his enemy. Having organized a conspiracy, Michael was betrayed, tried, and condemned to be burnt. On Christmas Eve he was dragged to the place of execution; but when about to meet his fate, was remanded to prison at the entreaty of the empress, who was unwilling that the sacred season should be profaned by such a horrible death. During the night, his friends having formed a plot, appeared at the palace chapel on the ensuing morning, in the garb of priests, and while the emperor, as was his custom, began the chant, they fell upon him, and in spite of his desperate defence with the large cross, murdered him, A.D. 820. He was succeeded by Michael the Stammerer. Unlettered, and ignorant of the laws of government, Leo erred in introducing into his civil administration the severe and condign punishment of military discipline.

LEO of *Byzantium*, an historian of the time of Philip, and probably of Alexander, occupied an important office in the Byzantine commonwealth, during its invasion by Philip. According to Hesychius of Miletus, he was general of the forces. During the siege of his native city, or shortly after

Leo, V.
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Leo of Byzantium.

Leo Dia-
conus
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Leo of
Thessalo-
nica.

it, he was sent on an embassy to Athens. Byzantium, when on the eve of being captured, was succoured by the Athenian auxiliaries under Chares, B.C. 340, and afterwards under Phocion, and Philip was compelled to withdraw. After this repulse, the king, according to Suidas, accused Leo to his fellow-countrymen of having designed to betray the city for money; and Leo, afraid of falling a victim to popular fury, hanged himself. Hesychius of Miletus, however, states that he died during the siege, before the arrival of the Athenians under Chares. On both of these statements considerable doubt is thrown by Suidas and Eudocia representing Leo as the author of two works,—*Tὰ κατὰ Φίλιππον καὶ τὸ Βυζάντιον* (*The affairs of Philip and the Byzantines*); and *Tὰ κατ' Ἀλέξανδρον* (*The Exploits of Alexander*). The other works commonly attributed to him are,—*Τευθρανικόν* (*Teuthranicum*); *Περὶ Βησάλου* or *Βησαλῶν* (*De Besalo* or *Besæo*); *Ὁ ἱερὸς πόλεμος* (*The Sacred War*); and *Περὶ στάσεων* (*De Seditionibus*, or *De Statibus*). None of his works are extant.

LEO *Diaconus*, or the *Deacon*, an historian of the tenth century, was born at Caloë, a town of Asia Minor, probably about A.D. 950. From his history we learn that he was studying at Constantinople in 966; that he was in Asia in 973 or 974, when Basilus I., Patriarch of Constantinople was deposed, and that in 981 he accompanied the Emperor Basilus II. on his expedition against the Bulgarians. We infer also, from some of the events he mentions, that he must have lived at least till 993. His works are,—*Ἱστορία*, *Oratio ad Basilium Imperatorem*, and *Homilia in Michaelæm Archangelum*.

Of these, the two last exist only in manuscript. His *History* was first published at the expense of Count Nicolas Romanzof, Chancellor of Russia, accompanied with a preface, a Latin version, notes, and engravings from ancient gems, by C. B. Hase, Paris, 1818. This edition, without the engravings, was reprinted in the Bonn edition of the *Corpus Historiæ Byzantinæ*, 1828.

LEO *Grammaticus*, a Byzantine historian of the tenth century, is said to have been governor of Cibra under Constantine VII. His work, entitled *Χρονογραφία τὰ τῶν νέων βασιλέων περιέχουσα* (*A Chronography, comprising the Acts of the more recent Emperors*), is a continuation of Byzantine history from the accession of Leo V., the Armenian, A.D. 813, to the death of Romanus I. in 948. Published along with Theophanes, under the superintendence of Combéfis, Paris, 1655, in the Parisian edition of the *Corpus Historiæ Byzantinæ*, it was reprinted at Venice, 1729. Leo probably wrote his History in the time of Romanus II.

LEO of *Thessalonica*, surnamed the *Philosopher*, a learned ecclesiastic of the ninth century. The date and place of his birth are unknown. He studied grammar and poetry at Constantinople, and arithmetic, rhetoric, and philosophy in the island of Andros, under Michael Psellus. By exploring all the monastic libraries in continental Greece, and perusing their valuable contents, he amassed a large stock of general information, and, returning to Constantinople, became a teacher. One of his pupils having been captured in war by the Moslems, and becoming known through his geometrical acquirements to the caliph, who was a patron of learning, extolled the attainments of his master Leo so highly that he was despatched with a letter to the Philosopher inviting him to Baghdad. Afraid to correspond with an enemy, Leo contrived that the letter should be laid before the Emperor Theophilus, and was thus recommended to royal patronage. The emperor appointed him public teacher or professor, and afterwards ordered the Patriarch Joannes, the celebrated Iconoclast, and a kinsman of Leo's, to consecrate him Bishop of Thessalonica. On the death of the emperor, and the instalment of his widow Theodora in the regency, he was deposed from his see for his icono-

clastic opinions, but was afterwards appointed to the management of a mathematical school, established in Constantinople by the Cæsar Bardas. The latest period of Leo's life of which we have any notice is 869. The date of his death is unknown.

The only extant works that can with any probability be ascribed to Leo the Philosopher are several astrological MSS. existing in various European libraries.

LEO X., *Pope*, the second son of Lorenzo de Medici, was born at Florence in December 1475. His original name was Giovanni or John. Having taken the tonsure at the early age of seven, he was presented with two rich abbey, through the influence of his father with Louis XI. of France, and Pope Sixtus IV. Many other benefices followed; and, in 1488, when only thirteen, he was raised to the rank of cardinal by Innocent VIII. Hitherto he had been under the tuition of Chalcondylas, the famous Greek historian, and Angelo Poliziano; and, being naturally sedate even in his youth, he had evinced that love of classical learning for which he was afterwards so noted. He was now sent to Pisa to study theology, and, on his return in 1492, was invested with the purple, and soon afterwards went to reside in Rome as a member of the sacred college. On the accession of Pope Alexander VI., whose election he had opposed, he returned to Florence, and remained there until the invasion of Italy by Charles VIII. of France obliged his family to flee in 1494. Repairing to Bologna, he afterwards, in 1499, travelled through France and Germany, enjoying the society of learned men, and indulging his love of literature and the liberal arts. Returning to Rome, he lived in strict seclusion until the accession of Julius II. in 1503. Having recommended himself to the pope by his activity in public affairs, he was appointed governor of Perugia; and, in 1511, for his fidelity in this administration, he was rewarded with the high office of commander of the papal forces in the holy league against France. At the battle of Ravenna, in 1512, he was taken prisoner and conveyed to Milan, but, recovering his liberty soon afterwards, he returned to Bologna, where he governed the district as papal legate.

The death of Julius II., in 1513, recalled him to Rome, and in March of the same year he was elected his successor in the pontificate, and assumed the title of Leo X. No sooner was he seated in the papal chair, than the invasion of the north of Italy, by the French troops of Louis XII., summoned him to exercise his talent in the field. Mainly by means of Swiss auxiliaries the French were defeated at Novara, and Louis XII. was forced to seek absolution from the papal power. The peace that followed was spent by Leo in patronizing learning and the fine arts. Not long after his accession he had appointed Bembo and Sadoleti papal secretaries. He revived the Roman University by means of rich presents and valuable endowments, and by attracting to it eminent professors from different lands. A Greek press was also established; and by offering large rewards, he incited a search for ancient manuscripts in all the libraries and cloisters of Europe. In 1515, however, Leo's attention was diverted to the French, who, under the command of their young monarch, Francis I., had invaded Italy with the intent of retaking Milan. The Swiss auxiliaries of the pope were defeated at Marignano, 14th September 1515, and the French entered Milan, and seized the duchy. Seeing his own power in jeopardy, Leo, with characteristic prudence, and despite the advice of his cardinals, hastened to the king at Bologna; and there was concluded the concordat in which the pope, in return for the ceding of Parma and Piacenza to the French, shared with the king the rights of the Gallican church. During this crisis the Duke of Urbino, who was receiving the pope's pay, had proved treacherous; and in 1516 Leo, after a hard struggle, stripped him of his duchy, and, by conferring it upon his

Leo X.

Leo,
Leonardo
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Leoben.

own nephew, increased the influence of his family. In 1517, alarmed at a conspiracy that had been formed to poison him, he created thirty-one cardinals in the same day, chiefly from among his own relations. To furnish money for his extravagant pleasures, in the same year he authorized the sale of indulgences, a practice that first roused the opposition of Luther. Desirous of recovering Parma and Piacenza, which he had ceded to Francis I., he formed, in 1521, a league with Charles V., stipulating, as one of the conditions, that Luther should be deprived of the emperor's protection. The allied armies were successful; the French were driven out of Milan, and Parma and Piacenza retaken. Leo, soon after receiving the welcome tidings at his favourite villa Malliana, returned to Rome, and there, amid the festivities and rejoicings on account of the success, was attacked by a sudden malady, which, after eight days, closed his career on the 1st December 1521.

Leo X. has been happily named by Ranke a child of fortune. After his auspicious birth and influential patrons had started him on the highway to preferment, a fair amount of prudence and conduct easily led him to his exalted position; and common policy, with little effort, enabled him to hold his seat. His greatest weakness was his excessive devotion to pleasure; and this being chiefly intellectual and æsthetical, was the cause, perhaps, of his greatest virtue—his liberal patronage to men of genius. During his autumnal residence in the country, the intervals between hawking, hunting, and fishing, were pleasantly squandered in listening to musicians, and improvisatori. When theatres and festivals failed to please in winter, the writings of Machiavel, the poems of Ariosto, and the paintings of Raphael, were sources of new and equally eager pleasure. Even his political activity, never following matters into details, and exercising only the nobler mental faculties, gratified his ruling passion. His heavy debts rendered him unpopular; while his neglect of religious duties, and his refusal of the sacraments on his death-bed, gave, perhaps, sufficient reason for the current belief that he was a sceptic. His chief claim to remembrance is founded on the striking events of the age in which he lived. (Roscoe's *Leo X.*; Sismondi's *Literature*; Ranke's *Popes.*)

LEO, *Leonardo*, one of the most distinguished composers of the Neapolitan school of music, was born at Naples in 1694. He studied for several years at Rome under the celebrated composer G. O. Pitoni, who was also the master of Feo and Durante. On his return to Naples in 1717, Leo was appointed chapel-master of the church Santa Maria Solitaria, and afterwards became master of the conservatory La Pietà, and finally of the conservatory of Sant' Onofrio, in which last school several of the greatest composers of the eighteenth century were his pupils. Some writers have stated that he died in the year 1742, but the Abate Giuseppe Bertini, in his *Dizionario Storico*, &c., 1814, says that Leo died in 1745. A later writer refers to the inscription on a portrait of Leo, preserved in the Royal College of Music at Naples, according to which Leo's death occurred in 1756. He died of apoplexy, and was found dead with his head leaning on his harpsichord. Alessandro Scarlatti, and his successors Durante, Leo, and Feo, share the honour of having founded the great Neapolitan school of musical composition. Leo was a voluminous composer for the church and for the theatre, and his music is always beautiful and expressive, as well as original and scientific. Dr Burney speaks highly of Leo's music, and alludes to the *Miserere* in eight real parts, which was performed by more than forty voices at the Pantheon, London, in 1781. That *Miserere*, for two choirs without orchestra, was published at Paris, by Choron, in 1808.

(G. F. G.)

LEOBEN, a town of Austria, in Styria, in the circle and 9 miles W.S.W. of Bruck, on the River Mur, 1670 feet above the sea-level; N. Lat. 47. 23. 36, E. Long. 15. 0. 25.

It is surrounded by a wall with three gates, and has extensive barracks, and several elegant public buildings, as the town-house, deanery church, and theatre. Some trade is carried on, principally in coal, iron, and salt. A treaty of peace was signed here between France and Austria on the 18th of April 1797. Pop. 2500.

LEOCHARES, an Athenian sculptor, is mentioned by Pliny as living B.C. 372. In B.C. 352, he was one of those employed to erect the famous mausoleum in honour of Mausolus, King of Caria. He was engaged, along with other artists, in commemorating Philip's victory at Chæro-neia, B.C. 338, and produced, for that purpose, his famous portrait statues of Philip, Alexander, Amyntas, Olympias, and Eurydice. The time of his death is unknown. His masterpiece was the Rape of Ganymede, by the bird of Jove, a bronze statue, which was much admired in its own time; and though now known only through very imperfect marble copies, still charms by its blended grace and dignity. The best copy is in the Museo Pio-Clementino. Of his other statues, the most famous are his Jupiter Tonans, characterized by Pliny as "*ante cuncta laudabilem*," and his Autolycus.

LEOMINSTER, a municipal and parliamentary borough and market-town of England, county of Hereford, on the Lugg, a tributary of the Wye, 12 miles N. by W. of Hereford, and 137 miles W.N.W. of London. The town-hall, or "butter cross," is a quaint-looking structure of wood and plaster, erected about two centuries ago. The parish church is a handsome edifice, exhibiting the architecture of various periods, and surmounted by a tower 100 feet high. A free grammar school, founded by Queen Mary, has ceased to furnish gratuitous instruction, and is now a private school. Leominster has a considerable trade in wheat, hops, cider, and wool; and some manufactures of woollens, leather, hats, and gloves, for which last it was once noted. The borough is governed by a mayor, 4 aldermen, and 12 councillors, and returns 2 members to parliament. Registered electors 551. Pop. (1851) 5214.

LEON, one of the old kingdoms of Spain, lying between N. Lat. 40. 10. and 43., W. Long. 4. and 7., and divided into the modern provinces of Leon, Zamora, and Salamanca. It is bounded by Asturias on the N., Old Castile on the E., Estremadura on the S., and Galicia and Portugal on the W.; area 15,027 square miles. The whole region is included in the basin of the Douro, with the exception of a small portion at the N.W. angle, which is drained by the Sil, an affluent of the Minho. Leon is inclosed by the two great mountain ranges that pass along its northern and southern frontiers. The Asturian Mountains on the N. form part of the great Pyrenean chain, and send off various offshoots into Leon, especially one great chain extending in a S. and S.W. direction through the northern part of the province, and separating the basin of the Douro from that of the Minho. The southern range forms part of the great central chain of the peninsula, and the highest of its summits, the Sierra de Gredos, rises to the height of 10,552 feet. There is a small range which leaves the southern chain, and runs N.W. across the southern part of the province. From these hilly regions flow down a considerable portion of what constitutes the volume of the Douro, including the Esla, with its tributaries, from the mountains of Asturias, and the Tormes from the southern range. Iron is the chief mineralogical production, and is manufactured in various ways. The soil is good, but much in want of irrigation. The mountainous parts of the province are richly wooded, and its oaks are reputed the best in Spain. The plains are very fertile, and produce abundant crops of wheat, maize, flax, &c., though the agriculture is very imperfect. The inhabitants are chiefly employed in tending sheep and cattle. The mules and asses of the province are celebrated throughout Spain.

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The Leonese are a hardy set of people, inured to mountain life, and jealous of any innovation that comes from the plains. They are ill-housed, ill-educated, and ill-fed. Industry is altogether in a wretched state, and consequently there is very little trade. The means of communication are few and bad, the roads being in a barely passable condition. Pop. (1849) 708,833.

Leon was anciently inhabited by the Vettones and Cal-laici, and formed part of *Hispania Tarraconensis*. In the eighth century it was consolidated into a kingdom by Don Pelayo and his successors, and in the eleventh incorporated with the kingdom of Castile by Ferdinand the Great. After some fruitless attempts to regain its independence, it was finally subjugated in the thirteenth century by Ferdinand III.

The modern province of Leon comprises the northern part of the old province, and is bounded on the N. by Asturias, E. by Old Castile, S. by Valladolid and Zamora, and W. by Galicia. Its greatest length is 120 miles, and its mean breadth 60 miles. The surface is hilly, and generally affords good pasturage for cattle, and it is traversed by a number of streams, of which the most considerable are Upper Douro, the Esla, and Sil. Area 5871 square miles. Pop. in 1849, 288,833.

LEON (the ancient *Legio*, so called from the *Legio septima Gemina* having been stationed here), a city of Spain, capital of the above province, situate in the angle formed by the junction of the Torio and Bernesga, 176 miles N.W. of Madrid, in N. Lat. 42. 30.; W. Long. 5. 35. The town is surrounded by old decayed walls, and though containing many magnificent buildings, presents everywhere the appearance of ruin and decay. The streets are narrow and dirty, conveying the idea of great poverty. Some of the edifices are exceedingly handsome. The cathedral, founded about 1199, was formerly one of the most graceful and elegant buildings in the world. It is built in the pointed Gothic style, of a warm cream-coloured stone, and is remarkable for its lightness and proportion. The grand west entrance from the *Plaza Mayor* has three portals, richly ornamented with elaborate sculpture, a noble rose window, surmounted by a pinnacle, and a tower on each side. The south front has also a *plaza* and three arched doorways, richly sculptured. The north façade has been deformed by balustrades and candelabra; the east is circular and Gothic, with flying buttresses and pinnacles. The interior is also remarkable for its lightness and simplicity, but has been greatly deteriorated by modern attempts at improvement. It contains much carved work, and many monuments and relics of interest. Most notable among the other buildings are,—the church of San Isidoro, a huge structure, also Gothic, founded in 1063; the convent of San Marcos de Leon, once the property of the order of Santiago; the town-house, built in 1585; the episcopal palace; public library, contained in an old nunnery; and a palace called *La Casa de los Guzmanes*. There are many institutions for educational and benevolent purposes, including a diocesan seminary; the gymnasium; primary, normal, and other schools; and four hospitals. Weaving linens, knitting caps and stockings, and making gloves, are the principal occupations of the people. What trade there is is mainly owing to two weekly markets and three annual fairs, which last for several days.

Leon was founded prior to the reign of the Emperor Galba, and was taken by Leovigildo in A.D. 586. On being recovered from the Moors, who held it for some time, it became for three centuries the residence of the kings of Leon. Under Don Pedro it lost this honour, by the transference of the court to Seville. It was sacked by Soult in December 1808. Remains of the ancient Roman wall are still extant. Pop. about 5500.

LEON, a town of Central America, capital of Nicaragua,

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in N. Lat. 12. 25., W. Long. 86. 50.; 90 miles N.W. of Leon, Isla Grenada, and 10 from the Pacific Ocean. The town is laid out on a regular plan, with spacious streets and squares, and occupies a large space. The houses are chiefly built of unbaked bricks, and seldom higher than one storey. Its public buildings are among the most beautiful in Central America. Pre-eminent stands the cathedral, with a lofty dome and two towers with pyramidal tops; it has the appearance of a fortress, and was at one time surmounted by thirty guns: there are on its walls marks of repeated bombardments. The bishop's palace has an elegant portico and fine gardens attached to it. Many of the churches are fine structures, the principal being those of La Merced, Recoleccion, and Calvario. The other most prominent buildings are the Tridentine College of St Ramon, once an important establishment, but now decayed; the government-house; and the hospital, formerly the convent of San Juan de Dios. Its suburb, Subtiaba, or Old Leon, has also some fine buildings, the chief of which is its church, consisting of three naves, with columns of cedar, and crowned by beautiful towers. Dressed leather and cutlery are the staple manufactures of Leon; its commerce is inconsiderable, and is confined to the neighbourhood. It was originally founded in 1523 on the spot now occupied by Old Leon, and was removed to its present position in 1532. The revolutions, of which the country has often been the theatre, have almost all severely visited Leon, and plenteous traces of these visitations are still to be seen. Pop. about 25,000.

LEON, *Isla de*, an island on the S.W. coast of Spain, province of Cadiz, separated from the mainland by a narrow but deep strait, called Santi Petri, is about 12 miles in length from S.E. to N.W., and from 1 to 3 miles in breadth. The broadest portion is next the mainland, while the narrowest part, which forms a long spit, juts into the Bay of Cadiz. On the extremity of this peninsula stands the city of Cadiz, cut off from the rest of the island by a fortification called La Cortadura. The surface of Isla de Leon is flat and covered with saline marshes, from which large quantities of salt are extracted by the inhabitants. Communication with the continent is effected by means of an ancient bridge thrown over the Santi Petri. The chief towns on the island are Cadiz and San Carlos.

LEON *Nuevo*, a Mexican state. See MEXICO.

LEON, PETER CIEGA DE, author of the *History of Peru*. He left Spain, his native country, at thirteen years of age, in order to proceed into America, where he resided seventeen years, and observed so many remarkable things, that he resolved to commit them to writing. His history was begun in 1541, and completed in 1550. He was at Lima, the capital of the kingdom of Peru, when he put the finishing stroke to the work, and was then thirty-two years of age. The first part was printed at Seville in 1553.

LEONFORTE, a walled town in the interior of Sicily, province of Catania, 37 miles W.N.W. of the town of that name, is situate in a mountainous district near the right bank of the Dittaino. It consists, for the most part, of a large square, with two main streets diverging therefrom. The inhabitants trade in grain, wine, oil, silk, sulphur, and asphaltum; the two last existing in large quantities in the neighbourhood. An annual fair is held here. Pop. about 11,000.

LEONINE VERSES, were Latin compositions, constructed according to the laws of the classic metres, but also elaborately decorated with rhyme. Though possessing no great merit, they were very popular in the middle ages. The name is probably derived from Leoninus, a canon of Paris, and subsequently monk at Marseilles, in the twelfth century. Other derivations have been proposed, but with little plausibility. These verses have been traced as far back as the third century, at which era Commodianus wrote a piece of 1200 jingling verses. Two centuries after this, Latin

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Leopardi. rhyme appears to have been introduced into the hymns sung in the churches. (See HYMNS.) St Augustine and the venerable Bede are amongst the number of leonizers. The poem of the former against the Donatists contains 270 lines, all of which rhyme to the letter E. One of the most popular works of the eleventh century, *Regimen Sanitatis Salernitanum*, which proceeded from the physicians of Salerno, belongs to the same school. The history of the first Crusade, and the adventures of Richard Cœur de Lion, were celebrated in similar strains.

The proper leonine consists of a couplet rhyming at the end. But the line or two lines may have the rhyme distributed throughout in a great variety of ways. When the verse is divided into two members, each member, not only of the line, but of the couplet, may rhyme. Or, as in the following, the corresponding pauses in the couplet may rhyme:—

“ Si tibi grata *seges*—est morum, gratus *haberis*;
Si virtutis *eges*—despiciendus *eris*.”

But the greatest amount of variety was produced by dividing the verse into three pauses, *e.g.*—

“ O miseratrix—O dominatrix—præcipe dictu;
Ne devastemur—ne lapidemur—grandinis ictu.”

Sometimes the three members rhymed—sometimes the whole verse of the couplet; and even farther than this, leonines occur in which every word of the one line rhymes to every word in the second. As in the case when the line was divided into two members, so here the rhyme might be manifested in the corresponding pauses of the couplet. Another device of the leonizers was that of making a pause supply the place of a common introduction to a number of lines following. Thus, in the rules to be observed at meals,—

“ Dum manducatis { vultus hilares habeatis;
sal cultello capiat; }
quid edendum sit ne petatis, &c. ;”

and so on for eleven lines, each ending in *atis*. The vigorous literature which arose at the time of the Reformation almost entirely banished the taste for leonizing.

LEOPARDI (GIACOMO), COUNT, eldest son of the Count Monaldo Leopardi and the Marchioness Adelaide Artici, was born at Recanati, in the march of Ancona, June 29, 1798. In early childhood he was taught Latin and the grammar of his own language by two priests; and in his tenth year he began, without assistance, the study of Greek. Until his fourteenth year, he had no other instructor than the extensive library which his father, himself a literary man, had inherited from his ancestors.

The first part of his short career was entirely devoted to philology, in which his attainments were so great as to secure him a place among the most eminent philologists of his day, at an age when most men are still studying at college. In August 1814, when just sixteen years of age, he completed his commentary on *Porphyry's Life of Plotinus*, from which Creuzer has extracted the addenda, to be found in the third volume. In the same year, Leopardi wrote his commentaries—*Sulla vita e gli scritti di taluni retori del II. secolo*, a book of such merit, that, when Cardinal Mai published an edition of Fronto's *Letters*, in the following year, he availed himself of Leopardi's annotations; and not long after, when editing *Dionysius of Halicarnassus*, he quoted his letter to Giordani as an authority. Leopardi's next work, *Saggio sugli errori Popolari degli Antichi*, published in 1815, astonished the learned by the variety and amount of erudition displayed by a youth of seventeen. De Sinner, in his *Excerpta ex schedis criticis Jacobi Leopardi Comitissæ*, Bonnæ, 1834, lauds the “*admirandæ lectionis et eruditionis opus*.” Another essay, *Sulla riputazione di Orazio fra gli Antichi*, which appeared in 1816, shows how deeply he was imbued with the feelings of the ancients. The *Osservazioni sulla Batrachomachia* (1817) were reprinted by the learned

Bothe, in his celebrated edition of Homer's *Odyssey* (Leipsic, 1834), and by Berger de Xivrey, in his second edition of the *Batrachomachia* (1837). The *Annotazioni alla Cronaca di Eusebio*, published by Mai and Zorhab, the dissertation on Moschus and Bion, the translation of their *Idyls*, and a number of valuable researches, remarks, and essays, on other Greek and Latin authors, followed each other in rapid succession during the years 1816–17.

Leopardi's knowledge of the dead languages, added to his own fine intellect and quick perception, enabled him so to identify himself with the ancient world, that his *Hymn to Neptune*, which he gave as a translation of a newly-discovered Greek poem, and two Greek odes, which he passed off as Odes by Anacreon, published in 1817, remained for some time undetected forgeries. Another forgery (in 1826), the translation of a *Martyrdom of the Holy Fathers of Mount Sinai*, was accepted by Cesari, and admired as a *testo di lingua*. A dissertation on the *Titanomachia*, from the *Theogony* of Hesiod, and some very fine translations from Simonides, terminated the first epoch of his life.

From his constant researches into the social, political, and heroic elements of antiquity, he had acquired an enthusiastic elevation of character, which, added to his retired life and his simplicity of manners, seemed to remove him entirely from his own age, and to connect him with the great men of ancient Greece and Rome. Thus inspired by the noble deeds, and tempered by the severe beauty of his models, his poetry burst forth with a pathos and energy that has led an enthusiastic critic to affirm, that Italian poetry began with Dante and ended with Leopardi. His first *canzone* was dedicated to Italy, his second to Dante, his third to Cardinal Mai. With the political feeling common to all the modern poets of Italy, there breathes in Leopardi's verses a spirit of sublime scorn, such as an ancient Roman might be supposed to feel when writing to an audience of his degenerate countrymen.

At the age of twenty, he had a reputation throughout Italy for the finish of his style, the vigour of his sentiments, and the Attic elegance of his versification. He was then at the zenith of his fame. A year before, he had said, in a letter to one of his friends,—“I do not wish to live with the multitude: mediocrity frightens me.” But the precocious genius already carried within him the germs of disease and death. He was soon after assailed by a severe illness, and, in 1819, his sight was so much impaired, that he was forbidden to read; and an affection of the spine brought with it acute pain and deformity. He was then, for the first time, compelled to leave his home at Recanati. The snows of the Apennines made his residence there injurious; while political disagreement between him and his father added mental to physical suffering. He went to Rome, where he became acquainted with Niebuhr, who spoke and wrote so highly of him, that the Chevalier Bunsen, when in that city, went to visit him, and was surprised to find the philologist and poet in a poor chamber, “pale and shy, a mere youth, of weakly figure, and obviously in bad health.” Niebuhr offered him a professorship in the University of Berlin, but this he declined. Bunsen remained his warm admirer to the last. At this period, he contributed to the *Effemeridi Letterarie di Roma* his annotations on the Armenian *Philo* of Aucher, a translation of Virgil's *Moretum*, and some learned papers on Cicero's *De Republica*; at the same time, he was intrusted with the arrangement of the Greek manuscripts in the *Bibliotheca Barberiniana*.

It was now that he fell into that desponding state of mind which casts a peculiarly mournful shadow over his poetry. The contrast between the great men of antiquity with whom, in his library at home, he may be said to have lived, and the meanness of those with whom he now mingled in daily life, swept away the bright illusions of his youth, and made him feel a stranger in the world. To the political, social,

Lepanto. and religious misfortunes of his country, which affected him deeply, there were added personal difficulties and struggles, which made his life a burden. He travelled from Rome to Milan, thence to Florence and Bologna, and then returned to Rome again; but his moral illness seemed even more incurable than that of his body, and nothing could overcome his growing disgust of life. Amid his misfortunes he met with one consolation, the friendship of Antonio Ranieri, a Neapolitan, who invited him to his house at Naples, where he remained seven years. While there, Leopardi passed his time alternately at the foot of Vesuvius, where he uttered the last and most plaintive of his songs, *La Ginestra, o il Fiore de' Deserti*, and on the Hill of Capodimonte, where he died of dropsy, 16th June 1837.

As a philologist Leopardi belongs to that class of patient investigators who have thrown that light of sound criticism on classic literature by which Germany has so justly acquired her learned reputation. The Italians, however, to whom Europe is indebted for the preservation of the treasures of ancient culture, have not, in the midst of adverse circumstances, forgotten the traditions of their ancestors, and the Niebuhrs, Creuzers, Bothes, Theils, &c., find their rivals in the Marinis, Mais, Giordanis, Cancellieris, &c., to whom we must now add the name of Leopardi. As a poet, Leopardi has written some of the most painfully eloquent passages to be found in any language. His passion is spontaneous, deep, and true—never exceeding the modesty of nature. He stands almost alone between Alfieri, Parini, and Foscolo, on one side, and Monti and Manzoni, on the other. The *Paralipomei della Batrachiomachia* exhibit a fair example of his power of satire; in this style of composition he is neither so delicate as Parini, nor so original as Giusti; yet he is more impassioned than the one, and more correct than the other. He is, however, more a Lucian than a Juvenal. Among his poems may be found some charming sketches from nature, calm, delicate, and highly finished. Such are *Il Sabato del Villaggio*, *La sera del dì di Festa*, &c. As to his prose, when his *Opere Morali*, *Detti Memorabili di F. Ottonieri*, and his *Dialoghi* appeared in 1827, Manzoni exclaimed, "This is the best written prose that has appeared for many years."

Leopardi's friend, Ranieri, erected in the little church of St Vitale, in Naples, near the Grotte di Posilippo, not far from the last resting-place of Virgil and Sannazzaro, a tomb of marble to his memory. The whole of his works have been translated into German by Karl L. Kannegiesser, while another translation of a part of them was published by Bothe, the learned editor of Homer. (See *Opere di Leopardi raccolte ed ordinate per cura di Ranieri, Giordani, Pellegrini e Viani, Firenze*, 1845, which is the last and most complete edition in Italian; *Sainte Beuve, Portraits Contemporaines*, vol. iii., Paris, 1846; *De Montlaur G. Leopardi*, Moulins, 1846; *Reinische's Museum*, Bonn, 1834; *Schulz* in the *Italia*, a German selection of various writers, Rome, 1840; *Blessig-Augsburger Allgemeine Zeitung*, 1840; and the *Quarterly Review*, London, 1849–50, vol. lxxxvi. (E. F.)

LEPANTO, the ancient *Naupactus*, called by the Greek peasants *Epakto*, a town of Northern Greece, province of Etolia, situate on the River Morneo, about 4 miles E.N.E. from the Castle of Roumelia, in N. Lat. 38. 21. 50., and E. Long. 21. 46. It stands in the midst of a fertile territory, covered with olives, vineyards, and corn fields. Viewed from the sea, it is of a triangular form, receding up the slope of a hill, crowned by a fortress, from which a wall, diverging on either side, runs down to the shore, and shuts it in. Several walls run across the inclosure, with gates for intercommunication. The modern town is confined to the lowest inclosure, in which is also the harbour, which, although once available for ships of great size, is now navigable only by small craft.

The name *Naupactus* is said to have originated with the Heraclidæ, who are reported to have built there the fleet with which they invaded the Peloponnesus. After the Persian war it fell into the possession of the Athenians, who settled in it the expatriated Messenians. The Athenians made it their chief military station in Western Greece during the Peloponnesian war. At its close, Lepanto was taken by the Locrians, and afterwards passed in succession through the hands of the Etolians, Macedonians, Achæans, and Romans. In 1475 it was invested by the Turks, who, after the loss of 30,000 men in four months, were forced to raise the siege. Within the Gulf of Lepanto, in 1571, was fought the great naval engagement between the Ottomans and the Christian powers of the Mediterranean, under Don Juan of Austria, in which the former lost about 200 galleys, and 20,000 men. Cervantes, the author of *Don Quixote*, distinguished himself in this conflict.

LEPIDI, a Roman family, one of the most distinguished of the Æmilian clan, whose names frequently occur in Roman history.

Marcus Æmilius Lepidus, was one of the three Roman ambassadors sent to the Egyptian court in 201 B.C., became one of the pontiffs in 199, was elected ædile in 192, prætor in 191, and consul in 187. In 180 B.C. he was created pontifex maximus, in 179 censor, and in 175 elected consul a second time. After having been six times appointed *princeps senatus*, he died in 152 B.C.

Marcus Æmilius Lepidus Porcina, becoming consul in 137 B.C., waged war with the Vaccæi in Spain, without the sanction of the senate, and for this offence was degraded from his proconsulship in 136 B.C. He was augur in 125 B.C.

Marcus Æmilius Lepidus, father of the triumvir, was prætor in Sicily in 81 B.C. In 79 B.C. he was the rival of Sulla for the consulship, and through the influence of Pompey was successful. Having raised an army for the purpose of overthrowing the aristocratic constitution established by Sulla, he was declared a public enemy by the senate in 77 B.C., and having been defeated and driven from Italy, he died shortly afterwards of a broken heart.

Lucius Æmilius Paulus, son of the preceding, accused Catiline in 63 B.C., was quæstor in Macedonia in 59 B.C., and endeavoured to effect the recall of Cicero from banishment in 57 B.C. He was ædile in 55 B.C., and prætor in 53 B.C. Becoming consul in 50 B.C., he opposed the ambitious designs of Cæsar, but a bribe from the latter changed his conduct. In 43 B.C., along with others of the senators, he declared his brother, the triumvir, a public enemy. He died soon afterwards.

Marcus Æmilius Lepidus, the triumvir, was appointed interrex in 52 B.C., for the purpose of holding the comitia. At the commencement of the civil war in 49 B.C., he espoused the cause of Cæsar, who appointed him, in 48 B.C., proconsul of Hispania Citerior, and in 46 B.C. named him his colleague in the consulship. In 43 B.C., in concert with Octavian and Anthony, he formed the first triumvirate, which was renewed in 37 B.C., and dissolved in 36 B.C. by Lepidus being deprived of all power, and sent into private life. He died in 13 B.C.

Paulus Æmilius Lepidus, the son of L. Æmilius Paulus, and nephew of the triumvir, became consul in 34 B.C., and censor in 22 B.C., and died while holding the latter office.

LEPROSY, a chronic cutaneous tubercular disease, prevalent from the earliest historical times, among the ancient Jews and Egyptians, and a malady that was very common during the middle ages in the different kingdoms of Europe, and which still exists to a great extent in many quarters of the old and new world. Leprosy is one of the most incurable and most loathsome of human maladies. When speaking of the cases of it which he saw in Syria, in the seventeenth century, the old English traveller Maundrell describes it as a "distemper so

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Leprosy.

Leprosy.

noisome that it might well pass for the utmost corruption of the human body on this side the grave." In many medical works, from the time of Aretæus, Ætius, and the later school of Greek physicians, down to our own days, the affection is described under the name of elephantiasis, or elephant disease, because, to quote the words of Aretæus, "It is disgusting to the sight, and terrible in all respects (*et visu fœdus et in omnibus terribilis*), like the beast of the same name."

When leprosy, or the elephantiasis of the Greek physicians, is fully developed, it is characterized by the presence of dusky red, or livid tubercles of different sizes upon the face, lips, nose, eye-brows, ears, and extremities of the body. The skin of the tuberculated face is at the same time thickened, wrinkled, and shining, and the features very greatly distorted. The hair of the eye-brows, eyelashes, and beard falls off; the eyes are often injected, and the conjunctiva swelled; the voice becomes hoarse and nasal; the sense of smell is impaired or lost; and that of touch, or common sensation, is strangely altered, for, whilst the tuberculated and other affected parts are, in the first instance, sometimes supersensitive, latterly, in the course of the disease, they become paralyzed or anæsthetic. As the malady proceeds onwards in its course, the tubercles soften and open; ulcerations of similar mucous tubercles appear in the nose and throat, rendering the breath extremely offensive; tubercular masses, or leprous tubercles, as shown by dissection, begin to form also internally upon various mucous membranes, and on the surface of the kidneys, lungs, &c.; cracks, fissures, and circular ulcers appear on the fingers, toes, and extremities, and joint after joint drops off by a kind of spontaneous gangrene. Sometimes the upper and sometimes the lower extremities are specially affected by this mortification and mutilation of parts. Dr Halbesk, in looking down from a neighbouring height into the large leper hospital of Hamel en Arade, tells us that he noticed particularly two of the leper inmates sowing pease in the field. "The one had no hands, the other had no feet—these members being wasted away by disease. The one who wanted the hands was carrying the other who wanted the feet upon his back, and he again carried in his hands the bag of seed, and dropped a pea every now and then, which the other pressed into the ground with his foot; and so they managed the work of one man between the two." The duration of tubercular leprosy from its first commencement to its fatal termination is usually about nine or ten years.

An endless variety of medical measures has been tried with the hope of arresting or curing tubercular leprosy with little or indeed no success. But though the disease in individual subjects seems to be beyond the power of medical control, yet the malady, as affecting individual communities and kingdoms, has sometimes been more or less completely arrested in its course and prevalence.

Leprosy still exists in Palestine and Egypt, the countries from which we have the first accounts of it. On the reputed site of the house of Naaman at Damascus, stands at the present day an hospital filled with unfortunate patients affected, like him, with leprosy. Outside the Zion gate at Jerusalem there is still a leper village, the inhabitants of which yet speak to you "afar off," as they did in the time of Christ. But the same disease is now almost unknown at the present hour in the central and western kingdoms of Europe, and yet in the middle ages it prevailed in one and all of them, to a frightful extent. Laws were enacted by almost all the princes and courts of Europe to arrest its diffusion among their subjects; the pope issued bulls with regard to the ecclesiastical separation and rights of the infected; a particular order of knighthood was instituted to watch over the sick; and leper hospitals or lazarettos were everywhere instituted to receive the victims of the disease. The number of these houses has certainly

been often erroneously stated, in consequence of a strange mistake committed by Ducange, in quoting from Matthew Paris a passage in which that historian contrasts the respective possessions belonging in the thirteenth century to the Hospitalarii, Knights Hospitallers, or Knights of St John, as they were termed, and the Knights Templars. The 19,000 lazaretto-houses in Christendom, as interpreted by Ducange, mark in Matthew Paris's work merely the number of manors or commandaries of the Hospitalarii, and have no reference whatever to leprosy or lazaretto-houses. But still, that an immense number of leper-houses existed on the Continent at the period mentioned, is abundantly shown in many of the historical documents of that age. Louis VIII. promulgated a code of laws in 1226 for the regulation of the French leper hospitals; and these hospitals were, at that date, computed to amount, in the then limited kingdom of France, to not less than 2000 in number (*deux mille leproseries*). They afterwards, as is alleged by Velley, even increased in number, so much so, that there was scarcely a town or burgh in the country that was not provided with a leper hospital. In his history of the reign of Philip II., Mezeray uses the same language in regard to the prevalence of leprosy and leprous patients in France during the twelfth century. Muratori gives a nearly similar account of the extent of the disease during the middle ages in Italy; and the old Scandinavian historians amply prove that the inhabitants of the kingdoms of Northern Europe equally became its unfortunate victims.

In England and Scotland, during the middle ages, leprosy was as rife as it was on the neighbouring continent of Europe. Almost every large town in Great Britain had a leper hospital or village near it, for the reception and separation of the diseased. Some cities were provided with more than one. There were six leper hospitals in Norwich or its immediate vicinity, and five at Lynn Regis.

The ancient leper hospitals of this and other countries were intended for the isolation of the infected, not for their cure. They were charitable, hygienic, and religious, rather than medical institutions. A few of them, indeed, were well endowed, as that of Sherburne, Maiden-Bradley, Burton lazars, and others in England, and Kingcase in Scotland; but the greater part of these institutions were supported by voluntary charity; and the principal subsistence of the inmates seems to have been derived from casual alms. By some of the old forest laws of England, game and animals found dead in the wood and fields were sent to the nearest leper hospital; and in Scotland the fish left putrid and unsold in the burgh markets, were adjudged to them. The lepers were usually, by law, restricted as to the districts and places in which they presented themselves to beg for subsistence. According to the Scottish "Burrow Lawes," it was ordained that lepers "sall not gang fra dure to dure, but sall sit at the ports of the burgh, and seek almas fra them that passes in and furth;" and the Scottish parliament of 1427 enacted, that they should not be allowed to sit and beg, "neither in kirk nor in kirk-yairde, nor other places within the burrowes, but at their owne hospital." In the leper hospital of Edinburgh, the inmates begged alternately for the general community, sitting for this purpose at the door of the hospital; but they were ordered there not to "cry or ask for alms, utherways then be thair clapper." For the inmates of this and other similar institutions in this and other countries, were usually obliged by law to warn those approaching them of the presence of an infected fellow-mortal, by using a rattle or wooden clapper; whilst, at the same time, they held in their hand a "cop," or receiving dish, into which the charitable might drop their alms.

In Great Britain, as on the Continent, those affected, or supposed to be affected, with leprosy, were obliged to seclude themselves from society, or enter a leper hospital,

Leprosy.

Leprosy. both by general custom and usage, and by direct legal enactments in regard to them, made both by the court and church. Besides, according to the tenor of various old civil codes and local enactments in this and other countries, when a person became affected with leprosy, he was considered as legally and politically dead, and lost the privileges belonging to his right of citizenship. The church also took the same view, and on the day on which he was separated from his fellow-creatures, and consigned for the remainder of life to a lazaret-house, they performed over and around the yet living sufferer the various solemn ceremonies for the burial of the dead, and the priest terminated the long and fearful formula of his separation from his living fellow-creatures, by throwing upon the body of the poor outcast a shovelful of earth, in imitation of the closure of the grave.

The ritual of the French church retained, till a very late period, the various forms, prayers, and ceremonies of social isolation and banishment, to which the leper was thus subjected on the day of his living funeral. But in France, as in most other parts of Central Europe, the ceremonial is no longer required, as the malady has entirely, or almost entirely, disappeared. Isolated cases of it still occasionally occur in some villages on the shores of the Mediterranean, near Marseilles. It has been seen also during the present century in several sea-board localities in Spain; and one of the Greek islands, at the present day, continues to form a leper hospital. In Europe, however, the disease is now principally confined to Norway; but in that small kingdom, at the last census, there were found to be upwards of 2000 of its population affected with leprosy; and more than one hospital yet exists for it in Iceland. In Great Britain, no indigenous case of the disease was seen from the end of the last century till a few years ago, when one or two cases occurred in the old haunts of the disease among the western islands of Scotland, and elsewhere; and it is quite possible that it may yet revisit us again to some extent. One or two hospitals for the reception of lepers have lately been built in Canada.

Few or no physicians at the present day hold that leprosy is a disease which spreads from the infected to the healthy by contagion. But there is ample reason for believing that the affection is often transmitted hereditarily from generation to generation. Further, there are local or endemic causes in certain parts of the world capable of producing it; as we see it sometimes attack Europeans who have been residing for a succession of years in districts in the West Indies, and other countries where the disease is prevalent. What these endemic causes or conditions are, we know not. The frequency of the malady in former times has been confidently ascribed, by different authors, to peculiarities in the diet, dress, personal and domestic habits, &c., of our forefathers; and, certainly, their mode of life was, in many respects, specially calculated to generate derangements and eruptions of the skin. The good old Saxon practice of bathing appears to have become forgotten after the date of the Norman conquest; and in the subsequent history of these early times, we might trace various indirect and direct causes of cutaneous disease, in the close hovels and unventilated dwellings of the period; in the habits of personal uncleanness; in the rough straw-bedding then generally in use, and which "hard lodging" Hollinshed describes as still used by the servants in his day, "with seldome (he adds) anie sheete vnder their bodies to keepe them from the pricking straws that run oft through the canvas, and rase their hardened hides;" and probably, also, in the articles of diet on which the general community were obliged to subsist, in times before the improvement of agriculture, and the introduction of that "schamefull intemperance," as old Boece fanatically terms it, "when na fische in the see, nor foule in the aire, nor beast in the wod, may have rest, but are socht heir and thair to satisfy the hungry appetit." For

the investigation of this and other allied questions in the history of the production of our older epidemic and endemic diseases, the works of Hollinshed, Strutt, Henry, Chalmers, Macpherson, and others, contain a great and available mass of materials. We will only, however, here pause to observe, that we believe it would be no easy matter to point out the exact differences in those physical conditions of the inhabitants of this country, in former and in modern times, which may have led to the prevalence of the disease amongst our ancestors, and to its disappearance amongst us. If poverty in diet, or personal wants, and filth and wretchedness in their deepest degrees, could generate the malady, there are certainly still numerous spots in continental Europe, and even in our own land, where, unfortunately, all these elements of disease are, in our own day, in full and active operation, without any such specific result following. The alleged causes are present without the alleged effects.

In order to obtain anything like satisfactory results of the supposed physical causes of leprosy in Europe in former times, the whole question would require to be thoroughly investigated in connection with two others,—viz., the allied physical circumstances, firstly, of the inhabitants of those countries in which the disease, in the same way, formerly raged; and, secondly, of those districts of the world in which it is still prevalent. It is only by following such a line of inquiry that we could hope, if at all, to separate mere matters of opinion from matters of fact, and at last to obtain, by a kind of reasoning by exclusion, the exact physical condition or conditions of a people that are capable of originating or of spreading this particular species of disease. The difficulty of the problem may be easily appreciated by glancing for a moment at the diversified geographical localities and circumstances under which the tubercular leprosy is known at the present day to prevail. In modern times it has been found existing, to a more or less limited extent, in places the most distant and dissimilar in regard to temperature, climate, situation, soil, &c., as in Sumatra, under the equator, and in parts of Iceland almost within the verge of the arctic circle; in the temperate regions of both hemispheres, as (in the southern) at Hamel en Arade, in the Cape district, and (in the northern) at Madeira and Morocco; in the dry and arid plains of Arabia, and in the wet and malarious districts of Batavia and Surinam; along the shores of Guiana and Sierra Leone, and in the interior of Africa, Hindostan, Asia Minor, and Asiatic Russia; on the sea-coast, as at Carthage; and thousands of feet above the level of the ocean, as on the table-land of Mexico; on some of the islands in the Indian, Chinese, Caribbean, and Mediterranean seas; and at many sites far in the interior of the continents of Asia, Africa, and America. (J. R. S.)

LERIDA (the ancient *Ilerda*), a town of Spain, province of Catalonia, situate partly on a hill, and partly on the adjoining plain on the right bank of the Segre, here crossed by a handsome stone bridge, 85 miles W. of Barcelona. It occupies a position of great natural strength, and was in ancient times an important military station. In the Punic wars it took part with the Carthaginians, and suffered much from the Roman arms. In its immediate neighbourhood, Hanno was defeated by Scipio, B.C. 216; and it afterwards became still more famous as the scene of Cæsar's arduous campaign against Pompey's lieutenants, Afranius and Petreius, in the first year of the civil war (B.C. 49). Under the empire it was a very flourishing city, and a *municipium*, but it subsequently fell into decay. In the middle ages it again rose into importance, and in modern times it has sustained numerous sieges. It was taken by storm in 1707, during the war of the succession, and was again taken by the French in 1810. Lerida is the second city of Catalonia, and is strongly fortified. The principal street is nearly a mile in length, and consists of one long line of white houses, with red and green balconies, but the rest

Lerida.

Lerins
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Lesbos.

of the town is generally crowded and ill built. The old cathedral presents some beautiful Gothic, with other styles. It was built by James I. of Aragon, but often repaired. It is now fast going to decay, having never been used for religious purposes since 1707, when the French made it a fortress. The new cathedral, built in the reign of Fernando VI., is an imposing structure, of Corinthian architecture, surmounted by two handsome square towers. Pop. 12,472.

LERINS, two small islands in the Mediterranean, off the coast of France, about $2\frac{1}{2}$ miles from the shore at Cannes, and belonging to the department of Var. The larger one, called Ste Marguerite, is well wooded, and is defended by a fort which for many years was the prison of the mysterious "Man of the Iron Mask." The other islet, called St Honorat, contains the remains of a fortified convent. The former was the *Leron*, and the latter the *Lerina* of the Romans.

LEROS, or LERO, a small island of the Grecian Archipelago, belonging to Turkey; situate off the W. coast of Anatolia, opposite the Gulf of Mandelyah, N. Lat. 37. 10, and E. Long. 26. 50. It is irregular in shape, and mountainous, about 9 miles in length from S.E. to N.W., and from $1\frac{1}{2}$ to 4 miles broad. The valleys are very fertile, and the harbours numerous and excellent. The chief products are grain, olives, wax, honey, and wool. The town of Lero is situate on a bay on the E. side of the island. Leros was originally colonized by Milesians about 500 B.C., and continued under the government of Miletus until that city fell into the hands of the Romans. The goddess Artemis Parthenos had a temple here, the site of which is said to be now occupied by a convent which bears her name. Pop. about 2000.

LERWICK, a seaport town, capital of the Shetland Islands, is situate on Bressay Sound, on the E. side of the mainland. It has a very irregular appearance, consisting chiefly of a number of rather poorly built houses, of from two to three storeys in height, disposed along the winding margin of the bay. Considerable improvements have, however, been recently made, and it now contains many good shops and substantial dwelling-houses. The only public buildings are the parish church, a free church, and two dissenting chapels. The fort was built in 1665 to protect the fisheries, and repaired in 1781, when it was named Fort Charlotte. Its bastions have 12 embrasures; and it is now in charge of one or two artillerymen. It has no manufactures of any extent. The harbour is very spacious, and is entirely landlocked by Bressay Island. The import and export trade is considerable. The number of vessels registered at the port on 31st December 1855 was 52, having an aggregate burden of 1581 tons. During 1855, 162 vessels, of 19,402 tons, entered; and 143 vessels, of 18,235 tons, left the port. The chief exports are fish, butter, hides, rabbit skins, and stockings. The inhabitants are chiefly employed in the fisheries.

LESBOS (MITYLENE), in *Ancient Geography*, a large triangular island in the Ægean Sea, is situate about 7 miles from the coast of Mysia, at the mouth of the Gulf of Adramyttium, between N. Lat. 38. 58. and 39. 24. It has three chief promontories,—Argennum on the N., Malea (*Zeitoun Bouroun*) on the S.E., and Sigrium (*Sigri*) on the W. On the S.W. coast, two creeks stretching far inland form two spacious harbours,—the Portus Hieræus (*Port Hiero*), and the Euripus Pyrrhæus (*Port Caloni*). The island is in general hilly, and has three principal mountains,—Ordymnus in the W., Lepethymnus in the N., and Olympus in the S. In ancient times it was famed for its delightful climate and wholesome wines, for its agates and variegated marble. It had six principal cities,—Methymna, Mitylene, Arisba, Antissa, Eressus, and Pyrrha. Each of these constituted an independent government, and had its own distinct territories. The first two, the one on the N.

and the other on the E. shore, facing the mainland, are by far the most important in the history of the island. According to tradition, Lesbos was successively peopled by Pelasgians, Ionians, and Ælians, under their leader Lesbos, who gave his name to the island. In the Peloponnesian war, the Lesbians joined the Lacedæmonians; and as a punishment all their lands, except those of Methymna, who had not acted in concert with the other cities, were seized by the Athenians. Soon after the battle of Pharsalia, it became a Roman province. It was the birthplace of the musicians Terpander and Arion, and the philosophers Pittacus and Cratippus. Its chief glory, however was derived from the lyric poetry of Alcæus and Sappho.

LESINA, an island in the Adriatic, belonging to the circle of Spalatro in Dalmatia, separated from the peninsula of Sabbioncello by the Straits of Narenta. It is about 40 miles long, by from 2 to 6 broad, chiefly mountainous, but containing, especially on the N. side, a considerable area of fertile arable land. Its climate is remarkably mild; and it produces wine and oil, figs, almonds, and other fruits. Corn is also grown, though the quantity is insufficient for the consumption of the inhabitants. It has considerable numbers of sheep, and an anchovy fishery of some importance. Pop. 12,000. The town of Lesina, situate on the S.W. coast of the island, is the see of a bishop, and seat of a court of justice. Pop. about 2000.

LESLEY, JOHN, Bishop of Ross, was born on the 29th of September 1527. In an account of his life, for which he must himself have supplied the materials, he is said to have been born of honourable parents. Knox has clearly stated that he was the son of a priest; and the illegitimacy of his birth is sufficiently ascertained from a dispensation rendering him capable of receiving holy orders. Keith conjectures, with great probability, that he was the son of Gavin Lesley, rector of Kingusie, and likewise, as he supposes, official of that diocese.

Lesley prosecuted his studies in King's College, Aberdeen, where he took the degree of A.M. In the twentieth year of his age he became a canon of the cathedral churches of Aberdeen and Elgin. Having afterwards studied at Paris, Poitiers, and Toulouse, he returned to his native country in April 1554, and was soon after appointed professor of the canon law in the University of Aberdeen.

The progress of Protestantism, however, soon disturbed his peace; and in Knox's history we have an account of a conference between selected champions on either side, in which Lesley is described as making a sorry figure. Lesley's version is, however, somewhat different, and it is even affirmed that he and his associates were imprisoned in Edinburgh. On the death of Francis the Second, Lesley was despatched to France by the Earls of Huntley, Crawford, Athole, Sutherland, and Caithness, the Archbishop of St Andrews, the Bishops of Aberdeen, Moray, and Ross, with the view of enlisting Mary in their cause. He attended the queen on her return to Scotland, and was soon after admitted an ordinary judge of the Court of Session, along with a preference to the abbacy of Lindores, and the bishopric of Ross.

To the fortunes of the queen Lesley adhered with unshaken fidelity; and he is supposed to have been the individual who suggested an expedient for granting to the Earl of Bothwell an indirect pardon for the murder of the king; a crime to which there is the strongest moral evidence that the queen was an accessory, before as well as after the fact. On her escape from Lochleven she sent for him; but the battle of Langside crushed her hopes; and it was not till the following September that he visited her at Bolton Castle, and afterwards bore an important part in the negotiations between her and Elizabeth.

Lesina
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Lesley,
John.

Lesley,
John.

The scheme of a marriage between Mary and the Duke of Norfolk involved many of their adherents in danger and difficulties. Lesley was repeatedly examined before the English queen and council, and was confronted with the Earl of Leicester, who had likewise been implicated in the same transaction. Under suspicion of being accessory to the rising of the Earls of Northumberland and Westmoreland, he was placed under arrest, and was detained in custody for six weeks before he was subjected to any examination. Fresh evidence of his complicity in other transactions equally obnoxious soon after came to light, and after a long course of sickness and misfortune he was sent to the Tower, where he was subjected to the most needless cruelty, as well as harassed by the most inquisitorial investigations.

The condemnation of the Duke of Norfolk brought Lesley into fresh troubles. Of all the most material charges the proof seems in a great measure to have rested on what are described as the bishop's confessions, that is, the answers emitted during his repeated examinations after he had himself been taken into custody. On perceiving that their designs were discovered, Lesley had become more communicative, and had thus contributed to the ruin of a man whom he had so much contributed to entangle in dangerous schemes of ambition. While he was beset with such perils in England, the Regent sent Nicholas Elphinstone with a demand that he should be conveyed to Scotland; but the Duke of Montmorency brought instructions from France to intercede for his release; and this application was so far successful as to procure his removal to Farnham Castle, the seat of the Bishop of Winchester. During his confinement in the Tower, he had sought for consolation in study and meditation. There he had composed his *Piæ Consolationes*; and he was now permitted to transmit them to the queen, who devoted some of her prison hours to the task of translating a portion of it into French verse. He was induced to prepare a similar work, *Animi tranquilli Munimentum*, which he sent her in October 1573. In the meantime, he was not free from the apprehension of personal danger; the Earl of Morton having twice sent a diplomatic agent, Captain Cockburn, for the purpose of renewing the demand for the delivery of his person. Having some reliance upon his own eloquence, he now addressed to Elizabeth a Latin oration for the recovery of his liberty; and, whatever might be the effect of his classical pleading, he was soon afterwards released from his tedious confinement. The Bishop of Winchester, on receiving the necessary order, conducted him to London on 11th November. On the 16th he was brought before the council, at the house of the lord treasurer, and was informed that he would be permitted to proceed either to Scotland or France. The English statesmen seem to have been much inclined to treat him as they ultimately treated Mary herself; but although he was subjected to a long and arbitrary imprisonment, the ministers of Elizabeth never ventured to bring him to a formal trial.

In January 1574 he landed in France, where he remained till the following year, when Mary sent him on a mission to Gregory XIII., with the view of prosecuting her scheme of conveying her son to a Catholic country, and uniting him in marriage either with a daughter of the Emperor of Germany or the King of Spain. Lesley, however, was more usefully employed in preparing for the press his general history of Scotland, which was published at Rome in 1578. About this time hopes were entertained that through the influence of the Duke of Athole, the religion of Rome might regain its old footing in Scotland, and Lesley was despatched to the neighbouring coast of France to gain intelligence of any symptoms of a spreading change. He had the mishap, however, to be imprisoned by mistake at Falsburg, and he arrived in France (April

Leslie,
Charles.

1579) only to learn the death of the nobleman on whose exertions Mary and her party had built all their hopes. It was some consolation that the Cardinal de Bourbon, Archbishop of Rouen, soon afterwards appointed him suffragan and vicar-general of that diocese. In this station he continued for the space of fourteen years, and, principally for his intrepid conduct during the siege of Rouen, he was rewarded in 1594 with the bishopric of Constance, in Normandy. But from this preferment he appears to have derived no advantage; and the unhappy situation of public affairs in France induced him to seek another place of refuge. Directing his course towards Flanders, he reached Château d'Aussy, in the province of Artois, in the month of March, and afterwards proceeded to Brussels, where he experienced a friendly reception from the Archduke Ernest, governor of the Netherlands. By this prince he was rewarded with a pension of fifty crowns monthly, and the promise of a bishopric. The death of Ernest, however, frustrated this latter plan, and fast increasing sickness brought Lesley to the grave before he could reap any advantage from the favour of his successors. He died at Brussels 31st May 1596.

Of the works of Lesley we subjoin a catalogue:—

1. *A Defence of the Honour of the right highe, mightie, and noble Princesse Marie, Queene of Scotlande, and Dowager of France*, imprinted at London, 1569, 8vo. 2. *A Treatise concerning the Defence of the Honour, &c., made by Morgan Philippes, Bachelor of Divinitie*, an. 1570, Leodii, 1571, 8vo. This treatise he afterwards translated into Latin, as well as into French. 3. *Joannis Leslei Scotti, Episcopi Rossen. pro Libertate impetranda. Oratio, ad serenissimam Elizabetham Anglicæ Reginam*, Parisiis, 1574, 8vo. 4. *Joannis Leslei Scotti, Episcopi Rossen. libri duo: quorum uno, Piæ afflicti Animi Consolationes, divinaque Remedia; altero, Animi tranquilli Munimentum et Conservatio, continentur*, Parisiis, 1574, 8vo. 5. *De Origine, Moribus, et Rebus gestis Scotorum libri decem*, Romæ, 1578 and 1675, 4to. 6. *Congratulatio serenissimo Principi et illustrissimo Cardinali Alberto Archiduci Austriæ, &c., de fausto ac felici ejus Adventu ad Regimen Provinciæ Inferioris Germaniæ*, Bruxellæ, 1596, 8vo. 7. *A Discourse conteyninge a perfect Accompt given to the moste vertuous and excellent Princess, Marie Queene of Scots, and her Nobility, of his whole Charge and Proceedings during the time of his Ambassage, from his entres in England in September 1568, to the 26th of March 1572; in Anderson's Collections relating to the History of Mary Queen of Scotland*, vol. iii., Edinb. and Lond. 1727–8, 4 vols., 4to. 8. *The History of Scotland, from the death of King James I., in the year 1436, to the year 1461*, Edinb., 1830, 4to, edited by Thomas Thomson, from a MS. belonging to the Earl of Leven and Melville.

LESLIE, CHARLES, the author of a *Short and Easy Method with the Deists*, was born in 1650, in Ireland, where his father was Bishop of Raphoe, subsequently Bishop of Clogher. He graduated at Trinity College, Dublin. On his father's death, in 1671, removing to England, he enrolled as a student of law in the Temple, but soon after turned his attention to theology, and received orders in 1680. In 1687 he was appointed Chancellor of Connor, and began a long career of controversy by a debate with several popish champions, chosen for their office by Patrick Tyrrel, whom James II. had installed into the see of Clogher. His success on this occasion led him deeper into conflict with the government, and by implication with the king. Strange as it may appear, Leslie, although a bold advocate for the supremacy of law, was himself a firm believer in passive obedience; and declining at the Revolution to take the oaths of allegiance, was deprived of his benefice. In 1689 the growing commotions in Ireland induced him to remove to England, where he devoted himself to the defence of non-resistance, in several controversial pamphlets, and encountered, amongst other opponents, Burnet, Bishop of Salisbury. His incessant activity also led him into controversy with the Quakers, Jews, and Socinians. His best known work, *A Short and Easy Method with the Deists*, appeared in 1699; and in 1706, led to his being charged, somewhat paradoxically, with being vicious in argument, in such a way as to favour the progress of Popery.

Leslie,
Sir John.

In 1709 he was sent by several Jacobite gentlemen of fortune on a mission to Bar-le-duc, to convert the Pretender. That prince, however, foiled all his attempts, by forbidding him to converse about religion either with himself or with his priests. With the view of spreading Jacobite principles, Leslie addressed a letter from Bar-le-duc to a member of parliament in London, which was printed and circulated among the Jacobites in England. After the failure of the Pretender's expedition, Leslie accompanied him into Italy. Returning to England in 1721, he removed to Ireland, and died at Glaslough, Monaghan, 13th April 1722.

His principal works are,—*A View of the Times, their Principles and Practices*, London, 1750; *The Massacre of Glencoe*, London, 1703; *The Axe laid to the Root of Christianity*, London, 1706; *Querela Temporum*, London, 1695; *Theological Works*, 7 vols., Oxford, 1832, containing, among other controversial treatises, his *Short and Easy Method with the Deists*.

LESLIE, Sir John, Professor of Natural Philosophy in the University of Edinburgh, the son of a poor joiner or cabinet-maker, was born at the village of Largo, in the county of Fife, on the 16th of April 1766. In his early youth, being of feeble health, he was sent, when four years old, to a school kept by an old woman, and afterwards to a higher school. He received his first lessons in mathematics from his father and his eldest brother, and a slight knowledge of Latin at a school in the neighbouring town of Leven, which he attended for six months. The first person of any note who observed his precocious attainments, was Mr Oliphant, who became minister of Largo about the time when the boy had reached his eleventh or twelfth year. Struck with his knowledge of mathematical and physical science, he kindly lent him some scientific books; and he also strongly urged him, but without avail, to resume the study of Latin, for which he entertained at this time a strong aversion. He also became known to Professors Robinson and Stewart of Edinburgh; and by their advice he was, in his thirteenth year, sent to the University of St Andrews to study mathematics under Professor Vilant. On examination by the professor, he was found already qualified for the second or senior class; and at the close of the session he obtained a prize, and attracted the notice of the Earl of Kinnoull, then chancellor of the university, who proposed to his father to defray the expense of his son's education, on the condition that he should study for the Church. The proposal was readily embraced; and as a knowledge of Latin was now imperative, he commenced doggedly to study it, and, by the aid of a private teacher, qualified himself for entering the Humanity class. He also seems to have got rid of his strong dislike to the language; for no trace of it remained in his after life, and he is extremely fond of introducing classical quotations in his writings. His continued success during his second session secured the continued patronage of the chancellor, who invited him to Dupplin Castle. About the same time began his acquaintance with Playfair and Dr Small.

In 1783 or 1784, he quitted St Andrews, and, along with his fellow-student, James Ivory, proceeded to Edinburgh, where, though he formally entered the Divinity Hall, he contrived to devote his first session to the sciences, particularly to chemistry. In fact, he seems early to have relinquished all thoughts of the Church: a resolution, perhaps, hastened by the death of his patron, the Earl of Kinnoull, soon after his removal to Edinburgh. He continued to study here till the close of the session of 1787; and, as is customary with students of his limited means, devoted part of his time to private tuition. Acting as tutor to a young man nearly related to Adam Smith, he thus became known to that philosopher, who treated him kindly, and occasionally favoured him with directions as to his own pursuits. His first essay, "On the Resolution of Indeterminate Problems,"

composed about this time, was read to the Royal Society of Edinburgh by Mr Playfair, in 1788, and published in their *Transactions* for 1790.

In 1788 he accompanied, in the capacity of tutor, two young students of the name of Randolph, to Virginia. Here his agreeable and profitable sojourn was brought to an end, after the lapse of little more than a year, by the death of the father of his young friends; and after visiting New York and Philadelphia, he returned to his native place towards the close of the year 1789.

From some letters to his family, written about the time of his leaving America, he seems to have meditated trying his fortune in India, probably as a civil engineer; a notion that recurred afterwards without leading to any results. In January 1790, carrying, among other letters of recommendation, one from Adam Smith, he repaired to London, chiefly for the purpose of ascertaining what success he might expect from a course of lectures on natural philosophy; and the information he received soon satisfied him, as he says in a letter to one of his brothers, that "rational lectures would not succeed." He therefore employed himself for some time in writing for the *Monthly Review*, and in executing literary jobs delegated to him by his countryman, Dr William Thomson, author of the continuation of Watson's *History of Philip the Third*. In April 1790, he became tutor to his former fellow-students, the younger Wedgewoods of Etruria, in Staffordshire, where he remained till the close of 1792, in the enjoyment of a liberal salary, and of society at once agreeable and intelligent. He was at the same time assiduously employed in experimental investigations, and in completing a translation of Buffon's *Natural History of Birds*, which he had previously undertaken for a London bookseller. It was published in 1793, in 9 vols. 8vo. Though executed with fidelity and vigour, it was valued by himself in after life solely for having, by the sum which it procured him, laid the foundation of that pecuniary competency which his industrious and prudent habits soon enabled him, in a moderate degree, to attain.

In 1794, after a sojourn of some months in Holland, during which he acquired the German language, he returned to Largo. Here he remained for about two years, devoted to experimental researches, in the course of which he invented and perfected his Differential Thermometer: a contrivance suggested during his attempts to construct an accurate Hygrometer, and the parent, as it may be called, of his subsequent inventions,—the Hygroscope, Photometer, Pyroscope, Æthrioscope, and Atmometer. At a later period, when his name had attained a high degree of celebrity, he was accused of having plagiarized this invention, if not from Van Helmont, who died in 1644, at any rate from John Christopher Sturm, who died about sixty years later. But it is now, we believe, allowed, that this is just one of those curious cases so frequently found in the history of science, in which the inventor of a contrivance, partially anticipated by another, shows, by his skilful and fruitful employment of the disputed invention, how much he surpassed, and how little he needed the help of, him whom he is ungenerously supposed to have robbed of his legitimate honours.

In the spring of 1796, Mr Leslie accompanied his friend Mr Thomas Wedgewood on a tour through the N. of Germany and Switzerland, during which, as on all similar occasions, he was no less observant of the social, moral, and economical condition of countries he visited, than of their geological, meteorological, and physical aspects. On his return, he was probably engaged in his experimental pursuits, and divided his time chiefly between London and Largo, to which place, and to the society of his family, he ever was fondly attached. Early in the summer of 1799, he set out with an old college acquaintance on a tour through Denmark, part of Norway, and Sweden, and returned to Eng-

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land about the end of November. In the following year appeared, in Nicholson's *Philosophical Journal*, "A Description of an Hygrometer and Photometer;" a paper "On the Absorbent Powers of the Different Earths;" and "Observations and Experiments on Light and Heat, with Remarks on the Inquiries of Dr Herschel on these objects." A series of more extended investigations, which he carried on while residing at Largo, resulted, in 1804, in the publication at London of his *Experimental Inquiry into the Nature and Propagation of Heat*; a work which may be considered as a development of his essay on *Heat and Climate*, read at two successive meetings of the Royal Society of London in 1793. The originality and boldness of the peculiar doctrines of the *Inquiry*, and the number of new and important facts disclosed by its ingenious experimental combinations, conspired to render it an object of extraordinary interest in the scientific world; and, indeed, it must ever be viewed as constituting an era in the history of that branch of physical science which forms its subject. The Royal Society of London unanimously adjudged to its author the Rumford Medal, appropriated as the reward of discoveries in that recondite province. Although paradoxical in many of its theories, defective in its arrangement, and over-ambitious in its style, this work is almost unrivalled in the entire range of physical science, for its indication of vigorous and inventive genius.

Previous to this period of his life, Leslie had twice appeared as a candidate for an academical chair; first in the University of St Andrews, afterwards in that of Glasgow, and on both occasions without success. Early in the year 1805, he became a candidate for the mathematical chair at Edinburgh, vacant through the promotion of Playfair to the chair of Natural Philosophy. His principal competitor, Dr Thomas Macknight, a man of respectable attainments, was one of the ministers of Edinburgh, and was supported by the majority of the city clergy. These, blinding perhaps their better judgment by an excessive zeal for the cause of their fellow-minister, fastened on one of Leslie's notes, in his essay on *Heat*, in which, after complimenting Hume's philosophical talent, he says, "that the unsophisticated notions of mankind are in perfect unison with the deductions of logic, and imply nothing more at bottom, in the relation of cause and effect, than a constant and invariable sequence." Alleging that the town-council were bound, according to the fundamental charter of the college, to act with the advice of the ministers in electing professors, they preferred a formal protest, accusing Leslie of having, in this note, "laid a foundation for rejecting all the argument that is derived from the works of God, in proof of His Being or Attributes." The patrons neglected their advice; and Leslie, to the great joy of all liberal minds, was, in March 1805, elected to the Mathematical chair. The case, however, was carried before the General Assembly; and after a memorable debate of two days, was dismissed, on the 23d of May, "as vexatious." When Leslie was informed of the charge, he exculpated himself in a very pointed letter, which was laid before his opponents, by stating, that his observations "referred entirely to the relation between cause and effect, considered as an object of physical examination."¹ This was a sufficient defence of his orthodoxy, and ought to have stopped the prosecution before the Assembly.

Entertaining lofty notions of the dignity and utility of his new vocation, he discharged its duties with great ardour. Though the bent of his genius lay more to physics than to pure mathematics, he had cultivated the study of geometry with kindred relish, and with an admiration, in particular, of the analytical investigations of the ancient geometers, which led to his happiest essay in that science. Of his *Course of Mathematics*, the first volume, comprising *Ele-*

ments of Geometry, Geometrical Analysis, and Plane Trigonometry, was published, in 1809, at Edinburgh, and republished in 1811, and in 1817. His own favourite portion, on *Geometrical Analysis*, has been extolled by the most unsparing critics of the first part, and was speedily translated into French and German. He reproduced it, in 1821, with considerable emendations, in the second volume of his *Mathematical Course*, which also contains the *Geometry of Curve Lines*. The want of a third volume, on *Descriptive Geometry* and the *Theory of Solids*, which was part of his original design, left his *Mathematical Course* incomplete. An abridgement of the first volume appeared in 1828, under the title of *Rudiments of Plane Geometry, including Geometrical Analysis, and Plane Trigonometry*. In connection with his mathematical works, we may here mention the profound and learned treatise, published in 1817, on the *Philosophy of Arithmetic*,—a republication, with considerable alterations and additions, of one of the numerous articles contributed by him to the *Supplement* of this Encyclopædia.

Notwithstanding the labours of the Mathematical chair, Leslie continued his experimental inquiries; and in June 1810, some experiments previously suggested in the course of his researches with his Hygrometer, led him to the discovery of that beautiful process of Artificial Congelation, by which he was enabled to produce ice, and even to freeze mercury at pleasure. This process consists in a combination of the powers of rarefaction and absorption, effected by placing a very strong absorbent under the receiver of an air-pump. Some endeavours were made, as in the case of the Differential Thermometer, to transfer the merit of this new discovery to a gentleman of the name of Nairne. The claim for him was founded on a paper published in 1777, in the *Transactions* of the Royal Society of London; from which it appeared that he was acquainted with the facts, that evaporation produces cold, and that sulphuric acid, the absorbent employed by Leslie, imbibes moisture. The best vindication of Leslie's claims is furnished by the admitted fact, that with Nairne's paper before them for a long course of years, the scientific world remained utterly ignorant of any such process till the date of Leslie's discovery; and even after his description of that process the most distinguished experimentalists of the capital failed in their trials of it, till it was performed there by himself in the ensuing summer!

In 1811 he performed the experiment in London before a meeting of some members of the Royal Society, and others. The discovery was announced in the same year, in the *Memoirs* of the French Institute; and the process itself was afterwards exhibited in presence of that body, by M. Pictet and M. Gay-Lussac. His experiments and views on this subject in 1813 he explained at considerable length in a small volume published at Edinburgh, and entitled, *A Short Account of Experiments and Instruments depending on the Relations of Air to Heat and Moisture*. Closely connected with the subject of this treatise, was an ingenious paper, published in 1818, in the *Transactions* of the Royal Society of Edinburgh, under this title: *On certain Impressions of Cold transmitted from the higher Atmosphere; with a description of an Instrument adapted to Measure them*. The Æthrioscope is the instrument here alluded to.

In the autumn of 1814, Leslie travelled through France and the Netherlands, where the ever-fresh beauty of the scenery, combined with the meeting of such men as Humboldt, Laplace, Berthollet, and Baron Zach, tended to render that short tour of six weeks more than usually agreeable.

The celebrated *Supplement* of this Encyclopædia, commenced in 1815, and completed in 1824, was greatly in-

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¹ See Professor Stewart's *Short Statement*, p. 36, and *Report of the Debate in the General Assembly*, p. 16.*

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debted to Leslie for his valuable contributions, and for the ever-ready counsel which his extensive and minute information could afford to its editor. He also contributed several articles to the *Edinburgh Review*, the principal of which are,—those on the *Physical and Chemical Memoirs of the Society of Arcueil*; on the *History of the Barometer*; on *Delambre's work on the Arithmetic of the Greeks*; on *Von Buch's Travels*; on *Humboldt's Physical view of the Equatorial Regions*, and on *His Travels*; and on the *Attempts to discover a North-West Passage to Asia*.

In the year 1819, on the death of Playfair, he was promoted to the chair of Natural Philosophy, a sphere more propitious to his peculiar genius. One of the first cares of his new situation was the extension of the apparatus for that greatly enlarged series of experiments which he thought necessary for the illustration of the course. This, indeed, was an object from the first to the last year of his incumbency ever present to his mind; and it was through his exertions that the means of experimental illustration, in the Natural Philosophy Class, were for the first time made worthy of the place. As a teacher both of mathematics and of natural philosophy, he wanted that sequence of ideas and perspicuity of exposition which can alone lead an undisciplined intellect through complicated doctrines, and thus attain the highest success in tuition. Still, his numerous experiments, the celebrity of his name, and his well-known extraordinary powers, concurred, with great simplicity and affability of manner, to secure the respect of his students, and to sustain the fame of the University. In 1823 he published, chiefly for the use of his class, his *Elements of Natural Philosophy*; being the first volume of a course intended to extend to three, and to exhibit a comprehensive view of the principles of that congeries of sciences which we are accustomed to class under the above term. A second edition of this volume, the only part of the plan ever completed was published in 1829, with corrections and additions.

In the summer of 1823, he accomplished his long-cherished design of visiting Italy, and especially Rome; but these objects of his tour appear to have disappointed his expectations. Two years after this, another tour which he made on the Continent, seems to have been confined to France, the Netherlands, and Holland, which for the most part he had traversed before.

The only important production of Mr Leslie's latter years, and his crowning benefaction to this work, was his *Discourse on the Progress of Mathematical and Physical Science during the Eighteenth Century*; which constitutes the Fifth Dissertation in the first volume of this present edition. His arrangement of his materials, and his view of the whole subject, is comprehensive, vigorous, and spirited; while the greater ease and perspicuity of its style render this the most agreeable of all his writings.

The volumes of the *Edinburgh Philosophical Journal*, published between 1824 and 1829, contain some small contributions from him, entitled *Remarks on the Light of the Moon and of the Planets*; *Enumeration of the Instruments requisite for Meteorological Observations*; *Letter on the Coniometer*; and *Observations on the Theory of Compression, applied to discover the Internal Constitution of our Earth*. Even these small treatises display all the characteristic boldness and poetical dress of his speculations.

Early in the year 1832, on the recommendation of Lord Brougham, then Lord High Chancellor, he was created, along with several other eminent men of science, a Knight of the Guelphic Order. He was also a member of the Royal Society of Edinburgh, and in 1820 had been elected a corresponding member of the Royal Institute of France, the only distinction of the kind that he valued.

For a few years before this period, he had passed all his intervals of leisure at Coates, a small estate which he had

purchased near Largo, and which he loved to decorate and improve. In the last days of October, whilst engaged in superintending some improvements on his grounds, he exposed himself to wet, and caught a severe cold. This was followed by erysipelas in one of his legs, which, owing to his contempt for medicine, and an excessive confidence in his strength and durability, he neglected, and again imprudently exposed himself in the fields. He soon afterwards became dangerously ill, and expired at Coates, on the evening of Saturday, Nov. 3, 1832, in the sixty-seventh year of his age.

Surpassed by a few of his contemporaries in the same walks of science, in profundity of understanding, in philosophical caution, and in logical accuracy, he rivalled them all in that creative faculty, which discovers often by an intuitive glimpse the hidden secrets of nature, and in that subtlety and reach of discernment which seizes the finest and least obvious qualities and relations of things, and ministers to new and unexpected combinations of her powers. Possessing the powers of judgment and reason in less efficiency, he was often led, in his speculations, to results glaringly inconsistent. His credulity, often shown in affairs of ordinary life, induced him too often to indulge in unwarrantable applications of mathematical reasoning, to subjects altogether foreign to that science. For example, he finds an analogy between circulating decimals and the lengthened cycles of the seasons! False, however, though many of his theoretical notions may be, his exquisite instruments, and his experimental combinations, will ever attest the utility, no less than the originality of his labours, and continue to act as aids to farther discovery. His information, ample and accurate, not only in science, but in the general range of subjects, and especially in Scottish history, becomes more remarkable from its co-existence with his great power of invention,—a union by no means common. His conversation, unlike his writings in point of expression, was simple, unaffected, and correct. It had no wit, little repartee, and no fine turns of any kind; but it had a strongly original and racy cast, and was replete with striking remarks and curious information. His moral character was slightly blemished by a tendency to avarice, unbecoming in a philosopher, and by an occasional reluctance to acknowledge kindred merit; but these defects were more than counterbalanced by his child-like simplicity, social disposition, warmth of affection, and unchanging serenity of temper. He was never married. In person he was somewhat under the middle size, and corpulent, but strong and well limbed; and though his face was large and florid, there were about his eyes and forehead the distinct traits of no ordinary man. There is a bust of him by Joseph; a portrait, of the ordinary size, taken a few years before his death, by Wilkie; and a head, drawn at an earlier period, by Henning, which presents a striking likeness.

See SIXTH PRELIM. DISSERTATION, chap. vi., § 5.

Besides the works already mentioned, Leslie wrote *Observations on Electrical Theories*, published, in 1824, in the *Edinburgh Philosophical Journal*; and the articles in the seventh edition of this Encyclopædia, on *Achromatic Glasses*; *Acoustics*; *Aeronautics*; *Andes*; *Angle*, and *Trisection of Angle*; *Arithmetic*; *Atmometer*; *Barometer*; *Barometrical Measurements*; *Climate*; *Cold and Congelation*; *Dew*; *Interpolation*; and *Meteorology*.

LESLIE, a manufacturing town and borough of barony of Scotland, county of Fife, on an eminence on the left bank of the Leven, 10 miles S.W. of Cupar. It is neatly built, consisting chiefly of one street, and contains a parish and free church, and several dissenting chapels. The inhabitants are chiefly employed in flax spinning, bleaching, cotton spinning, &c. Pop. (1851) 1342.

LESSING, GOTTHOLD EPHRAIM, was born 22d January 1729, at Camenz, in Saxony, where his father, a pious and staunch Lutheran, was minister. He was the eldest son

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of a numerous family, and received his early education at home. At the grammar school of Meissen, where he received the surname of "admirable," he distinguished himself, not merely by extensive reading, but by clear and independent thought. A paper sent to his father, at the new year of 1743, when he was only a boy of fourteen, and which was entitled, *On the Similarity of one Year to another*, discusses such high themes as the possibility of a golden age, and the doctrine of human deterioration. From Meissen he was sent to the University of Leipsic, where his parents designed that he should study theology. The lectures of Ernesti and Gellert, however, were spent on him in vain. Along with Christoph Mylius, his early bosom friend, and several other gay companions, he conceived a violent passion for the drama, and gave himself up to fencing, dancing, the theatre, and debt. Some torn pages of a comedy, however, found their way to Camenz in his box at Christmas, and the young dramatist was ordered home. To soothe his mother's anxieties, he laid his comic studies aside, and kindly wrote her a sermon. At Easter, he returned to college, with the view of studying medicine; but his old passion broke out anew, and carried everything before it. Finding his debts now grudgingly paid, and the supplies in hourly danger of being cut off, he followed his friend Mylius to Berlin, where they began a dramatic quarterly (*Beiträge zur Historie des Theaters*), which, however, only reached its fourth number. So little conscious was he of the peculiar service which he was destined to render to the literature of his country, that we find him about this time busily engaged in translating Klopstock's *Messiah* into Latin.

At the request of his parents, he resided for some time at Wittenberg with his brother, who was studying for the church; but he soon returned, unchanged in the bent of his genius, to Berlin, where, with Moses Mendelssohn and Nicolai, he plunged into a life of incessant literary activity. With the former he wrote his essay on Pope as a metaphysician (*Pope als Metaphysiker*), and with both he started the *Bibliothek der Schönen Wissenschaften*. In 1755 he removed from Berlin to Leipsic, whence he intended to travel into England; but he got no farther than Holland, and he retraced his steps to Leipsic soon after. In 1759 appeared those *Letters on Literature*, written in conjunction with Mendelssohn and Nicolai, which may be said truly to form an epoch in German literature. In 1760 Lessing went to Breslau, as government secretary to General Von Tauenzien, probably with the view of recruiting his health by change of scene, but more directly to fill his purse, which, even in its emptiness, had been generously open to his brother's wants. A new passion for gambling, however, robbed him of all, except his taste for study. After the drudgeries of his office were over, the busy writer of *Laokoon* might be seen bending over the *faro-table*, the perspiration starting from his brow, as he rushed into the thankless game with a strange impetuosity of mingled despair and superstition. In 1769 he went to Hamburg, as director of the theatre; but his love for the stage was now too cold to be rekindled, and most of his time was spent in antiquarian research. Here he wrote his letters to Klotz, and here he formed his intimacy with the pastor Götze, with whom he afterwards fought his most memorable polemic. All his exertions in this capacity scarcely kept poverty at bay, and he had serious thoughts of quitting Germany, to beg or starve more pleasurably at Rome, when his friend Ebert procured him the office of librarian of the Wolfenbüttel Library. This lifted him to a sudden affluence of L.90 per annum, with a free house, and firewood. Of the rare treasures of the library he has himself given an account; and he was scarcely installed in office, when he stumbled on a manuscript, by Berengar of Tours, in which he defends his opinions against Lanfranc; and its publication set at rest the doubts and

denials of his existence, long eagerly circulated in the Church of Rome.

In 1774 began the publication of the *Wolfenbüttelsche Fragmente*, a series of papers by an unknown hand, in which the writer attacks the historical basis of Christianity with a phalanx of arguments, which have since been spread out into a thin line by Strauss. These papers were long attributed to the pen of the librarian himself; but Samuel Reimarus, on his deathbed, set the question at rest by claiming them for his own. After a short and unsatisfactory visit to Italy and Vienna, Lessing returned to Wolfenbüttel; and, in 1776, he married Madame König, a lady whom he had betrothed at Hamburg, in hope of better days to come. His happiness, however, was not of long duration. She died in childbirth, in the spring of 1778, and left him to drown his grief in incessant literary toil. His old friend Götze, who had stepped into the arena with a pamphlet against the *Fragmente*, was the first to feel the edge of his sharp, clear, nervous prose; and so fierce was the assault, that the ministry of Brunswick, in alarm, prohibited the prolongation of the contest. Lessing, however, continued for some time to evade the prohibition by printing at Berlin, but hit at length upon a more deadly expedient. When a youth at college, he had been bold enough to introduce upon the stage scenes and personages foreign to the drama of his country. *Der Freigeist*; *Der Mysogyn* (the woman-hater); and *Die Juden*, are among the titles of plays written by him when a student at Leipsic. These were followed, in later life, by *Miss Sarah Sampson*; *Emilia Galloti*; *Philotas*; *Minna von Barnhelm*; and several others. Unwilling now to leave the sacred retreat of Wolfenbüttel, a martyr to a single mode of controversy, he dressed his opinions for the stage, and, in the mask of *Nathan the Wise*, spoke his estimate of Christianity with Brahminic calmness to the world. In this dramatized theology, he has probably given to his country a more powerful impress than any of its mighty thinkers from Luther to Schleiermacher. The *Education of the Human Race* (*Erziehung des Menschengeschlechts*), and one or two minor works, all posthumous, were the only contributions which he made, after its publication, to the progress of opinion.

With slow and leaden steps, exhausted and cheerless, Lessing sank into the grave. His few hours of activity were alternated with long and dreary fits of somnolency, from which he struggled in vain to free himself, till death somewhat prematurely closed his career, 15th February 1781. His works have been several times collected. The best edition is that by Wendelin von Maltzahn, Leipsic, 1852, and not yet (1857) completely published. The principal sources of information in regard to his life, are to be found in a short sketch by his nephew, and in the voluminous but somewhat undigested biography of Danzel.

Lessing stands as one of the great landmarks in the literary history of Germany. He followed Klopstock in evoking a national literature, which retained its elastic freedom till Goethe once more subjected it to foreign chains. While Klopstock, however, only pointed the way, Lessing led the advancing host; and the sublime tranquillity of the one was soon lost in the restless activity of the other. Lessing cannot be called a poet, and he is perhaps scarcely more entitled to be called a philosopher. He is more like a border chief treading restlessly the confines of both with fearless familiarity and a sublime but solitary lawlessness. Freely to rove in every path of human inquiry was to him a more royal prerogative than to wield the sceptre of a fixed dominion. In his athletic scepticism we see his superstitious horror of rest on its tragic side; but even in his most playful dramas and critiques there is a suppressed dialogue in every sentence, an undertone of conflict, generally faint as a dream, but swelling often into a wild and painful distinctness. In this respect he betrays a hidden nature immeasurably nobler than Voltaire,

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L'Estrange whose careless wit Lessing despised while wielding at will a keener wit of his own. No exposition of his opinions can more adequately represent the spring of his life than a saying which he repeated more than once, "that if God should hold truth in his right hand, and in his left, doubt, or the chase after truth, with the danger of wandering to and fro for ever in its search, and should bid him choose between the two, he would grasp the left hand and beg for doubt, with the words, 'Father, give me this—pure truth is for thee alone;'" and no comment can be more striking than the fact revealed by Jacobi, that when body and mind were both failing, the author of the *Education of the Human Race* was secretly resting his faith on the pantheism of Spinoza.

L'ESTRANGE, SIR ROGER, a political writer of the seventeenth century, was the youngest son of Sir Hamond L'Estrange, of Hunstanton Hall, Norfolk, and was born at the family seat in 1616. After receiving a liberal education, he commenced his public career by attending Charles I. on his expedition against the Scots in 1639. During the civil war he was a zealous royalist, and in 1644, having received a commission from the king, appointing him governor of Lynn, he endeavoured to wrest that town by surprise from the parliamentary forces, but was betrayed by two of his accomplices and lodged in prison. He was tried before the city court-martial, was condemned to death as a traitor, and sent to Newgate. As he had friends, however, in both houses of parliament, he was reprieved; and after lying in prison for nearly four years, was allowed to escape beyond the sea. Availing himself of the Act of Indemnity that had been passed in 1652, he returned to England in 1653; and after loitering about Whitehall for some time, and making personal application to Cromwell, he was allowed to live unmolested. This tampering with the ruling party was afterwards a galling weapon in the hands of his enemies, and was perhaps one of the reasons why the only reward he received from Charles II., after his restoration, was the invidious office of licenser of the press. Nevertheless, in several pamphlets which he published about this time, and in the *Public Intelligencer*, a newspaper which he started in 1663, he was a slavish supporter of the crown. His other paper, the *Observer*, begun some time after the Popish plot, was the organ of the Tory party, then on the ascendant, and was designed to exculpate the king from the charge of leaning towards Popery. On the accession of James II., he was knighted for "his unshaken loyalty to the crown," and sat in the parliament of 1685. When the king propounded his doctrine of toleration, L'Estrange, hesitating for the first time to agree with royalty, discontinued his *Observer*. At the Revolution, he was deprived of the office of licenser of the press; and shortly afterwards becoming imbecile, he died on the 11th of December 1704.

His political pamphlets, intended as they were, to suit the taste of the common people, swarm with vulgarisms and coarse and abusive epithets. He wrote also translations of the following works:—*Josephus' Works*, *Cicero's Offices*, *Seneca's Morals*, *Erasmus's Colloquies*, *Æsop's Fables*, *Quevedo's Visions*, *Bona's Guide to Eternity*, *Five Love-Letters from a Nun to a Cavalier*.

LETTERKENNY, a market-town and river port of Ireland, county of Donegal, on the Swilly, 18 miles S.W. of Londonderry. It consists of a single street and a square, and contains an Established church, a Roman Catholic, and several Presbyterian chapels; a national and other schools, a fever hospital, dispensary, and bridewell. Considerable trade is carried on, chiefly in agricultural produce, at the weekly market on Friday, and in exportation by the Swilly. Pop. (1851) 2180.

LEUCA, CAPO DI (*Salentinum Promontorium*), a cape on the coast of Naples, province of Terra di Otranto, forming

the extreme S.E. point of the Italian peninsula. N. Lat. Leucadia 39. 48., E. Long. 18. 22.

LEUCADIA, originally part of the mainland of the Greek continent, forms now one of the Ionian islands, being separated from the coast of Acarnania by a narrow artificial channel. The original inhabitants of the peninsula were Teleboæ and Leleges, but it was afterwards peopled by Acarnanians. In the seventh century before Christ, a new town called Leucas, a name derived from its white cliffs, was founded by the Corinthians under Cypselus, in the N.E. of this island near the isthmus. These colonists cut the channel through the isthmus, converting the peninsula into an island. This canal was afterwards choked up with sand, so as to prevent the passage of ships, which had accordingly sometimes, during the Peloponnesian war, to be conveyed across the isthmus. We learn from Polybius, that it was in this state in B.C. 218, but it was subsequently restored, and a stone bridge thrown across it,—one probably of the many works of Augustus, for facilitating communication throughout his extensive empire.

The Leucadians had three ships at the battle of Salamis, and, like most of the Dorian states, sided with the Lacedæmonians in the Peloponnesian war. In the contest between Philip of Macedon and the Romans, it took part with the former, but was reduced by the Romans after a gallant defence. It long continued to be a place of considerable importance, and was very early made the seat of a Christian bishopric. In A.D. 1467 it was seized by the Turks, by whom it was ceded to the Venetians in 1718. In 1810, the fort, called Santa Maura, was taken from a French garrison which had occupied it, after a siege of several weeks, by a detachment of English troops. The fort, which was originally built by the Turks, was ruined by an earthquake in 1825, and has not since been repaired. The island still continues in the possession of the English.

Leucadia is about 20 miles in length, by from 5 to 8 in breadth, for the most part of a rugged and uncultivated aspect, but rather more fertile and populous in the southern districts. It consists of a range of limestone mountains, the highest ridge rising about 3000 feet above the level of the sea, terminating in a bold headland on the N.E., whence the coast runs in a S.W. direction to the celebrated promontory of Sappho's Leap, the ancient Leucates. The island is visited by a rather serious earthquake about once in twenty years. Slight shocks occur almost every month.

The present chief town of Leucadia is Amaxichi, situate a mile and a half to the N.W. of the ancient city of Leucas. It is an ill-looking town, built in the most unhealthy part of the island, on the edge of a large lagoon; the houses, on account of the frequency of earthquakes, being seldom more than two storeys high. Its population is about 4000.

LEUCIPPUS, the founder of the Atomic Theory in Greek philosophy. The period in which he lived is unknown, but is generally supposed to have been in the fifth century before the Christian era. Elis, Abdera, and Miletus, have been severally assigned by different authors as his birthplace. According to Diogenes Laertius, he was the teacher of Democritus. By others he has been called the disciple of Pythagoras, of Melissus, and of Zeno the Eleatic. Aristotle, however, is not alone in asserting that the first principles of the atomic theory, though evolved by Leucippus, were particularly expounded by Democritus. In explaining the creation of the universe, they supposed that the two great principles in nature were a *vacuum* and a *plenum*. The *plenum* consisted of *atoms* infinite in number, and, as their name implies, indivisible. As a necessary consequence of their being many and not one, the atoms floated in the midst of the *vacuum*. Possessing, also, as their essential qualities, motion, solidity, and form,—in virtue of the first they began a rotatory movement; in virtue of the second they were prevented

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from merging into one simple body; and in virtue of the third, those of similar figure attracted each other. The atoms that were spherical, and consequently more moveable, meeting together formed fire; those that were not spherical formed, in their aggregations, the other three elements, air, earth, and water. The subtlest and most refined of the fire-atoms constituted the soul. Life, too, having been identified with respiration, was explained as being merely the flux and reflux of these spherical atoms. Here Leucippus seems to have stopped; but Democritus, following out these principles to their natural results, arrived at his system of Psychology, and at his theory of the First Cause, which he rather obscurely calls *Destiny*. The opinions afterwards became identified with the doctrines of Epicurus. See *EPICUREAN PHILOSOPHY*.

LEUCTRA, a village of Bœotia, situate between Thespiæ and Plateæ, in the territory of the former, celebrated as the scene of the great battle between the Spartans, commanded by Cleombrotus, and the Thebans, under Epaminondas, in which the former were defeated, and the supremacy of Sparta finally overthrown. See *SPARTA*.

LEUK, a village of Switzerland, canton of Valais, on the right bank of the Rhône, 15 miles E.N.E. of Sion. Seven miles N. of this village, at the head of the Lala torrent, and 4500 feet above sea level, are the Baths of Leuk, much resorted to by invalids. They are supplied with water from some hot springs which issue from the earth here at a temperature of about 124° Fahrenheit. The waters are slightly saline, and owe their value more to the mode of using them than to any intrinsic property of their own. Pop. of village, 620.

LEUSDEN, JOHN, a celebrated biblical writer, was born at Utrecht in 1624. After he had studied languages and mathematics at Utrecht, he repaired to Amsterdam to perfect his knowledge in Hebrew, by conversation with the rabbin. Here his attainments in oriental languages soon became so conspicuous, that in 1649 he was appointed Professor of Hebrew in his native city. After gaining the reputation of being one of the best Hebrew scholars of his day, he died in 1699.

His most important works are,—*Philologus Hebræus, editio tertia*, Utrecht, 1686; *Philologus Hebræo-Mixtus, editio quarta*, 1739; *Philologus Hebræo-Græcus, editio secunda*, 1685; *Onomasticum Sacrum*, Leyden, 1665 and 1684; *Clavis Hebraica et Philologica Veteris Testamenti*, Utrecht, 1682; *Novi Testamenti Clavis Græca cum Annotationibus Philologicis*, Utrecht, 1672; *Compendium Biblicum Veteris Testamenti*, 1694; *Compendium Græcum Novi Testamenti*, London, 1680; *Jonas Illustratus*, Utrecht, 1652 and 1692; *Joel Explicatus per Paraphrasim Chaldaicam*, Utrecht, 1657.

LEUTSCHAU, a town of N. Hungary, capital of the county of Zips, an affluent of the Hernad, 120 miles N.N.E. of Pesth. The town is ill laid out, with narrow and irregular streets. The chief public buildings are the town-house, containing a gallery of paintings, the church of St Jacob, with an organ said to be the largest in Hungary. There are a Roman Catholic and a Protestant gymnasium, the latter the oldest in Hungary. Mead and linen are made here; and a trade in fruit, saffron, and hops is carried on to some extent. Pop. 5500.

LËUWENHOECK, ANTHONY VAN, a famous naturalist, was born at Delft, in Holland, in 1632. At first he was well known as a grinder of optical glasses; and though destitute of a liberal education, was induced to use the excellent microscopes which his skill had made, in examining the textures and fluids of animal life. His success in anatomy and physiology was soon so marked, that an account of some of his discoveries was published through the influence of Dr Grew in the *Philosophical Transactions of the Royal Society of London*, of which he became a Fellow

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in 1680. His numerous contributions to the records of that society are comprised between Nos. 94 and 380. In 1697 he was elected a corresponding member of the Academy of Sciences at Paris; and in the following year, his fame had become so far-spread, that Peter the Great, when passing through Delft, sent for him and requested to see his "admirable microscopes," and the wonderful secrets which they revealed. The naturalist showed him the circulation of the blood in the tail of an eel. Lëuwenhoeck died at his native place on the 26th of August 1723.

One of his most important investigations was that by which he discovered, in 1690, that the arteries and veins were continuous, an opinion, however, which he had contradicted in a memoir communicated to the Royal Society of London in 1686. The theory of the fermentation of the blood then universally held, he refuted by proving experimentally, that there were no bubbles of air in the blood, and therefore there could be no fermentation. He experimented, but with little success, on the form of the globules of the blood, and likewise on the brain and nerves, which he showed in 1717 to be of fibrous texture, with blood-vessels interspersed between the fibres; a view which has since been discovered to be very nearly correct. Another object of his study was the crystalline lens, the different coats of which he described with accuracy, illustrating his descriptions with figures. He also examined the spermatic animalcules, and asserted that he had discovered them; a claim which was contested with Ludwig, Hamm, and Hartsaeker. Others of his investigations ended in mistakes, owing partly to his deficient erudition, and partly to a certain native stubbornness, which led him to consider a confession of error to be degrading.

Lëuwenhoeck contributed 26 papers to the *Memoirs of the Academy of Sciences*. A collection of his works, printed (for the most part separately) in Dutch at Delft and at Leyden, were translated into Latin under the title of *Arcana Naturæ delecta*, Delft, 1695–1699. The best collection of his works, translated into Latin, consists of his Correspondence, 2 vols. 4to, Leyden and Delft, 1719; and *Arcana*, 2 vols. 4to, printed at Leyden in 1722.

LEUZE, a manufacturing town of Belgium, province of Hainault, on the Tournay and Ath Railroad, 12 miles E. of the former. The town is well built, and its streets are clean. It manufactures cotton stuffs, linen, and hosiery; and has breweries, bleaching and dye works. Pop. (1850), 5842.

LEVANT (Italian *Levante*, the East), a term originally used by the Venetians and Genoese to designate the coasts of the Mediterranean E. of Italy; but now commonly applied to the coasts of Asia Minor, Syria, and Egypt, on the Mediterranean. See *MEDITERRANEAN*.

LEVANTE, a Sardinian province. See *GENOA*.

LEVANTO, a seaport and fortified town of the kingdom of Sardinia, on the E. shore of the Gulf of Genoa, 12 miles N.W. of Spezia. The town, though dirty, contains several fine edifices, the chief of which is the church consecrated in 1463, and built after the style of the Genoa cathedral. Wine and oil are exported hence in considerable quantities. The former is made at Vernazza, an adjoining village. Pop. 4600.

LEVEE (French, *lever*, to rise), is the name given to the ceremonial of receiving visitors on state occasions. The name is derived from the fact of the visit taking place in the morning, *i.e.*, shortly after rising. A levee may be for gentlemen only, or for ladies only; whereas at a "drawing-room" both may be present.

LEVEL, and LEVELLING. See *SURVEYING*.

LEVEN, a burgh of barony and sea-coast town of Scotland, Scoonie parish, Fifeshire, on the Firth of Forth, and at the mouth of the Leven Water, 18 miles N.N.E. of Edinburgh. Flax spinning and the manufacture of linen

Leven
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Levites.

and sailcloth form the chief occupations of its inhabitants. There are also iron-foundries, bleaching-works, brick and tile works, an ochre manufactory, and a rope-walk, with collieries and stone quarries in the vicinity. The harbour is supplied with a quay, and admits vessels of 300 tons at high spring tide. By railway the town has communication with Edinburgh, Perth, and Dundee. Pop. (1851) 2083.

LEVEN, *Loch*, an arm of the sea on the W. coast of Scotland, branching off from Loch Linnhe eastwards, and separating the counties of Argyll and Inverness. It is 12 miles in length, and from half a mile to 1 mile in breadth.

LEVEN, *Loch*, a lake of Scotland, Kinross-shire. See KINROSS-SHIRE.

LEVITES, the descendants of Levi, through his sons Gershon, Kohath, and Merari, whose descendants formed so many sub-tribes or great families of the general body. In a narrower sense the term Levites designates the great body of the tribe employed in the subordinate offices of the hierarchy, to distinguish them from that one family of their body—the family of Aaron—in which the priestly functions were vested.

In the wilderness the office of the Levites was to carry the tabernacle and its utensils and furniture from place to place, after they had been packed up by the priests. In this service each of the three Levitical families had its separate department; the Gershonites carried the hangings and cords of the tabernacle, for which they were allowed two wains, each drawn by four oxen. The Kohathites carried the ark, the table of shew-bread, the candlestick, the two altars, and such of the hangings as belonged to the sanctuary; for this they had no wains or oxen, the whole being carried upon their shoulders. The Merarites had charge of the substantial parts of the tabernacle—the boards, pillars, bars, bases, &c., and also all the ordinary vessels of service—for which they were allowed four wains and eight oxen. In this manner they proceeded in their journeys; and when they settled in a place, and had erected the tabernacle, the different families pitched their tents around it in the following manner: the Gershonites behind it on the W., the Kohathites on the S., the Merarites on the N., and the priests on the E. They all assisted Aaron and his sons in taking care of, and attending on the Tabernacle, when it was pitched; but they were allowed to take no part in the services of the altar.

This was the nature of their service in the desert: but when they entered the land of Canaan, and the tabernacle ceased to be migratory, the range of their service was considerably altered. While part attended at the tabernacle, the rest were distributed through the country in the several cities which were allotted to them.

In the time of David, when the number of the priests and Levites had much increased, a third and very important alteration was effected. Like the priests, the Levites were also divided into twenty-four courses. In the Book of Chronicles we have four times twenty-four courses of Levites mentioned, but all their employments are not distinctly stated. The most conspicuous classification is that of twenty-four courses of porters and servitors, and twenty-four of musicians.

The office of the porters was to open and shut the doors and gates of the temple courts, at which they also attended throughout the day to prevent the entrance of any harmful or unclean person or thing. They had also the charge of the treasure-chambers in their respective wards; for we find four of the chief porters holding this trust in 1 Chron. ix. 26.

Besides acting as porters and servants during the day, we learn that they were also the guards of the temple. Minute particulars with reference to the second temple are given by the rabbinical and other authors; and, so far as they are correct, which they seem to be in substance, they may be supposed to apply equally well to the first temple,

Levites.

from which they must have been in the main transmitted. The whole number of guards to the temple at night is stated to have been twenty-four, of whom three were priests. These are described as having been under an overseer, called “the man of the mountain of the house.”

Thus one division of the Levites was employed as porters during the day, and another as guards during the night: a third division served as musicians. A catalogue of these is given in 1 Chron. xxv. 1-9, according to their employments; and another, according to their courses, in 1 Chron. xxv. 9-31. On grand occasions, when a full band was formed, the family of Heman sung in the middle (1 Chron. vi. 33-38), the family of Asaph on the right hand (vi. 39-43), and the family of Ethan on the left. The ordinary place for the musicians was at the east end of the court of the priests, between the court of Israel and the altar.

It seems that the singers could never be under twelve, because that number was particularly mentioned at their first appointment (1 Chron. xxv. 9); but there was no objection to any larger number. The young sons of the Levites were, on such occasions only, allowed to enter the court of the priests with their fathers, that their small voices might relieve the deep bass of the men (*Gemara. tit. Succah*, ch. v.); and for this authority was supposed to be found in Ezra iii. 9.

At thirty years of age they became qualified for every part of the Levitical service. This was under the tabernacle; but when the temple was built, and bodily strength was less required, the age was reduced to twenty. After fifty they were no longer called upon to serve as a matter of obligation; but they might attend if they thought proper, and perform any usual service which was not considered burdensome. Thus, in the wilderness, they ceased at that age to carry any part of the burdens when the ark and tabernacle were removed. In addition to the more menial duties before described, the Levites doubtless assisted the priests in the important work of the education of the people.

The subsistence of the Levites was provided for in a peculiar manner. It consisted, first, of a compensation for the abandonment of their right to one-twelfth of the land of Canaan; and, secondly, of a remuneration for their services in their official capacity as devoted to the services of the sanctuary. The territorial compensation lay in the 48 cities which were granted to the whole tribe, including the priests. These cities were scattered among the different tribes, as centres of instruction, and had 1000 square cubits, equal to above 305 English acres, attached to each of them, to serve for gardens, vineyards, and pasturage. It is obvious, however, that this alone could not have been an adequate compensation for the loss of one-twelfth of the soil, seeing that the produce of 305 acres could not in any case have sufficed for the wants of the inhabitants of these cities. The further provision, therefore, which was made for them must be regarded as partly in compensation for their sacrifice of territory, and as a remuneration for the dedication of their services to the public. This provision consisted of the tithe, or tenth of the produce of the grounds allotted to the other tribes. The simplest view of this payment is to regard it, first, as the produce of about as much land as the Levites would have been entitled to if placed on the same footing as the other tribes; and also as the produce of so much more land, which the other tribes enjoyed in consequence of its not having been assigned to the tribe of Levi.

When first numbered after the Exodus, the Levites amounted to 22,300, of whom 8580 were fit for service. Just before entering Canaan, they had slightly increased, viz., to 23,000. In David's time there were 38,000 fit for service (1 Chron. xxiii. 3-5), which, at the same ratio as above, would give a total of about 96,000. After the revolt of the ten tribes, they joined themselves to Judah and Benjamin. The restoration of the house of David in Joash

Leviticus was mainly effected by the Levites (2 Chron. xxiii. 1-11). After the edict of Cyrus, only about 350 of them returned to Jerusalem. During the captivity they seem to have lost, in a great measure, a proper sense of their obligations and duties, for many of them married idolatrous wives (Neh. x. 9-13). In the apocryphal books the Levites are not spoken of, and only a few notices of them occur in the New Testament, where they are also called scribes and lawyers.

Godwyn's *Moses and Aaron*; Witsius, *Dissert. II. de Theocrat. Israelitar.*; Jennings' and Brown's *Antiquities*; Carpzov, *Apparat. Crit.*; Saubert, *Comm. de Sacerdot. et Sacris Hebr. personis*; Gramberg, *Krit. Gesch. der Religionsideen des Alten Test.*

LEVITICUS. See **PENTATEUCH.**

LEWES, a parliamentary borough and market-town of England, county of Sussex, on the Ouse, here crossed by a stone bridge, 8 miles N.E. of Brighton, and 50 miles S. of London by railway. It stands on a declivity sloping down to the water side, and is surrounded by hills. The inhabitants are principally employed in rope-making, brewing, tanning, and lime-burning, as well as in the grain, malt, and cattle trade. By the River Ouse, which becomes navigable 2 miles above the town, goods are sent down to Newhaven for shipment to London and other places.

Lewes is one of the oldest towns in England, and numerous remains of Roman art have been excavated in the town and neighbourhood. It was strongly fortified by the Saxons; and after the Norman conquest, when it fell to the lot of William de Warren, son-in-law of William I., a castle, the ruins of which occupy a commanding position above the town, was erected to keep the inhabitants in awe. Earl de Warren also founded a monastery here, now a ruin. In May 1264, the famous battle between Henry III. and the barons under Simon de Montfort was fought in the vicinity, when the latter were victorious. Lewes has returned two members of parliament from the time of Edward I. Pop. (1851) 9533.

LEWIS, the northern portion of the largest and most northern of the islands of the outer Hebrides, lying off the W. coast of Scotland, from which it is separated by the Minch, a sea about 30 miles across. The name Lewis (Celtic, *Leodhus*) is probably derived from Leod or Leodus, son of Thorfin, the last Orcadian viceroy that swayed the Norwegian viceregency of this island. Leodus allocated Lewis to his eldest son Torquil, and Harris to his younger son Norman. These were the first M'Leods, and the ancestors of the Siol Torquil and Siol Tormaid, who so long held these respective properties. Harris, the southern portion of this island, is much the smaller of the two, and is appended to Inverness-shire, whereas Lewis forms part of Ross-shire. The boundary line between the two divisions extends from Loch Resort on the W. to Loch Seaforth on the E., where the island is only about 6 miles in breadth. Lewis is triangular in form, having its base towards Harris, while its apex extends northward, and terminates in the Butt. It is 45 miles in length, by 15 in average, and 30 in extreme breadth; between N. Lat. 58. and 58. 33., and W. Long. 6. 10. and 7. 10. Area, 417,460 acres. The coast is deeply indented by branching arms of the sea, many of which are very capacious, and afford secure anchorage. On various parts of the coast and in these estuaries are numerous small islands which yield excellent pasturage. The chief promontories of Lewis are the Butt, Tiompan, Chicken, Kebuck, and Gallan Heads—all bold and precipitous cliffs rising abruptly from the sea to a great height.

Lewis and Harris are distinct not only in name but also in their general features. The latter consists mainly of an irregular group of comparatively lofty mountains, some of them rising to the height of 3000 feet, rugged and precipitous on their eastern sides, but generally verdant on their

western declivities. That portion of Lewis bordering upon Harris partakes of the same mountainous character, attaining a height of 1400 feet in the Peak of Swaineval, and 900 in the Hill of Roineval. Alluvial straths of fine pasturage, and vales of romantic beauty interrupt and variegates this hilly district, which may be regarded as terminating at a line extending from the head of Loch Roag on the W., to that of Loch Shell on the E. Northward from this line Lewis presents a somewhat monotonous undulating expanse of table-land, interrupted only by a few elevations, the loftiest of which, Monach, does not exceed 810 feet. Throughout the interior, hill and dale are alike clothed by vast accumulations of peat-moss, varying from 2 to 18 feet in depth—studded with numerous lakes, and intersected by silent streams and quiet rivulets. This dark-grounded interior is bordered all along the sea coast by a fringe of arable land, varying in breadth from half a mile to 3 miles, and dotted over with populous villages. The arable soil consists generally of decomposed moss, varying in quality and fertility according as it is intermixed with and based upon siliceous or shelly sand, alluvial till, gravelly loam, or marly clay. The fundamental substratum of Lewis consists of gneiss. On the W. shore it is traversed by veins of granite, and assumes various curves and contortions from granitic disturbance. Near the Butt there are rock masses of orange-red felspar containing laminar scales of argillaceous schist, and beds of green compact felspar. Partial deposits of limestone occur at several places on the N.E. coast. Quantities of bog iron ore protrude in many places, and its prevalence is indicated by the ferruginous impregnation of numerous chalybeate springs. In Harris, Dr Macculloch found those rather rare minerals, *Sahlite*, and dark green *Coccolite*, in serpentine imbedded in limestone.

The climate of Lewis is mild and equable, and its humidity is much under the average of that of Scotland. From its flatness and the absence of high hills, it often escapes the contents of condensed clouds; and the entire surface is exposed to the action of the dry N.E. winds which prevail in spring, and often till midsummer, when the moors are thoroughly exsiccated. The great mildness of the climate, however, is no doubt chiefly due to the influence of the gulf stream. The temperature, even in the interior, rarely continues long at the freezing point, and snowfalls are of very brief duration. Observations taken for nearly four years at Stornoway, in N. Lat. 58. 12., give the mean annual temperature of the—

Year.	Winter.	Spring.	Summer.	Autumn.	Average annual fall of Rain.
46° 5'	40° 8'	40° 5'	51° 1'	51° 6'	30.2 inches.

The extremes of temperature rarely extend over more than 30 degrees from 35° to 65°. The animal kingdom in Lewis is especially rich in the ornithological department. The swan, grey goose, rain-goose, eider-duck, teal, widgeon, heron, snipe, woodcock, red grouse, ptarmigan, are among the most important. Otters and seals abound on the rivers and shores; and deer and hares are common.

The most remarkable ancient remains are the so-called Druidical standing stones, or Temple of Callanish, perhaps the most perfect in Britain. They are 43 in number, arranged in a cruciform manner, with a circle at the intersection. The long leg of the cross extends N. and S. 600 feet, and the transverse line at right angles measures 200 feet. Both measurements include the circle, which is 63 feet in diameter, consisting of 12 stones, ranging from 7 to 9 feet in height, with a central obelisk 15 feet high. The N. extremity of the long leg of the crucifix is formed into an avenue by two parallel lines of 16 obelisks, generally from 5 to 6 feet in height, the loftiest being 13 feet. They all rest on a causewayed base, in which they are firmly impacted by small stones. On a lower eminence, half a mile from the Callanish Temple, there is another cluster of

Lewis.

Lewis.

standing stones disposed into two concentric circles. They are nearly uniform in height, but are deeply imbedded in growing moss. In its vicinity there is another irregular semicircular group of erect stones; and throughout the country there are various specimens, single and in pairs, of those standing obelisks, probably erected as tombstones or cenotaphs, commemorative of the downfall or achievements of noted warriors. Rounded conical tumuli and monumental cairns are abundant. Belonging to a later age are many remains of circular *duns* or round towers, the most perfect of which are those of Bragar and Carloway. The latter was originally upwards of 30 feet high, constructed of unhewn stones, with a double dry wall, containing spiral passages, from which the besieged could aim their arrows at assailants. It is very broad at the base, gradually narrowing and tapering towards the summit. We find also here, particularly on the W. coast and towards the Butt extremity, numerous small chapels and religious cells, generally insignificant in size, but strongly built of stone, cemented by a shelly mortar, which still retains its hardness and tenacity. The most perfect in design and architectural integrity is M'Leod's Chapel at Oreby, dedicated to Saint Molonach, and which was till recently much frequented by incurables for the healing virtues believed to be inherent in its consecrated precincts.

Since Lewis came into the hands of the present proprietor, Sir James Matheson, in 1844, large sums have been expended in carrying out improvements on the estate, as well as ameliorating the physical, social, and intellectual condition of the people. In the short space of seven years, the sums so spent equalled the purchase price of the property, L.190,000. The erection and endowment of educational institutions; the introduction of improved modes of cultivation, and improved breeds of horses, sheep, and cattle; and the institution of cattle and horticultural shows, are among the means that have been adopted. Besides improving and repairing 80 miles of roads formerly constructed, the present proprietor has formed about 100 miles of new roads, with several bridges. The great proportion of the arable land is in the hands of small crofters holding allotments varying in extent from 3 to 8 acres; and to show how much the inhabitants are dependent for food on external supplies, it may be mentioned, that in the seven months from 1st January to 31st July 1855, no less than 18,932 bolls of meal, costing about L.20,825, were imported, and that in consequence of only a partial failure of the potato crop of 1854. The total failure of the potato crop of 1846 entailed an outlay (borne, in the first instance, solely by the proprietor) of L.29,079 for meal alone. To obviate, in some measure, the evils arising from over-population, the proprietor has from time to time furnished free means of transit to other parts to such as were willing to accept of them; and, accordingly, in 1851-52 and 1855, about 1800 souls left the island for various parts of Upper and Lower Canada. An opportunity of free transit is now annually provided.

Great efforts are being made to introduce scientific modes of cultivation; and, with that view, about 2000 acres of previously untitled moorland and meadow pasture have been reclaimed, and a great portion of it converted into large model-farms, held by skilful lowland tacksmen, who exhibit the practical value of the most improved modes of cultivation. At the cattle shows, prizes are annually adjudged to the best specimens of every variety of farm stock and produce.

Lewis is divided into four parishes, each having its own church, school, and manse. Of late years the districts of Cross and Knock have been converted into *quoad sacra* parishes, having 2 churches. There are 8 Free churches, 5 of which have settled pastors, while the other 3 are supplied by probationers; and there are several Free Church schools in each parish,—the whole island numbering 38, showing an annual attendance of 2505 pupils. The few

Roman Catholics on the island receive periodical visits from an ecclesiastic of that persuasion. Here, as in most parts of the Highlands of Scotland, only a small fraction of the people remained with the Established church at the Disruption. More than 19-20ths of the inhabitants of Lewis belong to the Free Church.

The fisheries are the most important branches of industry carried on here. In 1855, 294 boats were engaged in the herring-fishery at the various stations; 35,227 barrels of herrings were cured, and 4000 taken and consumed uncured, the probable value of which was about L.56,840. In that year 903 tons of cod, ling, or hake were cured, and 250 tons taken and consumed uncured, the probable value being about L.17,043. The number of fishermen and boys employed in manning the boats was 2982; persons employed in gathering bait, baiting lines, as carters, &c., 2900. An improved slip for the launching of boats is now in the course of erection, under the direction of the proprietor and Scottish Fishery Commissioners, at the port of Ness, the great centre of the Lewis deep-sea fishing. The quantity and estimated approximate value of the exports from Lewis, in 1855, were as follows:—

Articles.	Quantity.	Value.
Smoked Haddocks.....barrels	800	L.1,600
Herrings.....	40,000	60,000
Cattle.....No.	1,700	6,800
Horses.....	100	400
Sheep and Lambs.....	4,000	3,000
Eggs.....	1,507,400	2,617
Cod and Ling fish.....tons	900	13,500
Salmon.....boxes	400	800
Lobsters.....No.	41,900	1,396
Rags, Bones.....tons	80	800
Wool.....	90	5,400
Whilks.....	22	110
Oil.....	20	800
Hides.....No.	650	450
Old Cordage and Canvas.....tons	30	420
Total,		L.98,093

Stornoway, the only town of Lewis, and the capital of the Western Hebrides, is situate at the head of a bay on the E. side of the island. It is well and regularly built, and its streets are lighted with gas. The most prominent of its buildings are the parish church, Free church, and Episcopal chapel; several of the schools, jail, and the masonic lodge. On an eminence, overlooking the town, is the magnificent mansion of the proprietor, recently erected in the castellated Tudor style. The castle grounds are extensive, and laid out with great taste. The industrial female seminary in Stornoway is a neat and commodious building, erected and endowed by the proprietor and his lady in 1847, at a cost of more than L.2000. It is attended by about 150 girls of the poorer classes, who are instructed in Ayrshire flowering needlework, domestic millinery, and laundry work, as well as the elementary branches of education. The masonic lodge contains elegant assembly rooms, reading rooms, and a public library. Stornoway has a branch office of the National Bank of Scotland, custom-house, a savings bank, Sailors' Home Hospital, and gas and water works. There are also commodious piers, and a building-dock, with a Morton's patent slip, worked by steam, and fitted to haul up ships of 800 tons burden. The entrance to the harbour is marked by a lighthouse and beacon. Near Stornoway there is an extensive tilery, for manufacturing bricks and tiles, erected at considerable expense by the proprietor. He has also introduced the tussac grass pertaining to the Falkland Islands, which appears to thrive remarkably well in the vicinity of the Castle of Stornoway. On 31st December 1855, the number and tonnage of vessels registered as belonging to the port were,—not above 50 tons burden, 38; tonnage, 989; above 50 tons, 12; tonnage, 1245. During that year the number and

Lewis.

Lewis,
Matthew
Gregory
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Lexington.

tonnage of vessels that entered and left the port were,—coastwise, sailing vessels, inwards, 98; tonnage, 4564: outwards, 38; tonnage, 1418: steam-vessels, inwards, 85; tonnage, 16,961: outwards, 87; tonnage, 17,102;—colonial trade, sailing vessels, inwards, 2; tonnage, 63;—foreign trade, sailing vessels, inwards, 13; tonnage, 832: outwards, 42; tonnage, 2119. Pop. of Stornoway (1841), 1354; (1851), 2440. Pop. of Lewis (1755), 6386; (1831), 14,541; (1841), 17,037; (1851), 19,711.

LEWIS, MATTHEW GREGORY, author of *The Monk*, was the son of the Deputy Secretary-at-War, and of a daughter of Sir Thomas Sewell, Master of the Rolls, and was born at London in 1773. While attending Westminster school, he early evinced that taste for theatrical displays, and for books of romance and mystery, which his after years so inveterately confirmed. After studying for a short time at Christ Church, Oxford, he repaired to Germany, with the design of acquiring the language of that country; and there the perusal of the drama, and the wild fictions of the Germans, quickened his own invention, and he produced, in 1795, his most celebrated work, *The Monk*. Full of supernatural horrors, and scenes of blood and demoniacal cruelty, this novel presented a feature of fresh interest to the English public, and became speedily popular; but his coarse and minute handling of the lower passions verged on licentiousness, and nearly brought him under the punishment of the law. The fame thus acquired enabled him to obtain a seat in parliament for Hindon; but his talents were not those of a statesman, and he never ventured to address the House. His play of the *Castle Spectre*, produced on the stage in 1797, rivalled the reputation even of his *Monk*. An interview which he had with Sir Walter Scott at Edinburgh, in 1798, led to the contribution of several noble ballads by the latter to the *Tales of Wonder*, published by Lewis in 1801. On the death of his father, Lewis inherited a large sum of money, and plantations in the West Indies, which he visited in 1815. After securing the affection of his slaves by his kindness, and evoking many public demonstrations of their regard, he returned to England in 1816. But the mismanagement of his affairs recalled him to his estates in the following year; and on his homeward journey he died of fever in the Gulf of Florida, in July 1818.

His novels and numerous plays all exhibit the same extravagant taste for deeds of horror and mystery as his *Monk*; and their popularity, great on their first appearance, speedily declined on the advent of a purer public taste. His poetry, which consists chiefly of songs and ballads, inserted in his prose works, is deficient in passion and imagery; but along with elegance and lucidness of diction, possesses a finished and a musical flow of versification, which drew forth the warm commendation of Sir Walter Scott. The best, however, of all his productions is his *West India Journal*, written during his first voyage, and published in 1833, a work which evinces a talent in describing manners, that might have earned for its author a more during fame than that of his early days. His discretion, good feeling, and unselfish generosity, are shown to great advantage in his *Life and Correspondence*, published in London in 1839.

Next to the *Monk*, his most popular novel is the *Bravo of Venice*, 1804, which has since been reprinted. Of his numerous plays, *The Castle Spectre* alone is still acted. His ballads of *Alonzo the Brave* and *Durandarte* are the most popular of his poems.

LEXICON. See DICTIONARY.

LEXINGTON, a town of the United States of N. America, capital of Fayette county, Kentucky, is situate on Town Fork, a feeder of the Elkhorn, 65 miles E. of Louisville by rail. Its streets are well laid out, and the surrounding country, which is undulating and highly fertile, contains many elegant mansions. The chief public

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edifices are,—Transylvania University, the State Lunatic Asylum, the public library, and churches. Besides these, there is a graceful monument erected to the memory of Henry Clay, who resided for some time at Ashland, a short distance from the town. The legal and medical departments of the Transylvania college have become important institutions. In 1854, the latter had 1351 graduates, forming the third largest number among the colleges of the United States. The manufactures of the town are important, including ropes, bagging, iron machinery, and carriages. In 1850 there were 15 factories engaged in hemp manufacture, employing 600 persons, and making yearly 2,500,000 yards of bagging, and 2,000,000 lb. of rope; while in the neighbourhood there were nearly as many establishments engaged in the same work. Hemp is grown largely in the state. By rail the town is connected with Louisville, Danville, Cincinnati, and other large towns. Lexington, the second oldest town of Kentucky, was founded in 1776, and for sixteen years continued to be the capital of the territory, when, in 1792, the government was transferred to Frankfort, the present state capital. Incorporated 1782. Pop. (1854) about 12,000.

LEYDEN (anc. *Lugdunum Batavorum*), a celebrated city of Holland, province of South Holland, on the Rhine, or rather on that branch of it that retains the name, 10 miles E.N.E. of the Hague, and 23 miles S.W. of Amsterdam, with both of which it is connected by railway. It is surrounded with a rampart, outside of which is a wet ditch crossed by eight bridges leading to as many gates. The River Rhine flows through the heart of the town; and, like other Dutch towns, Leyden is traversed by numerous canals which divide it into about fifty small islands communicating with each other by a great number of bridges. The streets are usually long, broad, and well paved; and the houses are generally of a superior class. The *Breede Straat* is nearly two miles in length, and is reckoned one of the finest streets in Europe. The town-hall is a picturesque old building, founded in 1574, and containing a valuable collection of paintings. St Peter's church, built in 1315, is the largest and finest in the city, and contains among its monuments one to the celebrated physician Boerhaave. The remains of a round tower, called the *Burg*, stand on a slight eminence in the centre of the town, and from the walk round the top the finest view of the city and neighbourhood is obtained. It is said by some to have been built by Drusus, though others ascribe it to Hengist about A.D. 450. Near the *Burg* stands the church of St Pancras, built in 1280, and containing the monument of the brave burgomaster Vanderwerff, who defended the city against the Spaniards in 1574. The University of Leyden, long one of the most distinguished seats of learning in Europe, was founded by the Prince of Orange in 1575, to reward the inhabitants for their bravery in defending the town against the Spaniards. Among its professors were Scaliger, Heinsius, Gomarus, Arminius, Boerhaave; and among its students Grotius, Descartes, Goldsmith, and Fielding. It has faculties of theology, law, medicine, science, and literature; and has usually from 600 to 700 students. It has also a valuable library, botanic garden, observatory, museums, &c. (See article HOLLAND.) There are likewise many fine private libraries and museums, among which may be mentioned the Japanese collection of Dr Siebold. The manufactures are unimportant, but it carries on some trade in grain, butter, and cheese. Historically, Leyden is chiefly noted for the gallant and successful defence made by the inhabitants in 1574 against the Spaniards under Valdez. The siege lasted for about five months, during which the inhabitants endured the greatest suffering from famine and pestilence. Pop. (1855) 37,029.

LEYDEN, JOHN, a celebrated linguist, antiquary, and poet, was born on the 8th of September 1775, at Denholm, a

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village on the banks of the Teviot, in the parish of Cavers, and county of Roxburgh. His father was a shepherd, and was descended from a long line of farmers who had lived on the estate of Cavers. From his second to his sixteenth year, Leyden lived with his parents in a retired cottage near the foot of the "stormy Ruberslaw," where he was taught to read by his father's mother, and where his favourite books were the Metrical Histories of Bruce and Wallace, the Poems of Sir David Lindsay, the *Arabian Nights' Entertainments*, and *Paradise Lost*. He learned writing, arithmetic, and the elements of Latin grammar, during a short attendance of three years at the school of Kirktown; and after studying Latin and Greek for two years under Mr Duncan, a Cameronian minister at Denholm, he entered the University of Edinburgh in November 1790. There, though his knowledge was at first very inaccurate, and the language in which he expressed his ideas so awkward as to set his fellow-students in a roar, he soon became noted for his attainments, not only in the prescribed studies, but in French, Spanish, Italian, German, and the ancient Icelandic. The vacations were generally passed in his native wilds amongst his own relations, with the exception of the summer of 1792, when he acted as assistant, with little success, in a school at Whitebanklee or Clovenfords, a village on the skirts of Ettrick Forest. At this time his appearance was very prepossessing. He was ruddy and fair, with a frame rather delicate than robust, and an expression of great good nature and gentleness in his features.

In November 1793 he began the study of divinity, but at the same time devoted much of his attention to historical research, to philology, to metaphysical speculations, and to natural history and medicine. He was a member of various debating societies, in all of which he distinguished himself by the fluency and copiousness of his unpremeditated harangues, rather than by any graceful or polished eloquence. In one of these institutions, he contracted an intimacy with Henry (now Lord) Brougham, and with Dr Thomas Brown and Francis Horner. About the same time he formed an acquaintance with Dr Robert Anderson, editor of the *British Poets*, and Thomas Campbell.

When he had completed his theological education, he accompanied the two sons of Campbell of Fairfield to St Andrews in 1797, where he attended the lectures of Dr Hunter, professor of humanity, and of Principal Hill, one of the divinity professors. He also entered the Theological Society, and was soon considered the best speaker, among such members as Professor Duncan of St Andrews, Lord Campbell, and Dr Chalmers. From the presbytery of St Andrews he received license to preach in May 1798; and returning to Edinburgh he preached frequently, but without attracting any popular admiration.

In the winter of 1798 he attended some of the medical classes, and at this period inflicted a lasting injury on his health, and nearly lost his life, by his rash and unskilful treatment of a complaint which he believed to be an attack of colic, but which proved to be *enteritis*. In addition to his duties as resident tutor in the family of Mr Campbell, he had been engaged as a writer in the *New London Review*; and, amongst other articles, contributed those on Horne Tooke's *Diversions of Purley*, on Dr Thomas Brown's *Observations on Zoonomia*, and on Vallancey's *Sanscrit History of Ireland*.

In the summer of 1799 he published *A Historical and Philosophical Sketch of the Discoveries and Settlements of the Europeans in Northern and Western Africa, at the close of the Eighteenth Century*. This interesting work, although written in about six weeks, whilst the author was in bad health, and at a distance from books, exhibits proofs of extensive information and sound reflection. An enlarged edition of it was published in 1817 by Mr H. Murray.

Through Mr Richard Heber, to whom he was intro-

duced by Mr Constable, he became acquainted with the most distinguished literary characters in Edinburgh, and, amongst others, with Sir Walter Scott, whom he greatly assisted at this time in editing the *Minstrelsy of the Scottish Border*, by recovering old ballads from oral tradition, and by communicating spirited imitations of the ancient bards, and valuable materials for the notes.

In 1800 a plan formed to establish him as assistant and successor to the minister of his native parish, failed, in consequence of the reluctance of the incumbent to agree to it. Soon afterwards, an attempt which he made to obtain the professorship of rhetoric and belles-lettres in Edinburgh, was also frustrated.

About this time he made two successive tours through the Highlands, and collected much curious information, which was never published. He wrote several poems, founded on the remains of Celtic story, one of which, the beautiful ballad of *The Mermaid*, has been inserted in the *Border Minstrelsy*. In 1801 he contributed to Lewis's *Tales of Wonder*, and published an edition of *The Complaint of Scotland*.

In 1802 he contributed many articles to the *Scots Magazine*, of which he had been newly appointed editor. He was also employed in collecting the papers of the Highland Society for publication; and he edited a volume entitled, *Scottish Descriptive Poems, with some Illustrations of Scottish Literary Antiquities*. Early in this year he offered to the African Society to explore the interior of that continent, in which so many Europeans have perished. His friends, alarmed at this, became eager to obtain for him an Indian appointment; and, through the interest of Mr William Dundas, he was nominated assistant-surgeon in the Company's service, on condition that he should take a surgical degree. After intense study for six months, he received the necessary diploma. The degree of Doctor of Physic was conferred upon him by the University of St Andrews, on the 7th August 1802. Meanwhile, he had finished his longest poem, *Scenes of Infancy*.

Leyden, after spending the winter in London, sailed from Portsmouth on the 7th of April 1803, and soon after his arrival at Madras, was attached as surgeon and naturalist to the commission for surveying the districts of the Mysore. In this latter capacity he was expected to turn his attention, not only to the natural history of the country, but to the manners, institutions, and language of the inhabitants. His labours hurting his constitution, obliged him to remove to Prince of Wales Island. Here he was befriended by the governor, Mr Dundas, and here, too, he procured the chief materials of the *Essay on the Languages and Literature of the Indo-Chinese Nations*, contained in the 10th volume of the *Asiatic Researches*.

He removed in 1806 from Prince of Wales Island to Calcutta, where, through the favour of the governor-general, Lord Minto, he was appointed one of the professors in the Bengal College, but was soon transferred to the office of Judge of the Twenty-four Pergunnahs of Calcutta. In 1809 he was appointed a Commissioner of the Court of Requests in Calcutta; and, in the end of the following year, having resigned this office, he obtained the office of Assay Master of the Mint. Soon afterwards, he accompanied Lord Minto upon the expedition to Java, for the purpose of collecting information touching the learning and institutions of the native tribes, and assisting the governor-general in negotiating with the local authorities, and in adjusting the future government of the country. After the British troops took possession of the city of Batavia, he caught fever from having ventured rashly into an ill-aired library, supposed to contain many Indian manuscripts, and died on the 21st of August 1811, after an illness of three days.

Shortly after Leyden's death, Lord Minto and Sir John Malcolm both publicly expressed their high estimation of

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his extensive erudition, his unwearied pursuit after knowledge, and his exemption from all sordid vices. A few personal foibles, such as his egotism and awkward deportment, did not render him less endearing to his friends. His *Poetical Remains* were published in 1819, with a memoir by the Rev. James Morton; and in 1826 appeared his posthumous work, entitled, *Memoirs of the Emperor Baber*. An *Essay on the Life of Leyden* is contained in *Scott's Miscellaneous Works*.

LEYTE, an island of Australasia, one of the S. Philippines, between Bohol and Samar, 180 miles in length from N. to S., by 40 miles in breadth. Its surface is mountainous, and subject to volcanic action; but the soil is rich, and the climate fine for so low a latitude. The products comprise, of minerals,—sulphur, iron, and asbest; and of vegetables,—bananas, tobacco, sugar, palm-oil, and fine woods. There are also large quantities of horns, tortoise-shell, hides, and wax, exported to Europe and the United States. Pop. about 100,000, of whom nearly 70,000 are under Spanish control. See also PHILIPPINES.

LHUYD, EDWARD, a celebrated antiquary, was the son of Charles Lhuyd, Esq. of Lhanvorde, Shropshire, the descendant of an ancient Welsh family, and was born in Wales about 1670. Having entered Jesus College, Oxford, in 1687, he applied himself to the study of natural history, and particularly of fossils, under Dr Plot, whom he succeeded, in 1690, as keeper of the Ashmolean Museum. He took his degree of Master of Arts in 1701. Bent upon discovering the antiquities of the primitive Britons, he made several journeys through Wales, Cornwall, Scotland, Ireland, and Basse-Bretagne, perusing old manuscripts, transcribing the ancient charters of monasteries, and, in addition to the particular information he desired, collecting many curious notes on natural history, and other subjects, which were afterwards inserted in the *Philosophical Transactions*. Many of his researches concerning Wales were inserted by Bishop Gibson, in his edition of Camden's *Britannia*. The great mass, however, of his discoveries was published at Oxford in 1707, under the title of *Archæologia Britannica*, an account of the language, histories, and customs of the original inhabitants of Great Britain, which contains an *Irish-English Dictionary*, the outline of a larger one which he left in manuscript. His work *Lithophylacii Britannici Ichnographia*, was published at London in 1699, and reprinted by Mr Huddesford in 1760. Lhuyd died in 1709.

LIBANIUS, a celebrated sophist and rhetorician, was born at Antioch in Syria, in A.D. 314. After receiving his elementary education in his native city, he repaired to Athens, and while under the public tuition of several eminent masters, cultivated in private a taste for the classical writers of Greece. Leaving Athens, after a stay of four years, he travelled about for a short time, and finally settled in Constantinople, where his fame as a teacher of rhetoric attracting great numbers of students, drew upon him the envy and malice of the public professors. Through their influence with the Prefect Limenius, he was expelled from the city, and removed to Nicomedeia about A.D. 346. Here his great success in teaching, coupled, no doubt, with the native vanity of his character, was once more the cause of great hatred in his rivals. Driven by a plague from Nicomedeia, he returned to Constantinople, and lived there harassed by the enmities of his fellow sophists, yet refusing to leave it upon the offer of the chair of Rhetoric at Athens, until his declining health forced him to retire to his native Antioch. In his latter days, he was honoured with the notice of the Emperors Julian, Valens, and Theodosius. Chrysostom, and probably St Basil, were his pupils in eloquence; and towards these, as well as other Christians, his own paganism did not prevent him exercising tolerance. He died at some period after A.D. 391. A suc-

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cessful imitator of Demosthenes and the ancient orators, he excelled all the rhetoricians of the fourth century; but his excellence in refining his diction is often attained by the loss of strength and precision of thought.

Of the extant works of Libanius there is no complete edition. The best edition of his *Προγυμνασμάτων παραδείγματα* (Examples for Rhetorical Exercises), his *Λόγοι* (Orations), and his *Μελέται* (Declamations), was published by J. J. Reiske, Leipsic, 1791–97. The best edition of his *Ἐπιστολαί* (Epistles) is by J. C. Wolf, Amsterdam, 1738. Prefixed to Reiske's edition is an autobiography of Libanius.

LIBANUS, or LEBANON. See SYRIA.

LIBAU, a Baltic seaport-town of Russia, government of Courland, at the mouth of a cognominal stream, 54 miles N. of Memel; N. Lat. 56.30., E. Long. 20.58. It is surrounded with walls, but its streets are irregular and ill paved. The houses have generally but one storey, and are constructed of wood. The chief public buildings are,—an hospital, an orphan asylum, and three Protestant and one Catholic church. The trade of the port is considerable, embracing the products of Courland, such as flax, hemp, grain, leather, and timber, which are exported to Western Europe in large quantities; and including as imports, coal, salt, sugar, machinery, herrings, and wine, sent hither chiefly from Britain and America. The harbour of Libau is formed by a lagoon, with only 12 feet of water at the bar, which obliges large vessels to anchor in the roadstead about two miles from the town, and receive their cargoes by means of lighters. The total value of imports into this town amounted in 1851 to L.25,563, and in 1852 to L.21,800; while the total value of exports in 1851 amounted to L.165,750, and in 1852 to L.142,034. Of the latter, goods to the value of L.8291 were shipped coastwise in sixty-three vessels. Pop. (1852) 8961.

LIBEL, a word which has many different meanings, but is chiefly known in this country as the name of a department of the law, which, from incidental circumstances, has come to include the naturally distinct heads, of written slander, sedition, and outrage against religion. Towards all its separate and sometimes trivial meanings, the word may be traced through history and usage from its original meaning of a little book (*libellus*) consisting of a set of leaves stitched together, and thus distinguished from a roll, or *liber*, as we distinguish a pamphlet from a volume at the present day. Certain accusatory pleadings in the courts of justice were, in Roman practice, presented in stitched leaves, which were called *libelli accusatorii*; and it is from this original use as a document, containing an accusation, that the word libel has wandered into all its wide and varied significations. After it had acquired its well known signification as a transgression of the law, it continued to retain its original technical meaning as a part of the form of process in the various systems of law derived from Rome. In the practice of the Vatican, Du Cange finds *libellus anathematis* as the equivalent to a bull of excommunication. In English ecclesiastical practice the complainant's grounds of complaint, or accusation, are set forth in a libel systematically divided into three parts. 1. The major proposition, which shows a just cause of the petition; 2. The narration or minor proposition; 3. The conclusion, or conclusive petition, which conjoins both propositions. The accusation or indictment by which in Scotland a person is accused of a crime before a court of criminal justice, is in the same syllogistic form—derived from the practice of the scholastic divines, and is called a *Libel*. The term is of frequent use in a like sense in the Presbyterian ecclesiastical courts of Scotland. It is there employed as a verb as well as a substantive; and when one is "libelled" in a presbytery, it is not meant that some rash or malicious charge has been levelled against him, but that he has been subjected to a formal accusation.

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It is this use of the word *libellus* to mean especially a document of accusation, that has made it the root of the whole law of libel. It acquired its modern meaning of a rash or malicious accusation early in the history of the Roman law, where we find the authors of *libelli famosi* visited by heavy punishments, sometimes with death. But we have few lights on the nature of the libel law of Rome, probably from the rare occurrence and limited importance of an offence which required the art of printing to give it a great social influence. The 36th title of the ninth book of the Justinian *Code* is devoted to *libelli famosi*, and refers to them rather as writings hidden in private places, for the purpose of creating an under-current of suspicion difficult to be refuted, than as accusations deriving their mischief from their publicity. The person who finds such a libel—called a *chartula*—and does not burn or destroy it, but, on the other hand, mentions its contents to some one, becomes as guilty as if he had been the author of the libel. In the tenth title of the 47th book of the Pandects, *De Injuriis et Famosis Libellis*, there are remedies for a variety of petty injuries. Among these, unjust attacks on reputation are mixed up, in a manner that would seem at the present day very incongruous, with such offences as trespasses, the unjustifiable castigation of slaves belonging to other people, assaults by slaves on each other, the interruption of public rights, sharp or oppressive practice against poor debtors, sending smoke or filth into a neighbour's house, and the like,—an incongruous and unconnected gathering of incidental matters which appear not to have found any place in the great divisions of the law. Among these injuries for which there is prætorian redress, is included the bringing disgrace or ridicule on a citizen by contumelious action, or the handing to a ruler or other influential person a *libellus* containing an attack on a citizen's good fame.

These scattered morsels of law served as precedents in the countries which adopted the Roman system. The suppression of *libelles defamatoires* is a frequent object of the old French ordonnances. The laws on the subject increased in number and precision in the sixteenth century, when the rapid progress of the art of printing made work for them. Indeed, it is generally observed by the French jurists, that until this period the maxims of the Roman law on defamatory libels had lain dormant. But from the days of Calvin downwards France has been the theatre of a relentless struggle, in which a press, restless and audacious—too often at the same time profligate—has fought with a succession of repressive laws, varying according to the various powers which have from time to time held absolute rule in that country. The French jurists notice, from an early period, how the laws for the suppression of libels cannot fail to be an irksome restraint on the genius of those authors whose strength lies in sarcasm, and greatly to curtail the enjoyment of those whose chief solace it is to read witty and epigrammatic remarks on the vices or follies of their fellow men. All who are accustomed to the perusal of that vast series of works of genius coming under the general term of *memoires*, must be conscious how little would remain behind, if, even in the periods of the strongest and most suppressive governments, all that is with us called libellous matter were suppressed. The vehemence with which those who were themselves not inclined to speak gently of their opponents or rivals, sought the aid of the arbitrary laws against libel, is very instructive. Voltaire was noted for his attempts to obtain legal redress for sarcasms on himself which were but a faint imitation of those which he had launched against others. How entirely the machinery for the punishment of libels was in the hands of those who had great personal influence, is shown by a curious anecdote narrated by Marmontel in his life of himself. He was charged with libelling, in the *Mercur*, an influential courtier, who prevailed on Choiseul, the prime minister, to commit

him to the Bastille. Marmontel says he proved his innocence to the complete satisfaction of Choiseul, who regretted what had occurred, but said he must keep his word to his distinguished friend, to whom he had pledged his faith that Marmontel should go to the Bastille; and Marmontel submitted to his fate as a necessity, expressing his gratitude for the comfortable accommodation and the luxurious table by which his prison life was alleviated.

The course of events through which the law of libel which we have seen to be a creature of the Roman jurisprudence, found its way into the common law of England, where every gift from that quarter was eyed with suspicion, forms a curious little episode in constitutional history. Offences against religion were tried in the ecclesiastical courts, which took their form of procedure from the civil law. As they became unnerved after the Reformation, the notorious Star Chamber took up their functions, adding to them a jurisdiction in minor political offences. The Star Chamber thus became the tribunal where both branches of the public law of libel were adjudged upon the Roman system. As its power waxed strong in the reign of Charles I., its political functions in administering the law of libel became more conspicuous, attracting at length a degree of public indignation before which this growing fabric of arbitrary judicial power finally fell. It was here that Prynne was condemned to the loss of his ears, and the pillory, for a collocation in the index of an unreadable volume, which seemed to point with scorn to the gaities of the queen; and that he was a second time condemned, after his ears were more closely shaven, to be pilloried with Burton and Bastwick.

On the fall of the Star Chamber this branch of jurisdiction, along with its foreign name, was, with much adroitness, appropriated by the courts of common law. To give a remedy in a court of law to a person who was slandered and maligned, and even to one who was needlessly held up to contempt or scorn, was a simple and natural process. From this point a step onward was taken by the public prosecution of those who maligned or insulted their neighbours, on the ground that the sense of injury sustained by those who suffered from their accusations, was likely to lead to excitement and turbulence. The circle of offences thus created widened indefinitely. Censorious remarks on the people who governed the country, or on the system of government itself, or the national religion, were to be punished, not as in themselves wrong, but as acts which, by the provocation which they were calculated to excite, led to a breach of the peace. The process of reasoning by which the law for the protection of private character was made a means of punishing state offences, cannot be better explained than in the words of Sir Edward Coke:—"Every label (which is called *famosus libellus*, or *infamatoria scriptura*) is made either against a private man, or against a magistrate or public person. If it be against a private man, it deserves a severe punishment; for although the libel be made against one, yet it incites all those of the same family, kindred, or society to revenge, and so tends *per consequence* to quarrels and breach of the peace, and may be the cause of shedding of blood, and of great inconvenience. If it be against a magistrate or other public person it is a greater offence, for it concerns not only the breach of the peace, but also the scandal of government; for what greater scandal of government can there be than to have corrupt or wicked magistrates to be appointed and constituted by the king to govern his subjects under him? and greater imputation to the state cannot be, than to suffer such corrupt men to sit in the sacred seat of justice, or to have any meddling in, or concerning, the administration of justice.

"Although the private man or magistrate be dead at the time of the making of the libel, yet it is punishable; for, in the one case, it stirs up others of the same family, blood,

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Libel. or society to revenge, and to break the peace; and, in the other, the libeller traduces and slanders the state and government which dies not." (The case *De Libellis Famosis*, Rep. iii. 254.)

When these doctrines were promulgated, the growing fiction of law had not so far ripened as to be applicable to pure enunciations of opinion on politics or religion. Strong expressions of political opinions, offensive to the government, were generally punished under the laws of high treason, as in the instance of Algernon Sidney, against whom the doctrines expressed in a manuscript paper found in his repositories, was the most effective evidence; and expressions deemed offensive to religion, if they were not reached by the statutes passed for the special protection of the Church of England, might be counted blasphemy, and so punished at common law. (See *BLASPHEMY*.) In the earlier cases in which the comparatively new law of libel was applied to public offences, it always rested on the statement at least of some private person having suffered an injury; and in the case of Sir Charles Smedley, prosecuted for one of the brutal acts of public profligacy for which the courtiers of Charles II.'s reign were notorious, some commentators have been at pains to show that there was an actual assault caused by his indecent exhibition, and that it was for having given occasion to that assault—not for the vague offence of outraging public decorum—that he was punished.

It was not until the case of Curl in 1728, that the fiction of the attack being made on some person, and therefore dangerous to the state, as an incentive to a breach of the peace, appears to have been dropped as tending to hamper the law. The prosecution in that case was for the publication of an indecent book, *quendam turpem iniquum et obscenum libellum*, tending to corrupt the subjects of the realm. It was not the act in itself as immoral, but its tendency "to disturb the civil order of society," that was the ultimate reason for awarding punishment, which in this instance was the pillory. But there was still a difference of opinion on the bench on the competency of the common law to reach such cases, and Justice Fortescue said,—“I own this is a great offence, but I know of no law by which we can punish it. Common law is common usage, and where there is no law there can be no transgression. At common law, drunkenness and cursing or swearing were not punishable, and yet I do not find the spiritual court took notice of them. This is but a general solicitation of chastity, and not indictable.” (Strange's *Reports*, ii., 789.)

In this manner the law of libel came to comprehend a vast range of legal remedies, from the punishment inflicted on the public offender whose acts bordered on high treason, to the damages incurred for mere personal slander. The different degrees of the offence were in some measure classified by the form of procedure. A public libel might be prosecuted on indictment presented by a grand jury, or on official information by the Attorney-General. In other cases where the private wrong was maintained to be of a public and flagitious character, the nominal concurrence of the crown with the private prosecutor was obtained in the shape of an information by the master in the crown office in the Court of King's Bench. The two classes of actions,—the one really or nominally for a public offence, the other a mere action of damages for private injury,—came to be distinguished from each other in the important feature, whether the truth of the statement was or was not a vindication. It was held that in private actions the truth of the charges made in the published document complained of, might be proved for the purpose of showing that the prosecutor had suffered no harm, and was entitled to no damages. But in proceedings by indictment or information, evidence of the truth could not be received, because it could not affect the question professedly at issue, whether the publication was

calculated to create a breach of the peace? And, indeed, it was a common exercise of jurisprudential ingenuity to maintain the paradox,—that the truth of the statements could be nothing but an aggravation of the libel, since the person who could not defend his character by the general good opinion of his fellow-citizens, or by a civil action, was all the more likely to punish his assailant by violence. The effect of such doctrines was, however, so far restrained in practice, that the Court of King's Bench would not, in the general case, grant an information for a libel to a person using that form of procedure in a prosecution virtually private, unless he made affidavit that he was innocent of the charge imputed to him.

A noted peculiarity of the English law of libel is its vagueness and uncertainty. Except from the very flagrancy of the matter, no one can tell whether certain expressions are or are not libellous, whether in a political or a private sense. It has thus been an arena in which the party for the time in power has used its strength in conflict with the party in opposition, and in which, sometimes, a popular opposition has found means of striking a blow against adherents of the government. This dubiety is in itself certainly an evil; but the great range which the law of libel takes in this country, is owing to one of the most valuable safeguards of the liberty of the press—the absence of a censorship. In countries where this restraint exists, the institution corresponding to our law of libel may occupy very narrow limits. If a work be published without the authority of the royal licenser, the presumption is against it; if it have received an *imprimatur*, its innocence is already pronounced. It was the total absence of even a modified restraint of this character that made De Lolme search among the English law books for those laws which secured the liberty of the press, and feel puzzled by the discovery that the whole department was a blank. The censorship existed of old in this country as well as others, and its disappearance is materially connected with the history of the law of libel; hence the evils of this law have, in a great measure, been the compensation paid by the public for a relief from the greater evils of the licensing system.

When the power of the printing press became first manifest as a political engine, the various governments and powers throughout Europe seemed to think that it was as much their own, and as little to be freely used by individual citizens, as the military force. The freedom to print such works as the established government might not object to, was deemed rather a concession than a restraint. In the eighteenth century, even the authors of the *Dictionnaire de Travaux*, speak of it as an important element of superiority, that the Christian states license the printing of books, while in the Mohammedan they are not licensed but prohibited. The licensing power as a prerogative in the monarch was broken up in various ways in the European states. The ecclesiastical order claimed its own share for the papal hierarchy. Licensing powers were deputed to universities and other corporations; and in countries like France, and the larger German states, works on science, or otherwise disconnected with politics or divinity, thus obtained a virtual exemption from minute examination. Censorship of the press exists to a greater or less degree in nearly all the European states. Its history in the British Empire is instructive. That printing ought to be exercised under the control and by the direction of the government, seems no more to have been doubted in England in the sixteenth century than in Spain or Austria. By the Reformation, the command of the press was more strongly concentrated in the crown of England than in that of any other kingdom, because it ceased to be divided,—the portion which belonged to the popedom, vesting, as part of his ecclesiastical supremacy, in Henry VIII. The Bible and other religious books were printed under letters patent. The use of print-

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ing presses was limited to the Company of Stationers, who were the servants of the government, subjected to strict regulation in the Star Chamber. "These regulations," says Hallam, "not only limited the number of presses and of men who should be employed on them, but subjected new publications to the previous inspection of a licenser" (*Const. Hist.* ch. xiii.). Even the *Histrionastix*, for which Prynne suffered, had been licensed; and it seemed to aggravate the wrath of the authorities, that, by his pertinacity in ever increasing the bulk of the unreadable mass as he sent it up to be licensed, Laud's chaplain, whose duty it was to examine it, permitted it, in despair, to pass without perusal. During the civil war there was a luxuriant profusion of controversial pamphlets; for either side launched the artillery of its press, as it employed its other forces, against its adversary. The Long Parliament did not scruple, by stern ordinances, to suppress dissent from its authority in the press within its reach. Immediately after the Restoration, the censorship of the press was established by a memorable statute. The act "for preventing abuses in printing seditious, treasonable, and unlicensed books and pamphlets, and for regulating of printing and of printing presses," commences with the preamble, "Whereas the well government and regulating of printers and printing presses, is matter of public care and of great concernment, especially considering that by the general licentiousness of late times, many evil disposed persons have been encouraged to print and sell heretical, schismatical, blasphemous, seditious, and treasonable books, pamphlets, and papers, and still do continue such their unlawful and exorbitant practice, to the high dishonour of Almighty God, the endangering the peace of these kingdoms, and raising a disaffection to his most excellent majesty and his government; for prevention whereof no surer means can be advised than by reducing and limiting the number of printing presses, and by ordering and settling the said art or mystery of printing by act of parliament." The act, though long and intricate, gives its essence in the short clause which provides that no private person shall print a book or pamphlet unless it be entered in the Register of the Stationers' Company; and "unless the same book and pamphlet, and also, all and every the titles, epistles, prefaces, proems, preambles, introductions, tables, dedications, and other matters and things thereunto annexed, or therewith to be imprinted, shall be first lawfully licensed and authorized to be printed by such person and persons only as shall be constituted and appointed to license the same." This is followed by a classification of literature according to the licensers. At the head come "books concerning the common laws of this realm," which are placed under the Lord Chancellor, or the other heads of the law in the order of their rank. Books of history, the affairs of the realm, or matters of state generally, are to be licensed under the authority of the Secretary of State. The next class in the order of importance contains books of heraldry, which are to be licensed by the Earl Marshall or the Kings-at-Arms. Last in order are "all other books to be imprinted or reprinted, whether of divinity, physic, philosophy, or whatsoever other science or art," to be licensed by the Primate or the Bishop of London, or by one of the universities if the printing were to be at the university press. The chief licenser appointed under the act was Roger L'Estrange, himself a celebrated pamphleteer and libeller. At the revolution he was, of course, superseded by a supporter of the new settlement. For the protection of that settlement, however, the House of Commons, ever on the watch for the promulgators of counter-revolutionary opinions, whom it punished for breach of privilege, was a better champion than any licenser; and at length the zeal and rivalry of the House in the performance of this function drove the licenser out of the field. In the year 1693 the office was held by Edmund Bohun. He was a Tory and High

Churchman, but had argued himself, or professed to have argued himself, into a thorough support of the new dynasty, on the very peculiar ground that King William and Queen Mary were entitled to the throne by right of conquest. Charles Blount, an unscrupulous author, who hated him, laid a trap to ensnare him by means of his eccentric politics, and laid before him as licenser, a work called *William and Mary Conquerors*. It was cleverly adjusted so as not to be too flagrant for the licenser's sympathies, and yet to be flagrant enough to excite the revolution party to fury. The wrath of the House of Commons fell on Blount, and on his office. The licensing act was a temporary measure, renewable from time to time, and when the bill came up for renewal, two years afterwards, the Commons, by a special vote, struck it out of the list of the temporary acts to be continued. In a conference with the Lords, who desired to renew the act, they gave in a paper containing the reasons for their vote. "This paper," says Mr Macaulay, "completely vindicates the resolution to which the Commons had come. But it proves, at the same time, that they knew not what they were doing—what a revolution they were making—what a power they were calling into existence. They pointed out concisely, clearly, forcibly, and sometimes with a grave irony which is not unbecoming, the absurdities and iniquities of the statute which was about to expire. But all their objections will be found to relate to matters of detail. On the great question of principle—in the question whether the liberty of unlicensed printing be, on the whole, a blessing or a curse to society—not a word is said." The only vestiges now remaining of restraints on the press are the obligation on every printer to put his name on his book, an arrangement advocated by Milton in his plea for a free press; and the obligation on the proprietors of newspapers to register themselves, and to give bond for the payment of any penalties to which they may become amenable.

At several periods, and especially during the anti-revolutionary fervour created by events in France, the liberty of the press was threatened, and temporarily affected. The general principle, however, outlived all these dangers, and it was felt that in the present reign the law of libel might be safely stripped of some of its asperities. The law was regulated in 1843, by an act professing to be passed "for the better protection of private character, and for more effectually securing the liberty of the press" (6th & 7th Vict., c. 96). It gives weight to any apology or reparation which the utterer of a libel may have offered, and particularly, when it has appeared in a newspaper, to an apology published in the same manner. Libel had been excepted from those actions in which the defendant might pay into court the damages tendered by him; but by this act, when the absence of malice, and the publication of an apology are pleaded, the defendant may tender damages. On an indictment or information, the defendant is authorized to enter a general plea of not guilty; and it will be justified if he prove the truth of his statements, and that it was for the public benefit that they should have been published. This neutralizes the old principle, which refused to admit evidence of the truth when the trial was on indictment or information. As a partial protection to the editors of newspapers, the defendant might prove that the publication was made without his consent or knowledge. The act does not extend to Scotland; it was extended to Ireland in 1845.

In Scotland, the word libel, though used, as we have seen, to express a formal accusation, in the practice of the courts of law, was not indigenous in the sense in which it has been chiefly used in England. The law equivalent to that of political libel was, until lately, in a very unsatisfactory condition. Of old, it was called leasing-making, as the crime of falsely representing the conduct of governors towards the people. After the Union, this vernacular term dropped

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Liberia. out of use, and the nomenclature of the civil law supplied the word sedition in its stead. In the years 1793 and 1794, the vague character of the law enabled the government to carry out, in Scotland, severities which the strict barriers protecting the freedom of the subject at once checked in England. The punishments at that time inflicted on men, some of whom were merely pursuing such a course of free criticism on the practical condition of the constitution as all parties have in later times practised and encouraged, has received a general condemnation, which renders it unnecessary to recal the particulars of the several cases. Their most offensive feature was this, that sentences of transportation to the penal colony of New South Wales were passed, avowedly in the administration of old laws, adopted when Scotland had no colonies, and when transportation was impossible, although they doubtless sanctioned banishment, or the driving of the culprit out of the country. This vague character of the law, which, in a time of terror and excitement, had shown itself so liable to abuse, was corrected by statutes which imposed fine and imprisonment as the punishments of sedition.

Fortunately, of late years, the law of political libel has dwindled almost out of existence, as a disease in the vital frame disappears before progressive health and vitality. The reverberations of the great continental revolutions of 1848 did not pass over Britain without commotion; but the safety of the country was sufficiently secured by suppressing acts of violence without too curious an inquiry into the tendency of opinions. As to the law of private libel, both in England, where it grew, and in Scotland, to which jury trial virtually transplanted it, the width and vagueness of its character are the objects of continued complaint. Perhaps a means may be some day found of correcting this defect; but in the meantime, it must be viewed as the price paid for the liberty of the press and for freedom of discussion generally. It is quite true, that no lawyer can give a definition of libel as he can of theft or forgery; that, according to the general descriptions of a libel supplied by the law-books and the cases, there are many people every day unconsciously committing the offence; and that there are multitudes of whom it may be said, that they owe it not to their keeping within the law, but to the forbearance of their fellow-citizens, and that freedom from vindictiveness so honourable to the British character, that they are not attacked with prosecutions. But the answer to all this is, that the reliance is well bestowed. Every man is in the hands of the public, and in the long run they see fair dealing.

(J. H. B.)

LIBERIA, a free negro republic on the W. coast of Africa, extending in a S.E. direction from Sierra Leone, along the coast for about 500 miles, and having an average breadth of about 40 miles; between N. Lat. 4. 20. and 7. 20., W. Long. 6. 50. and 12. 40. Area about 20,000 square miles.

The republic of Liberia owes its existence mainly to the efforts of a few benevolent citizens of Washington, who, in 1816, formed themselves into a society called the "American Colonization Society," for the purpose of rescuing the free people of colour from the degradation and misery to which they were condemned in America. In 1817 a deputation of the society visited England, and was received with much cordiality by Wilberforce, and other friends of the anti-slavery movement; and with their advice the agent of the society was sent out to the W. coast of Africa for the purpose of making a careful survey of the country, and reporting as to its suitability for a negro colony. The site first chosen was the small island of Sherboro, situated near the coast, about 120 miles S. of Sierra Leone, and the first colonists arrived there in the early part of 1820. The situation, a low, densely-wooded island, proved unhealthy in the extreme, so that in the course of a few months most of the agents who attended the expedition, and many of

the negroes, fell victims. A less deadly climate had, therefore, to be sought for, and an agent was again sent out by the society for that purpose. Cape Mesurado, on the mainland, about 300 miles S.E. of Sierra Leone, and rising about 150 feet above the general level of the shore, seemed to promise a suitable locality for the settlement. With difficulty the native chiefs were induced to dispose of a tract of land here; and on the 25th of April, 1822, the American flag was planted on Cape Mesurado; the settlers of Sherboro, who had been removed for a time to Sierra Leone, having been transferred to their new settlement. Their numbers were speedily augmented by fresh arrivals, but the colony was long in a very precarious and unsatisfactory condition. The settlers lived in continual fear of the fierce and treacherous tribes by whom they were surrounded, who not unfrequently attacked them at a disadvantage and inflicted considerable loss. They were also on several occasions reduced to the greatest distress by scarcity of provisions, and a failure of ammunition; and the climate, though less fatal than formerly, still proved very injurious. By degrees, however, these difficulties were overcome, and as their numbers increased they became better able to maintain their ground against the encroachments of the neighbouring tribes. The weaker tribes now became desirous of being received under their protection, and they were in every case received on condition of their becoming Liberian citizens. Partly by this mode of annexation, and partly by the occasional purchase of small portions of territory, the boundaries of the settlement were gradually extended. New settlements were made, new towns built, trade increased, and agriculture flourished. In 1839 a constitution was framed, and a governor appointed by the Colonization Society; and in 1847 the independence of the colony was formally declared, and a republican constitution adopted. The British and French governments promptly recognized the new government, and framed liberal treaties with it. The constitution is professedly a copy of that of the United States. The executive power is vested in a president, who must be at least thirty-five years of age, have resided five years in the country, and be in possession of an income of 500 dollars. He is elected for two years, but may be indefinitely re-elected. The senate and house of representatives exercise the legislative power. The senate consists of six members, at least twenty-five years of age, having resided in the colony for three years, and possessed of an income of 200 dollars. They are chosen for four years. The representatives are chosen for two years, and are required to be twenty-three years of age, to have resided for two years in the colony, and to be possessed of an income of fifty dollars. The number of representatives is 28. The judicial power is lodged in a supreme court, and several inferior tribunals. The rights of citizenship belong exclusively to people of colour. The climate of Liberia, although more healthy than that of Sierra Leone, is still uncongenial to the white man, though to the blacks it has the character of being very genial. The effect of clearing, draining, &c., upon the climate during the last ten years, is said to be very remarkable. The duration of life among the colonists is considered to be about the same as in the United States. The country is characterized as being very fertile, the hills and plains being covered with a never-fading verdure. Cotton, coffee, indigo, and the sugar cane, are all spontaneous productions of the forests. Rice, Indian corn, Guinea corn, and numerous species of fruits, may be grown to any extent. Cattle, swine, fowl, ducks, goats, and sheep, require no care save only to keep them from straying. Palm oil, camwood, ivory, gold-dust, coffee, indigo, ginger, arrowroot, and hides, are the principal exports. Palm oil is the great staple of Liberia at present; and the demand for it in England, France, and

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the United States is rapidly increasing. Coffee, sugar, and cotton would, with a due application of capital and labour, become of the greatest value to the state. A considerable coasting trade is carried on, as well as a large trade with the interior. The exports to foreign countries are said to average upwards of L.100,000 annually. Pop. estimated at about 200,000, of whom about 10,000 are free blacks from the United States. Schools and places of worship have been established over the country. Liberia is divided into the counties of Mesurado, Bassa, and Sinde. The chief town is Monrovia, containing about 2000 inhabitants.

The "Maryland Colony," on Cape Palmas, in the S.E. of Liberia, was founded in 1834, by the "State Colonization Society," and consists of free coloured emigrants sent thither from the state of Maryland. Till very recently this colony remained dependent on the parent society, but, according to the latest accounts we have received, it too had declared its independence, though it seems very doubtful if so small a republic can exist in that part of the world; and it would unquestionably be for the advantage of both it and Liberia that they were conjoined.

LIBERIUS, Bishop of Rome, succeeded Julius I. in 352, during the dominancy of the semi-Arians. Soon

after his accession, it is said, he excommunicated Athanasius, the great antagonist of Arianism; but when the councils of Arles and Milan, overawed by the Emperor Constantius, deposed that bishop in 355, Liberius, changing his policy, could not be induced, either by compulsion or blandishments, to sign the deposition. Hurried in secrecy from Rome during the night, and carried before the Emperor in Milan, he still remained faithful to Athanasius, and was banished to Bercea, in Macedonia. After an exile of two years, however, he withdrew his protest, and signed the semi-Arian creed of Sirmium. The Emperor, overcome by the pertinacious petitions of the ladies at Rome, then permitted him to share the management of his see with Felix, who had succeeded during his banishment. The latter was forced to flee from popular violence, and Liberius, left in the peaceful possession of his dignity, expiated, it is said, his defection from orthodoxy, by a sincere recantation. He died in 366.

Liberius is the reputed author of twelve epistles, published in Coustant's *Epistolæ Pontificum Romanorum*, Paris, 1721; and he is said to have built the Basilica, on the Esquiline Mount, which from him has sometimes been called Liberiana, but is now known as the Santa Maria Maggiore.

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I.—NATURE AND OBJECTS OF THE INQUIRY.

THE task of pointing out which of the acts, capable of being committed by the press, it would be expedient to prohibit under penalties, we trust will be found to be greatly diminished, by what has been already established in the articles GOVERNMENT and LAW.

There is scarcely a right, for the violation of which, scarcely an operation of government, for the disturbance of which, the press may not be employed as an instrument. The offences capable of being committed by the press are indeed nearly co-extensive with the whole field of delinquency.

It is not, however, necessary to give a separate definition of every such violation or disturbance, when committed by the press; for that would be to write the penal code a second time, first describing each offence as it appears in ordinary cases, and then describing it anew for the case in which the press is the particular instrument.

If, for the prevention of the violation of rights, it were necessary to give a separate definition, on account of every instrument which might be employed as a means of producing the several violations, the penal code would be endless. In general, the instrument or means is an immaterial circumstance. The violation itself, and the degree of alarm which may attend it, are the principal objects of consideration. If a man is put in fear of his life, and robbed of his purse, it is of no consequence whether he is threatened with a pistol or with a sword. In the definition of a theft, of a fraud, or of a murder, it is not necessary to include an account of all the sorts of means by which these injuries may be perpetrated. It is sufficient if the injury itself be accurately described. The object is to prevent the injury, not merely when produced by one sort of means or another sort of means, but by any means.

From these illustrations, it sufficiently appears, that, if an accurate penal code were composed, defining the violations of rights, and the disturbances of the operations of government, to which penalties were to be annexed, every offence capable of being committed by the press would be

defined without mentioning the press. It is no less evident, that if we include in the term *libel*, as, to the great encouragement of confusion, is generally done, all the offences capable of being committed by the press, we include in the definition of libel all the definitions of the penal code.

As far as persons and property are concerned, the general definition of the acts by which rights are liable to be violated, has always been held sufficient; and has been regarded as including not less the cases in which the instrumentality of the press has been employed, than those in which any other means have been employed to the same end. Nobody ever thought of a particular law for restraining the press on account of the cases in which it may have been rendered subservient to the perpetration of a murder or a theft. It is enough that a law is made to punish him who has been guilty of the murder or theft, whether he has employed the press or any thing else as the means for accomplishing his end.

There can be no doubt, however, that the press is an instrument peculiarly adapted for the commission of injuries against reputation, and for effecting disturbance to the operations of government, while it has no peculiar adaptation for the commission of other offences. Here, too, there is the greatest disposition to restrain the press within improper limits. It is demanded of us, therefore, upon this part of the subject, to enter into greater detail.

We are then to inquire, in the first place, What are the acts of the press with respect to *private reputation*; and next, What are the acts with respect to *government*, which it is desirable that punishment should be employed to restrain.

II.—OFFENCES OF THE PRESS, WITH RESPECT TO PRIVATE RIGHTS.

Agreeably to the principles which have been already considered in the article LAW, no act can be regarded as an offence with respect to an individual, which is not a violation of some of his rights.¹

¹ In the description which follows of that violation of rights which is most liable to be committed by the press, and of the mode

Liberty of the Press. In considering the rights which ought to be established with respect to reputation, one proposition may be assumed; that every man should be considered as having a right to the character which he deserves; that is, to be spoken of according to his actions.

Such Offences should be defined.

In what manner the definition of this right, which would form a part of the civil code, should be expressed, is not now the question; it is evident there is no peculiar difficulty in the matter. As words, not thoughts, are the object of legal cognizance, the right can only have respect to security against certain words; words, imputing to the individual actions which he has not performed, or a disposition to certain actions, without evidence that such a disposition exists.

Suppose that one man has instituted a suit against another, for the offence of having violated, through the press, his right to some part of the reputation which he deserves. In his ground of complaint he must affirm that the man has imputed to him either the performance of actions which he did not commit, or a disposition to certain actions, where no evidence of such disposition can be given.

The words are produced; and the first question is, whether they do or do not impute the actions which, in the complaint, or bill of accusation, they are alleged to impute?

It is to be observed, that they who oppose the attempt to define the offences, which, for shortness, we call the offences of the press, make use of such occasions as this to raise their objections. How, they ask, can all the forms of expression be defined, by which the imputation of such and such actions may be, either more openly, or more covertly, conveyed?

It is very evident that the question, on such an occasion, whether the words do or do not impute such or such actions, is a question of fact. The law says, that such and such actions shall not be imputed, defining the actions. Whether such and such a man has imputed such actions, and whether by one set of words, or another set of words, are questions of fact.

The law, when it said that such and such acts should not be imputed to a man, could not determine whether A, who is accused by B of having imputed to him one of those acts, did so or not. That is to be determined by evidence bearing upon the point. One, and in general the main article of that evidence, are the words which have been used. What is the import of these words, or, which comes to the same thing, what is the degree of proof involved in them, is to be determined, as all questions respecting the weight of evidence are, in each instance, to be determined, by the tribunal before which the accusation is brought. The interpretation of words rests upon the same footing in this, as in all other cases, that, for example, of a will. The law determines, that whatsoever disposition a man has made with respect to his property, shall take effect after his death. But whether A has left his manor of Dale to B, is a matter of fact to be determined by evidence applying to that particular point; principally by that arising from the words of the will.

It may still be argued, by persons who do not easily renounce an opinion to which they have once given their support, that the actions, the imputation of which, the legislature means to prohibit, cannot be defined.

But this is a position which cannot long be maintained.

It is hurtful to a man, if he is believed to have committed some actions, or to have a disposition to commit them; it is not hurtful in the case of others. Evidently it

is by imputation of the first sort alone, that any right with respect to reputation can be infringed. *Liberty of the Press.*

The acts which a man receives injury from being believed to have committed, or to be disposed to commit, are either those to which the law has annexed penalties, or those to which the penalties of public disrepute and dislike are annexed.

With respect to those acts to which the law has annexed penalties, as theft, murder, perjury, and so on, it will not be pretended that there is any difficulty; the law has already defined them, or ought to define them, and they may be marked with perfect precision by a few words.

Those acts which it is hurtful to a man, solely on account of the disrepute and dislike which they produce, to have it believed that he has committed them, may also be with sufficient accuracy determined.

Compensation should be made to the Individual for Injuries sustained by Offences of the Press.

The ends to be attained by punishment are, Reparation to the individual to whom injury has been done, and Prevention of similar acts in future.

In the idea of all punishment, effectual reparation to the injured individual is a necessary and essential ingredient. Suppose, then, it were declared by the legislature that every imputation to a man of acts which bring the evil of dislike and disrepute upon him who has committed them, that is, every false imputation, shall be punished at least by reparation to be made to the party injured; the term *evil* is to this purpose perfectly precise. It would remain with the complainant to show what kind and degree of injury he had received; which is a matter of fact, to be estimated, in each instance, from the evidence adduced, by the tribunal before which the question is brought. If the injury sustained is a pecuniary injury, the question coincides exactly with the question of damages, decided regularly, in English courts, as a question of fact, by the jury.

Injuries of the kind which we are now considering can affect a man only in two ways; either by lessening the pecuniary value which he might otherwise have enjoyed, or by lessening the marks of respect and affection which he would otherwise have received. What the loss is, in this latter instance, is also evidently a question of fact. It has nothing, therefore, to do with the legal definition of the offence, the business of the legislature. It is a question, which, like other questions of fact, must of necessity be determined upon evidence by the tribunal before which it is brought. It is no doubt a question of delicacy, and considerable difficulty, because the evidence must often consist of very fine and minute circumstances, which can seldom be precisely ascertained. But this is not the only class of judicial questions, the determination of which depends upon such evidence as it is very difficult accurately to collect and to weigh. What is of greatest importance, on this occasion, to remark, is, that all the difficulty lies in the matter of fact. There is no doubt or obscurity in the law, which says, that whatsoever hurt a man has sustained through actions or dispositions falsely imputed to him, he shall receive compensation for. Difficulties, however, arising either from the complexity of the matter of fact, or the obscurity of the evidence, no legislative enactments can prevent. These are confided to the skill and integrity of the judge.

The compensation which ought to be made to a man for the diminution of those marks of respect and affection which he would otherwise have received, is a question for

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the legislature. Let us suppose that a soldier has been accused of cowardice, in such a manner as to create a general belief of the truth of the accusation; that a man of honour has been accused of mendacity, or of some of those irregular propensities to which the horror of the public is attached; it is evident that money is not, in such cases, an appropriate compensation.

When a man, through the offence of another, has been deprived of a certain amount of money, or of money's worth, we say that he has received compensation, when he is placed in the same situation in which he would have been if the offence had never taken place.

According to this idea of compensation, a man, against whom an unfavourable opinion has been created by the act of another man, has received compensation, when he is placed in the same situation with regard to the opinion of those with whom he is connected, as if that act had not taken place. This, therefore, is the object which it ought to be the endeavour of the legislature to effect.

One expedient is perfectly appropriate. It is, that the man who has falsely propagated an unfavourable opinion with respect to another, should be made to do whatever is in his power to remove the impression he has made. To this end, he should publish the sentence of the judge, declaring that the action or disposition which he had imputed to the individual injured, he had imputed to him falsely. He should at least be made to publish it in every way in which he had published the imputation. Frequently a more extensive publication might be required.

In some cases, it will be allowed, that thus much would suffice. It may, however, be affirmed, that often the impression would be too profoundly struck, to be effaced by a mere knowledge of the sentence of the judge. In such cases, something more in the way of compensation would be required. On this, it is of importance to be observed, that if the impression produced by an imputation, which, after solemn inquiry, the judge has declared to be false, should not, by that declaration, be completely effaced, it implies necessarily one of two things; either that the public have evidence of the truth of the accusation, which was not adduced to the judge, and then the remaining impression is not owing to the imputation which the judge has condemned, but to the evidence; or, secondly, that the public mind is in a state of gross ignorance and imbecility, capable of forming opinions, even on the clearest subjects, not only not according to evidence, but in opposition to it. If the public mind, however, is in such a deplorable condition, it is the fault of the legislature; and for the rectification of this evil, the best course undoubtedly is, to take effectual measures for the instruction of the people, which instruction would soon place them beyond the danger of such delusions. In the mean time, if something more than the publication of the sentence of the judge were necessary to restore a man to that degree of consideration, of which the false imputation had deprived him, governments have numerous ways of raising the consequence of individuals; and no legislature would be at a loss for a gradation of expedients suited to the scale of demand.

Means which should be used for preventing the Violation of Rights by the Press.

We have now illustrated that part of this question which regards compensation to the injured individual. It remains to inquire what is best to be done in this case, for the attainment of the other object of punishment, namely, the prevention of similar offences in time to come.

To devise a punishment sufficient to prevent an offence, is to provide a motive sufficient to counteract the motive which leads to the offence. We have hence to consider

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what are the motives by which men are incited to make false imputations on the characters of others.

These motives may be of three different sorts. A man may derive *pecuniary profit*, he may derive *comparative distinction*, or he may satisfy his desire of *vengeance* by blackening the character of his neighbour.

In the case in which a man has by calumny wrongfully intercepted the pecuniary receipts of his neighbour, the obligation of making satisfaction to the party injured would, it is obvious, alone suffice, provided the machinery of the laws were sufficiently perfect to render the execution of them certain. Seldom would any man calumniate his neighbour for the sake of placing £20 in his own pocket, if he were sure that, next day, or next week, he would have to restore it, with all the profit which might have been made by the use of it, and with the disgrace besides of having committed an action which other men abhor.

Sometimes, however, a man may derive pecuniary profit from calumniating persons whom he has not by that means deprived of any pecuniary advantage; by the sale, for example, of a slanderous publication; when the satisfaction due to the individual may not be of a nature to counteract the motive which leads to the offence. The expedient in this case, also, is sufficiently obvious, and sufficiently simple. It is necessary to ascertain the whole of the gain which has been made by the offender, and to take it away from him. This, together with the satisfaction which he ought to make to the injured individual, would, if it were certain, create a surplus of motive to abstain from the injurious act.

In both of these cases, if the execution of the law is uncertain, an additional punishment may be necessary, sufficient to compensate for the chance of escape. The allowance to be made on this score must depend upon the imperfection of the laws; while one important fact is to be kept in remembrance, that as severity of punishment, beyond a certain point, is increased, certainty of execution is diminished. The true expedient, therefore, is to render the machinery of the laws so perfect, that the penalties which they denounce may always be sure of execution; and then hardly any thing beyond compensation to the individual, and the abstraction of any additional gain which might have been made by the propagation of slander, would be necessary to repress all offences against the reputation of others, to which the motive was constituted by pecuniary gain.

The two remaining cases are still more simple. If a man propagates a falsehood, for the sake of injuring the character of a man by whom his own consideration is eclipsed, it is only when he expects to obtain by that means a permanent advantage. If he knows that immediately the law will take its hold upon him; that he will be compelled to re-elevate the character of his neighbour, and to proclaim his own disgrace, he will see that, to attempt depressing the character of another man by calumny, is the very worst of all expedients for giving a comparative elevation to his own. The same is the result in the case where vengeance constitutes the motive to injure the reputation of another. To render this proposition manifest, the most obvious illustration will suffice. No man, to gratify his malignity to another person, would kill his ox or his ass, provided he were sure that immediately he would be obliged to make him full satisfaction; and instead of injuring the man whom he hated, to injure only himself. No, the rudeness and inefficacy of the law, holding out a chance of escaping the duty of making reparation, is the sole origin and cause of all offences of this description; and if the law were placed in a state but approaching to perfection, hardly any thing beside the obligation of making satisfaction would be necessary to repress the whole of this order of crimes.

Whether any Imputation by which Truth is not violated, should be considered an Offence by the Press.

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We have now made considerable progress in this important inquiry. We have ascertained, we think, with sufficient evidence, all that is necessary to be done for preventing injuries to the reputation of individuals; provided the rights of reputation are not, by the civil code, made to extend beyond the boundaries of truth. Whether or not they ought to extend farther, and individuals ought to be protected from the disclosure of acts which they may have committed, is, we confess, a question highly worthy of solution; upon which, therefore, before we proceed to any of the subsequent topics, we shall offer the following reflections.

There can be no doubt that the feelings of the individual may be as painful, where actions of a disreputable nature are truly, as where they are falsely, imputed to him. It is equally certain, that no painful feelings ought to be wilfully excited in any man, where no good, sufficient to overbalance that evil, is its natural consequence.

We have already shown, that reputation is injured by the imputation of acts of two different descriptions; first, those to which the law annexes penalties; secondly, those to which disrepute and the dislike of others are annexed.

With respect to those acts to which the law annexes penalties, there is no room for uncertainty or dispute. Unless the law is a bad law, which ought to be repealed (this, we confess, constitutes an exception, and one which, in very imperfect codes, extends a great way), the law ought not to be disappointed of its execution. The man who gives information against a murderer, or a thief, by the press, or without the press, renders a public service, and deserves not punishment, but reward.

It appears, therefore, that the question, whether a man ought to be protected from the imputation of actions which he has really committed, refers solely to those acts which, without being punishable by the law, are attended with disrepute; acts, in other words, which the members of the society disapprove and dislike.

The prospect of the immediate and public exposure of all acts of this description, would be a most effectual expedient to prevent their being committed. Men would obtain the habit of abstaining from them, and would feel it as little painful to abstain, as at present it is to any well educated person to keep from theft, or those acts which constitute the ill manners of the vulgar. The fable of Momus has always been understood to carry an important moral. He found grievous fault that a window had not been placed in the breast of every man, by which, not his actions alone, but his thoughts, might have been known. The magnanimity of that Roman has been highly applauded, who not only placed his residence in such a situation that his fellow-citizens might see as much as possible of his actions, but declared a wish that he could open to all eyes his breast as well as his house.

If the hatred and contempt of the people, therefore, were always rightly directed, and rightly proportioned,—if they never operated against any actions but those which were hurtful, either to the individual himself, or to others, and never, but in the degree in which they were hurtful,—the case would be clear; the advantage which would be derived from the true exposure of any man's actions of any sort, would exceed beyond calculation the attendant evil. The great difficulty of insuring the practice of morality, in those numerous and highly important cases to which the legal sanction, or the *security of pains and penalties*, does not extend, consists in the want of a motive always present, and powerful enough to counteract the instant motive which urges to the instant offence. That motive almost every man would derive from the know-

ledge that he had the eyes upon him of all those the good opinion of whom it was his interest to preserve; that no immoral act of his would escape their observation, and a proportionate share of their hatred and contempt. It is in this view that the aid of religion has been sometimes regarded as of importance to morality, suggesting the idea of a high and constant observer. All motives, however, are feeble, in proportion as the pains and pleasures upon which they depend are distant, vague, or uncertain. Divines agree with all other men in complaining of the trifling effect of religious motives upon the lives of the greater number of men. From the nature of the prospect on which these motives depend, they could not be less feeble than they have been thus described. The case is not the same with the motives arising from the sentiments which we know we shall inspire in the breasts of our fellow-creatures. It is a matter of daily and incontrovertible experience, that these are among the most powerful which operate upon the human mind. The soldier rushes upon death, and endures all the hardships and toils of his cruel profession, that he may enjoy the admiration and escape the contempt of his fellow-men. On what else is founded the greater part of all human pursuits? How few, even of those who toil at the meanest occupations, but exert themselves to have something for show, something to make an impression upon the eyes of those who surround them? The very subject of the present inquiry derives from this source the whole of its importance. The value of reputation is, indeed, but another name for the value which we attach to the favourable and unfavourable sentiments of our fellow-men.

It is, however, true, that their unfavourable sentiments do not always fall where they ought; and this, we confess, is a consideration of the highest importance. It very often happens that men's antipathies are excited to actions from which no evil ensues, either to him who performs them, or to any body else. If any man derives a pleasure from such actions, it is to limit his sphere of innocent enjoyment to debar him from them. And if the press exposes him to the antipathies, the hatred, and contempt of his fellow-creatures, on account of those actions, it produces an evil, uncompensated by the smallest portion of good. To an Indian Brahmin, if he were known to have eaten, even when starving, a morsel of food which had been prepared by a Christian, the consequences would be dreadful. Where the Roman Catholic religion is in vigour, a man who should indulge himself in animal food on forbidden days would be regarded with horror. The use of wine, however moderate, would render a Mahomedan execrable to the whole of his tribe.

This misdirection of the favourable and unfavourable sentiments of mankind; in other words, this perversion and corruption of their moral sentiments, has, in by far the greater number of instances, been the work of priests, contriving the means of increasing their influence. In some very important instances, such, for example, as the prejudices of birth, at one time in Europe so powerful as to make men of low birth objects of the greatest contempt, men of elevated birth objects of the highest veneration, the perversion of the moral sentiments is evidently the work of the aristocratical class, securing to themselves a more easy dominion over the rest of their fellow-creatures.

It is, therefore, evident, that where antipathies, religious or aristocratical, should prevail, the press would be hurtfully employed in giving notoriety to the facts which would expose a man to the operation of either.

We have now ascertained the cases in which it would not be good that men should be protected from the declaration of truth by the press, and also the cases in which it would be good that they should be so protected.

What, upon this view of the subject, would be desirable,

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is sufficiently clear. It would be desirable that, in the one set of cases, the declaration should be allowed, in the other it should not be allowed. Are the two sets of cases, however, capable of being accurately distinguished?

If the comparison is made with any attention, it will not be difficult to determine that the evil to be incurred by the loss of truth in the set of cases in which the declaration of it would be useful, is much greater than that which would arise from permitting the declaration in the cases in which it would be hurtful.

In the first place, the set of cases in which the declaration would be useful are much more numerous, and much more important, than those in which, in any tolerably civilized state of society, it would be hurtful. Those in which it would be useful embrace the whole field of morality, all those acts, the performance of which, on account of their singular importance, has been elevated to the rank of virtues. Every body believes and proclaims, that the universal practice of the moral virtues would insure the highest measure of human happiness; no one doubts that the misery which, to so deplorable a degree, overspreads the globe, while men injure men, and, instead of helping and benefiting, supplant, defraud, mislead, pillage, and oppress one another, would thus be nearly exterminated, and something better than the dreams of the golden age would be realized upon earth. Toward the attainment of this most desirable state of things, nothing in the world is capable of contributing so much as the full exercise of truth upon all immoral actions, that is, all actions, the practice of which is calculated to lessen the amount of human happiness. According to this view, the justice of which it is impossible to dispute, the evil incurred by forbidding the declaration of truth upon all immoral actions is incalculable. That which would be incurred by the antipathies of misguided minds against actions innocent in themselves, nobody, we should imagine, would so much as think of placing in comparison.

In our own country, for example, the classes of actions which, though they injure nobody, expose a man to the unfavourable sentiments of others, are not numerous. The number of persons who would be exposed to inconvenience on account of the declaration of truth in regard to them, would be small in comparison with those who would benefit by its declaration in the case of all really hurtful acts.

It is, indeed, important to be observed, that a comparative smallness of number is necessarily implied in the supposition of injury from any unfounded antipathy. Those who share in the antipathy, of course, abstain from the action. And unless the antipathy were so general as to include almost the whole of the society, it would lose its injurious effect. Besides, all the injury which can be done to the individuals against whom truth would in this manner operate injuriously, would be, to make them abstain from the acts which were thus condemned.

Another thing to be considered is, that the whole of the evil arising from the exercise of truth is dependent upon an accidental circumstance, capable of being removed; upon a mental disease, requiring to be cured, which the legislature ought to be constantly endeavouring to cure, and toward the cure of which truth is likely to operate as the most effectual of all expedients. If any considerable inconvenience were experienced from exposure to unfounded antipathies, in consequence of the publication of truth, the groundlessness of these antipathies could not fail in this case to be so often canvassed, and made to appear, that at last it would become familiar to the multitude, and the antipathies would expire.

It clearly, therefore, appears, that, if the cases in which the declaration of truth would expose to unfounded prejudices could not be clearly defined, and separated from the cases in which the declaration would be salutary, the rule of permitting truth ought to be universal. But,

though we perceive, that, to a considerable extent, there Liberty of agreement in drawing the line of distinction between what is hurtful and what is not, we are persuaded that principles might be laid down in which all would agree, and which would serve to mark out certain cases for exception with sufficient exactness. If any such cases could be separated, either of actions, which, though injurious to nobody, excited antipathies, or of facts, as those of birth, for which, though a man was in no respect worse, he might be regarded as worse; the exercise of truth, with regard to them, might, on the express ground that they were actions innoxious, or facts which ought to be of no importance in the estimate of human worth, be forbidden, when injurious, under the penalty of at least making reparation for all the injury of which it had been the cause.

III.—OFFENCES OF THE PRESS WITH RESPECT TO GOVERNMENT.

We have now explained, we trust with sufficient clearness for the present occasion, the principles upon which laws should be constructed for protecting the *rights of individuals* against violations committed by the press. The first part of this inquiry, therefore, we must consider as completed. In the second part we have to explain the principles upon which they should be constructed for protecting the *operations of government*.

Exhortations to obstruct the Operations of Government in detail should, Exhortations to resist all the Powers of Government at once should not, be considered Offences.

Unless a door is left open to resistance of the government, in the largest sense of the word, the doctrine of passive obedience is adopted; and the consequence is, the universal prevalence of misgovernment, insuring the misery and degradation of the people. On the other hand, unless the operations of government, instituted for the protection of rights, are secured from obstruction, the security of rights, and all the advantages dependent upon the existence of government, are at an end. Between these two securities, both necessary to obtain the benefits of good government, there appears to be such a contrariety, that the one can only be obtained by the sacrifice of the other.

As this difficulty, however, arises chiefly from the extent of the terms, a close inspection of the cases which they involve, and which they have a tendency to confuse, will enable us to discover the course which it belongs to practical wisdom to pursue.

It is necessary, first of all, to ascertain what sort of obstructions are inconsistent, and what are not inconsistent, with those operations of government which are necessary for the protection of rights.

The application of physical force to resist the government in applying to the execution of the laws the physical power placed at its disposal by the law, is such an obstruction of the operations of government, as would, if frequent, render it inadequate to the ends which it is provided to secure. This application of force, therefore, must be treated as an offence; and any thing proceeding from the press, tending directly to produce it, as a similar offence.

This proposition requires to be illustrated. The application of physical force which is here described, and treated as an evil, is clearly distinguishable from that resistance of government which is the last security of the many against the misconduct of the few. This is an application of physical force to obstruct the operations of government in detail; the proceedings, for example, of a court of jus

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tice; the proceedings of the legislative organ, or the proceedings of any of the administrative functionaries, in the execution of the duties with which they are charged. This is not that species of resistance which is necessary, in the last resort, to secure the people against the abuse of the powers of government. This last is not a resistance to the operations of government in detail. It is a resistance to all the powers of government at once, either to withdraw them from the hands in which they have hitherto been deposited, or greatly to modify the terms upon which they are held.

Even this last species of resistance it may be necessary to punish, at least in a certain degree, whenever it is not successful; that society may not be disturbed by commotions which the majority of the people disapprove. This, however, is a question which belongs to the penal code in general, and does not concern the inquiry into the offences capable of being committed by the press; because we think it may be satisfactorily shown, that no operation of the press, however directly exhorting to this species of resistance, ought to be treated as an offence.

The reason is, that no such exhortation can have any immediate or formidable effect; can, indeed, have any effect at all, except through such mediums as ought to be at all times perfectly free. Suppose that a work is published, exhorting the people in general to take arms against the government, for the purpose of altering it against the consent of its rulers. The people cannot take arms against the government without the certainty of being immediately crushed, unless there has been already created a general consent. If this consent exists in such perfection as to want nothing to begin action but an exhortation, nothing can prevent the exhortation; and forbidding it is useless. If the consent does not exist in nearly the last degree of perfection, a mere exhortation, read in print, can have no effect which is worth regarding. In all circumstances, therefore, it is useless, and consequently absurd, to treat this species of exhortation as an offence. If, on the other hand, it were clearly recognised, that every man had a license to exhort the people to the general resistance of the government, all such exhortations would become ridiculous, unless on those rare and extreme occasions on which no prohibitions and no penalties can or ought to prevent them. The doctrine of this paragraph, which will appear somewhat startling and paradoxical to minds accustomed only to a certain train of ideas, will receive illustration, and we trust will be amply confirmed, as we proceed.

Having mentioned this as a grand exception, we now return to the cases in which not only physical force applied to obstruct the operations of government, but the publishing of exhortations to that obstruction, ought to be treated as an offence. These relate solely, as above remarked, to the operations of government in detail. Obstructions, it is evident, may be offered to the operations in detail of a government which possesses and deserves the fullest confidence of the community at large; and the press may be employed in directly and efficiently exciting to these obstructions. A hand-bill, for example, distributed at a critical moment, and operating upon an inflamed state of mind, in a narrow district, may excite a mob to disturb the proceedings of a court of justice, to obstruct public officers in the execution of their duties, or even to disturb, on this or that occasion, the deliberations of the legislature itself.

These are clearly hurtful acts; they may be very accurately defined; and penalties, of moderate severity, would be sufficient to deter from the performance of them. Satisfaction by the party offending to the party injured, would often, in offences of this description, be out of the question; because there would be no definite party to

whom an injury would be occasioned. It would only be necessary to ascertain the sorts of motives by which such offences would be liable to be produced, and to apply skilfully, as in other cases, motives of an opposite tendency, sufficient to counteract them. This would not be more difficult in this than in other cases, and it is not, therefore, necessary to explain at any length the mode of performing it.

One principle is to be carefully and most religiously observed, that of not imposing an atom of punishment for the purposes of *vengeance*. This is a principle, the justness and importance of which are so completely recognised, that we might have expected to be relieved ere now from the necessity of recommending attention to it. The fact, however, is, that so long as there are abuses in governments, so long will the men, who have the means of profiting by those abuses, exert themselves to multiply the list of offences against government, and to apply to them punishments of the greatest severity.

Punishments for contempt of court; punishments to vindicate the honour of the court, of the government, of the magistracy; punishments for the support of dignity; punishments severe in proportion as the dignity of the party offended is supposed to be high, and so on, are punishments almost always applied for purposes of vengeance, or the protection of the instruments of abuse. They are punishments, therefore, which will be rigidly excluded from a code which wisely and steadily pursues the general good.

Of Exhortations to obstruct the Operations of Government in detail, there are two Sorts: 1. The Direct; 2. The Implied, or Constructive.

What the *sort of acts* are, to which the exhortations of the press ought not to be applied, has been so far ascertained. The next point is, to determine with accuracy what *sort of exhortation* it is that ought to be forbidden.

To all those who profit by the abuses of government, that is, more especially, to all those who, in a defective government, wield any of its powers, it is of great importance to leave as undefined as possible the sort of exhortation that ought to be forbidden. The point of greatest importance to them is, to keep the people at large from complaining, or from knowing or thinking that they have any ground of complaint. If this object is fully attained, they may then, without anxiety, and without trouble, riot in the pleasures of misrule: there is no limit to the degree in which the few may pursue their own advantage at the expense of the many.

There can be nothing, therefore, in which they have a greater interest, than preventing the press from being employed in any such way as will lead the people to think that they have any thing, on the part of their rulers, of which to complain. All artifices possible will be sure to be employed to effect that prevention. And if it is enacted, that exhortations to acts which obstruct the operations of government in detail should be punished, *without defining accurately what sort of exhortations*, they will easily find expedients; which will, to a great extent, accomplish their purpose.

Under the sort of constructions which it will be their interest to apply, every thing which can be done by the press to make the people know or believe that there is any thing in the system of their government, or the conduct of their rulers, of which they have to complain, may be treated as an exhortation to obstruct the operations of government. Of these constructions our experience affords innumerable examples. Does not the imputing of defects to the government, or misconduct to those who wield the powers of government, tend to bring both "into

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hatred and contempt?" And if the people hate and condemn the institutions and rulers of their country, will they not oppose their operations? The imputing of these faults, therefore, is it not, in essence and effect, an exhortation to oppose the operations of government? And are we to be governed, in our legislature, by the mere forms in which a set of words may appear, and not by our knowledge of their nature and consequences?

This is not only exceedingly plausible, but almost all the propositions which it involves are true. It is thus, therefore, the more easy to establish such a mode of interpreting an indefinite law of the press, as will prevent, or, where the people cannot yet bear a total prevention, will go far towards preventing, whatever can lead the people to believe that any thing is amiss in the manner in which they are ruled.

There are two species of exhortations, the one explicit and direct, the other implied and constructive. In the one, a particular act is pointed out, and the party or parties addressed are called upon to perform it. In the other, certain grounds are only laid, from which the opinion of the addresser, that the act ought to be performed, may, with more or less certainty, be inferred.

With respect to the first, there is no occasion for doubt. A direct and explicit exhortation to commit one of those acts, described above as obstructing the operations of government in detail, should be treated as an offence. The precise question is, whether any exhortation, which is only implied and constructive, should be considered an offence? In the answer to this question, almost every thing which relates to the use of the press in matters of government will be found to be involved.

Exhortations which are Implied and Constructive, ought not to be punished.

We have already divided the subject of resistance to government into two parts; first, that general resistance, the object of which is some great change in the government at large; and, secondly, resistance to this or that of its operations in detail.

We have already adduced an argument, which appears to us to be conclusive, to show that no exhortation, whether explicit or implied, direct or indirect, the object or tendency of which is to produce the first species of resistance, ought to be subject to legal restraint.

It is necessary here to enter a little more fully into the grounds of that opinion.

We think it will appear, with sufficient evidence, that, in the way of indirect exhortation to resistance, that is, in laying the grounds of dissatisfaction with the government, there is no medium between allowing every thing and allowing nothing; that the end, in short, which is sought to be gained, by allowing any thing to be published in censure of the government, cannot be obtained, without leaving it perfectly free to publish every thing.

The end which is sought to be obtained by allowing any thing to be said in censure of the government, is, to censure the goodness of the government; the most important of all the objects to the attainment of which the wisdom of man can be applied. If the goodness of government could be insured by any preferable means, it is evident that all censure of the government ought to be prohibited. All discontent with the government is only good, in so far as it is a means of removing real cause of discontent. If there is no cause, or if there is better means of removing the cause, the discontent is, of course, an evil, and that which produces it an evil.

So true it is, however, that the discontent of the people is the only means of removing the defects of vicious governments, that the freedom of the press, the main instru-

ment of creating discontent, is, in all civilized countries, Liberty of among all but the advocates of misgovernment, regarded the Press. as an indispensable security, and the greatest safeguard of the interests of mankind.

For what is meant by a vicious government? or where-in do the defects of government consist? Most assuredly they all consist in sacrificing the interests of the many to the interests of the few. The small number, in whose hands the powers of government are, in part directly, in part indirectly, placed, cannot fail, like other men, to have a greater regard for what is advantageous to themselves, than what is advantageous to other men. They pursue, therefore, their own advantage, in preference to that of the rest of the community. That is enough. Where there is nothing to check that propensity, all the evils of misgovernment, that is, in one word, the very worst evils by which human nature is afflicted, are the inevitable consequence.

There can be no adequate check without the freedom of the press. The evidence of this is irresistible. In all countries, the people either have a power legally and peaceably of removing their governors, or they have not that power. If they have not that power, they can only obtain any considerable ameliorations of their governments by resistance, by applying physical force to their rulers, or, at least, by threats so likely to be followed by performance, as may frighten their rulers into compliance. But resistance, to have this effect, must be general. To be general, it must spring from a general conformity of opinion, and a general knowledge of that conformity. How is this effect to be produced, but by some means, fully enjoyed by the people, of communicating their sentiments to one another? Unless where the people can all meet in general assembly, there is no other means of attaining this object, to be compared with the freedom of the press.

It is, no doubt, true, that in countries where the liberty of the press is unknown, bad governments are frequently overthrown. This is almost always accomplished by the military force, revenging some grievance of their own, or falling in with some heat and animosity of the people. But does it ever enable them to make a new government, in which any greater security is provided for their interests than there was before? In such cases, the people get rid of one set of rulers, whom they hate, only to obtain another set, with equal powers of doing them injury.

There are, however, we believe, some people who say, that though the liberty of the press is a necessary instrument to attain good government, yet, if it is fairly attained, and if legal and peaceable means are in the hands of the people of removing their governors for misconduct; if the people of England, for example, really chose the members of the House of Commons, and renewed their choice so frequently, as to have the power of removal after a short experience of misconduct; the freedom of the press would be unnecessary.

So far is this from being true, that it is doubtful whether a power in the people of choosing their own rulers, without the liberty of the press, would be an advantage.

Freedom of Censure on the Conduct of their Rulers, is necessary for the good of the People.

It is perfectly clear that all chance of advantage to the people, from having the choice of their rulers, depends upon their making a good choice. If they make a bad choice, if they elect people either incapable, or disinclined, to use well the power intrusted to them, they incur the same evils to which they are doomed when they are deprived of the due control over those by whom their affairs are administered.

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We may then ask, if there are any possible means by which the people can make a good choice, besides the *liberty of the press*? The very foundation of a good choice is knowledge. The fuller and more perfect the knowledge, the better the chance, where all sinister interest is absent, of a good choice. How can the people receive the most perfect knowledge relative to the characters of those who present themselves to their choice, but by information conveyed freely, and without reserve, from one to another?

There is another use of the freedom of the press, no less deserving the most profound attention, that of making known the conduct of the individuals who have been chosen. This latter service is of so much importance, that upon it the whole value of the former depends.

This is capable of being rigidly demonstrated. No benefit is obtained by making choice of a man who is well qualified to serve the people, and also well inclined to serve them, if you place him in a situation in which he will have preponderant motives to serve himself at their expense.

If any set of men are chosen to wield the powers of government, while the people have not the means of knowing in what manner they discharge their duties, they will have the means of serving themselves at the expense of the people; and all the miseries of evil government are the certain consequence.

Suppose the people to choose the members of the legislative assembly, with power of rechoosing or dismissing them at short intervals; to what desirable end could these powers be exercised, without the liberty of the press? Suppose that any one of those whom they have chosen has misconducted himself, or promoted, as far as depended upon him, the ends of misgovernment, how are the people to know that the powers with which they had intrusted him had been treacherously employed?

If they do not know, they will rechoose him, and that as cordially as the man who has served them with the greatest fidelity. This they are under a deplorable necessity of doing, even to be just; for, as they know no difference between him and the best, it would be on their part iniquity to make any. The consequences would be fatal. If one man saw that he might promote misrule for his own advantage, so would another; so of course would they all. In these circumstances we see laid the foundation on which, in every country, bad government is reared. On this foundation it is impossible that it should not be reared. When the causes are the same, who can expect that the effects will be different? It is unnecessary to dwell upon these fundamental truths, because they underlie every consideration of the theory of government.

Without the knowledge, then, of what is done by their representatives, in the use of the powers intrusted to them, the people cannot profit by the power of choosing them, and the advantages of good government are unattainable. It will not surely cost many words to satisfy all classes of readers, that, without the free and unrestrained use of the press, the requisite knowledge cannot be obtained.

That an accurate report of what is done by each of the representatives, a transcript of his speeches, and a statement of his propositions and votes, is necessary to be laid before the people, to enable them to judge of his conduct, nobody, we presume, will deny. This requires the use of the cheapest means of communication, and, we add, the free use of those means. Unless every man has the liberty of publishing the proceedings of the legislative assembly, the people can have no security that they are fairly published. If it is in the power of their rulers to permit one person, and forbid another, the people may be sure that a false report, that is, a report calculated to

make them believe that they are well governed when they are ill governed, will be often presented to them.

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One thing more is necessary, and so necessary, that if it is wanting, the other might as well be wanting also. The publication of the proceedings tells what is done. This, however, is useless, unless a correct judgment is passed upon what is done.

We have brought this inquiry, then, to an important point. From the very theory of government we may see that, unless the people held in their own hands an effectual power of control on the acts of their government, the government will be inevitably vicious. We have now seen that they cannot exercise this control to any beneficial purpose, without the means of forming a correct judgment upon the conduct of their representatives. We have likewise seen, that one of the means necessary to enable them to judge correctly of the conduct of their representatives, is the liberty to every body of publishing reports of what they do. It remains to inquire by what other acts the press can be made to contribute to the same desirable end.

What is wanted is, that all the people, or as many of them as possible, should estimate correctly the consequences of the acts proposed or done by their representatives, and also that they should know what acts might have been proposed, if the best were not proposed, from which better consequences would have followed. This end would be accomplished most effectually, if those who are sufficiently enlightened would point out to those who are in danger of mistakes, the true conclusions; and, showing the weight of evidence to be in their favour, should obtain for them the universal assent.

How is this to be accomplished? In what manner are those wise men to be chosen? And who are to be the choosers? Directly the object cannot be attained. There are no distinct and indubitable marks by which wisdom, and less by which integrity, is to be known. And who is to be trusted with the privilege of pointing them out? They whose judgment requires to be directed are not well qualified to determine who shall direct them. And if the rulers are to choose, they will employ none but those who will act in conformity to their views, and enable them to benefit themselves by the pillage and oppression of the people.

As there is no possible organ of choice, no choice whatever ought to be made. If no choice is to be made, every man that pleases ought to be allowed. All this is indubitable. The consequences of denying any part of it are so obvious, that hardly any man, we suppose, will risk the imputations to which such a denial would justly expose him.

They who say that no choice ought to be made, say, in effect, that no limit whatsoever ought to be imposed upon the liberty of the press. The one of these propositions is involved in the other. To impose any restraint upon the liberty of the press, is undoubtedly to make a choice. If the restraint is imposed by the government, it is the government that chooses the directors of the public mind. If any government chooses the directors of the public mind, that government is despotic.

Suppose that, by the restraint imposed upon the liberty of the press, all censure of the government is forbidden; here is undoubtedly a choice. The government, in this case, virtually says, the people who might attempt the task of directing the public mind are of two sorts; one, those who would censure; another, those who would not censure; I choose the latter.

Suppose that not every censure, but only such and such kinds of censure, are forbidden; here, again, is still a choice, while confessedly there is no party to whom the power of choosing for the rest can with safety be given.

If not every censure, but only some censures, are to be

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It will not be said that any censure which is just should be forbidden; because that would undoubtedly be to detract from the means of enabling the people to form correct judgments; and we have, we trust, rendered it indisputable that no source of benefit to society is at all to be compared with that of correct judgments, on their government and its functionaries, formed by the people, and determining their actions.

But what censures are just and what are unjust; in other words, what are the conclusions which ought to be formed respecting the properties and the acts of the government, is exactly the point to be determined. If you say that no man is to pass an unjust censure upon the government, who is to judge? It is surely unnecessary to repeat the proof of the proposition, that there is nobody who can safely be permitted to judge. The path of practical wisdom is as clear as day: all censures must be permitted equally, just and unjust.

Where various conclusions are formed among a number of men, upon a subject on which it would be unsafe, and therefore improper, to give any minor portion of them a power of determining for the rest, only one expedient remains. Fortunately, that is an expedient, the operation of which is powerful, and its effects beneficial in the highest degree. All the conclusions which have formed themselves in the minds of different individuals should be openly adduced, and the power of comparison and choice should be granted to all. Where there is no motive to attach a man to error, it is natural to him to embrace the truth; especially if pains are taken to adapt the explanation to his capacity. Every man possessed of reason is accustomed to weigh evidence, and to be guided and determined by its preponderance. When various conclusions are, with their evidence, presented with equal care and with equal skill, there is a moral certainty, though some few may be misguided, that the greater number will judge right, and that the greatest force of evidence, wherever it is, will produce the greatest impression.

As this is a proposition upon which everything depends, it is happy that the evidence of it should be so very clear and striking. There is, indeed, hardly any law of human nature more generally recognised, wherever there is not a motive to deny its existence. "To the position of Tully, that if Virtue could be seen, she must be loved, may be added," says Dr Johnson, "that if Truth could be heard, she must be obeyed." (*Rambler*, No. 87.) "Je vous plains, mes Pères," says M. Pascal to the Jesuits "d'avoir recours à de tels remèdes. Vous croyez avoir la force et l'impunité: mais je crois avoir la vérité, et l'innocence. C'est une étrange et longue guerre que celle où la violence essaie d'opprimer la vérité. Tous les efforts de la violence ne peuvent affaiblir la vérité, et ne servent qu'à la relever d'avantage: toutes les lumières de la vérité ne peuvent rien pour arrêter la violence, et ne font que l'irriter encore plus. Quand la force combat la force, la plus puissante détruit la moindre: quand l'on expose les discours aux discours, ceux qui sont véritables et convainquants confondent et dissipent ceux qui n'ont que la vanité et le mensonge." (*Lettres Provinciales*, 12.)—"Reason," says Burke, "clearly and manfully delivered, has in itself a mighty force; but reason, in the mouth of legal authority, is, I may fairly say, irresistible." (*Letter on a Regicide Peace*.)

It is of importance to show how many of the greatest men, of all ages and countries, have borne testimony to the prevalence of true over false conclusions, when both

are fairly offered to the human mind. "Truth," says Mr Locke, "certainly would do well enough, if she were once left to shift for herself. She seldom has received, and I fear never will receive, much assistance from the power of great men, to whom she is but rarely known, and more rarely welcome. She is not taught by laws, nor has she any need of force to procure her entrance into the minds of men." (*Letter on Toleration*.) The following is the emphatical language of Montesquieu:—"La raison a un empire naturel; elle a même un empire tyrannique: on lui résiste, mais cette résistance est son triomphe, encore un peu de temps, et l'on sera forcé de revenir à elle." (*Esprit de Loix*, l. xxviii., ch. 38.) "It is noted out of Cicero, by Machiavel, that the people, though they are not so prone to find out truth of themselves, as to follow custom, or run into error, yet if they be shown truth, they not only acknowledge and embrace it very suddenly, but are the most constant and faithful guardians and conservators of it." (*Harrington*.) "The labour of a confutation," says Chillingworth, "I have not in any place found such labour or difficulty, but that it was undertakeable by a man of very mean abilities; and the reason is, because it is Truth I plead for; which is so strong an argument for itself, that it needs only light to discover it." (*Religion of Protestants*.) About things on which the public thinks long," says Dr Johnson, "it commonly attains to think right." (*Life of Addison*.) "The adversary," says Dr Campbell, "is both subtle and powerful. With such an adversary, I should on very unequal terms enter the lists, had I not the advantage of being on the side of truth. And an eminent advantage this doubtless is. It requires but moderate abilities to speak in defence of a good cause. A good cause demands but a distinct exposition, and a fair hearing; and we may say, with great propriety, it will speak for itself." (*Campbell on Miracles*, Introd.)

We have, then, arrived at the following important conclusions, viz.,—That there is no safety to the people in allowing anybody to choose opinions for them; that there are no marks by which it can be decided beforehand what opinions are true and what are false; that there must, therefore, be equal freedom of declaring all opinions, both true and false; and that, when all opinions, true and false, are equally declared, the assent of the greater number, when their interests are not opposed to them, may always be expected to be given to the true. These principles, the foundation of which appears to be impregnable, suffice for the speedy determination of every practical question.

All censure thrown upon the government, all censure thrown either upon the institutions of the government, or upon the conduct of any of the functionaries of government, supreme or subordinate, has a tendency to produce resistance to the government.

Of the censures thrown upon government, some may have a tendency to produce resistance to the operations of government in detail; others that general resistance which has in view some great alteration in the government.

Of the first sort would be any such accusation of the conduct and disposition of a judge as might excite the people, whose sympathies were roused in favour of the individual against whom his sentence was to operate, to rescue him from the officers of justice. We have already shown that such a rescue ought to be punished, and any direct exhortation to it ought to be punished. It will now be evident, we trust, that no censure on the judge, though capable of being treated as an indirect exhortation, ought to be punished.

The reason is conclusive. The people ought to know, if possible, the real qualities of the actions of those who are intrusted with any share in the management of their affairs. This they have no chance of knowing, without the

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Liberty of unlimited power of censure upon those actions, both in gross and detail. To see the full force of these propositions, it is only necessary to apply the principles which have been already established.

If the people have not the means of knowing the actions of all public functionaries, they have no security for the good conduct even of their representatives. Suppose it is the duty of their representatives to watch the conduct of the judges, and secure the perfection of judicature, the people cannot know whether their representatives perform this duty, unless they know what the conduct of the judges is. Ignorance of this would of itself suffice to vitiate the government. A door would be left open, through which the rulers might benefit themselves at the expense of the people. All the profit to be made by an abuse of the power of justice, would thus become the profit of the representatives, by whom it would be allowed and encouraged, as far as the knowledge which they could not withhold from the people would permit.

That the people ought, therefore, to know the conduct of their judges, and when we say judges we mean every other functionary, and the more perfectly the better, may be laid down as indubitable. They are deprived of all trust-worthy means of knowing, if any limit whatsoever is placed to the power of censure.

All censure consists in the delivery of an unfavourable opinion, with or without the grounds of it. This is the essence of censure. But if the conduct of the judge deserves that an unfavourable opinion should be entertained of it, the more perfectly that is known to the people the better.

The conduct of the judge, on this occasion, says a defender, does not deserve an unfavourable opinion. A public expression of such an opinion ought, therefore, to be prohibited. But there are occasions on which the conduct of judges deserves an unfavourable opinion. When it is deserved, there is no security for good government, unless it is allowed to be made known. How can you allow an unfavourable opinion to be delivered in the one case, and not delivered in the other? To have the benefit of it in the one case, you must submit to the evil of it in the other.

In matters of Government, undeserved Praise is as mischievous as undeserved Blame.

As the real point of importance is, to establish correct opinions in the minds of the people, it is as mischievous to inculcate a favourable opinion when an unfavourable is deserved, as an unfavourable when a favourable is deserved; and, in the eye of reason, it is incontrovertible, that, if the one deserves to be prevented by punishment, so does the other.

But if an unfavourable opinion is pronounced of any public functionary—of a judge, for example—would you have it left uncontradicted? Would you not grant the liberty of calling in question the truth of the allegations, and of supporting a different opinion? If not, the character of no public functionary would be safe, and any man, however deserving, might be made to appear the proper object of the most unfavourable sentiments. Why should not the two cases be treated equally? Why should not the favourable, as well as the unfavourable opinion, be open to contradiction.

It is perfectly certain, that it is not in the power of law to mark out, by antecedent definition, any sort of men, of whom it can say, all opinions favourable to such men shall be punished. It can never be affirmed of any men beforehand, that they will certainly perform such and such injurious actions. If they do not perform them, all declarations conformable with the matter of fact are good. But

the question is, whether they have performed them? One Liberty of man affirms that they have. Is that to be taken for granted? the Press. And is no man to be allowed to affirm the contrary, and to suit the grounds upon which the allegations of the other man are supported? It is by weighing well the evidence on both sides that a well-rounded opinion is capable of being formed. And it is certain, that the best security for having the evidence on both sides fully adduced, and the strength and weakness of it perfectly disclosed, is by permitting all those who are attached to different opinions to do what they can for the support of them.

If it is evident that it ought not to be permitted to speak evil of public functionaries without limit, while any limit is put to the power of speaking well of them; it is equally evident that, for the purpose of forming a correct opinion of their conduct, it ought not to be permitted to speak well of them, and oppose any limit whatsoever to the power of speaking ill of them.

It ought not to be permitted to speak evil of them without an equal liberty of speaking well; because, in that case, the evidence against them might be made to appear much stronger than it was. It ought not to be permitted to speak well of them without an equal liberty of speaking ill; because, in that case, the evidence in favour of them might be made to appear much greater than it really was. In either case, the people would be misguided, and defrauded of that moral knowledge of the conduct of their rulers, the paramount importance of which has so fully appeared.

It may be said (as by the short-sighted, if we did not anticipate them, it would be said), that if, by limiting the power of censure, the people are made to judge more favourably of their rulers than they deserve, the evil is small; but if they are permitted to form a very unfavourable opinion, the consequences are alarming.

We believe it may be rigidly demonstrated, that no evils are greater than those which result from a more favourable opinion of their rulers, on the part of the people, than their rulers deserve; because just as far as that undue favour extends, bad government is secured. By an opinion of their rulers more favourable than they deserve, is implied an ignorance on the part of the people of certain acts of their rulers by which the people suffer. All acts by which the rulers have any motive to make the people suffer, are acts by which the rulers profit. When the ignorance of the people extends to material points, all the evils of bad government are secured. These are the greatest of all possible evils. To this it will not be said that the ignorance of the people ought to extend. On all material points, it is admitted, then, that the freedom of censure ought to be complete. But if it is to be allowed on great points, on those where it is calculated to excite the greatest disapprobation; what can be thought of their consistency, who would restrain it on those where it is only calculated to excite a small? If it is proper to protect the people from great injuries at the hands of their rulers, by exciting a strong, it is good to protect them against small injuries, by exciting a weak disapprobation.

To public functionaries may be imputed either acts which they have not performed, or a want of certain qualifications, moral or intellectual, which they ought to possess.

With respect to acts, and even dispositions, which do not, either directly or indirectly, concern their public function, the same protection may be safely extended to them as to private men.

Acts, in their public capacity, which they have not performed, may be imputed to them either by mere forgery, and without any appearance of ground, or they may be imputed with some appearance of ground. From permitting the former, no good can be derived. They ought, there-

Liberty of the Press. injurious to individuals in their private capacity. That there should be no restraint in imputing actions to any public functionary which he may appear to have done, flows immediately from the principles already established, and requires not that any thing should here be added to its proof. Any appearance sufficient to lay the foundation of the slightest suspicion, renders it useful to call the attention of the public to the suspected part, which can only be done by making the suspicion known. A man may, indeed, publish, as a matter of fact, what is supported by appearances which would only justify the slightest suspicion. In that case, he is sure of incurring the disgrace of temerity, if not of malignity; and this is all the penalty which needs or can safely be inflicted upon him.

In imputing inaptitude to a public functionary, on the score either of intellectual or moral qualities, scarcely any limitation would be safe. Every man ought to have liberty to declare upon this subject any opinion which he pleases, and support it by any evidence which he may think adapted to the end. If, in supporting his opinion of the inaptitude of any public functionary, he imputes to him actions which there is not even an appearance of his having performed, that limited prohibition, the propriety of which we have just recognised, will strictly apply. With this exception, freedom should be unimpaired.

We have now, therefore, explained, we hope sufficiently, in what manner the principles which we have established require that the use of the press should be regulated in speaking of the actions of public functionaries, and of their fitness for the duties which they are appointed to discharge, whether those functionaries are the immediate representatives of the people, or others whom it is the business of those representatives to control.

Freedom of Censure on the Institutions of Government is necessary for the good of the People.

We have next to inquire in what manner those principles require that the use of the press should be regulated in speaking of the *institutions* of government. The illustrations already adduced will supersede the use of many words upon this part of the subject.

Institutions of government are good in proportion as they save the people from evil. Institutions of government are bad in proportion as they are the cause of evil to the people, either by what they create, or what they fail in preventing.

According to this statement, which it is impossible to controvert, institutions of government may, in strict propriety of speech, be said to be the cause of all the evil which they do not save the people from, and from which the people would be saved by any other institutions.

It is therefore of the highest importance that the people should know what are the institutions which save from the greatest quantity of evil, and how much their own institutions want of being those best institutions.

Institutions of government are bad, either because those in whose hands the powers of government are placed, do not know that they are bad, and, though willing, cannot improve them; or they are bad, because those who have in their hands the powers of government do not wish that they should be improved.

When the rulers are willing, but do not know how to improve the institutions of government, every thing which leads to a knowledge of their defects is desirable to both rulers and people. That which most certainly leads to such knowledge is, that every man who thinks he understands any thing of the subject, should produce his opinions, with the evidence on which they are supported, and that every man who disapproves of these opinions should state his ob-

jections. All the knowledge which all the individuals in the society possess upon the subject is thus brought, as it were, to a common stock or treasury; while every thing which has the appearance of being knowledge, but is only a counterfeit of knowledge, is assayed and rejected. Every subject has the benefit of becoming thoroughly understood, when, by the delivery of all opinions, it is presented in all points of view; when all the evidence upon both sides is brought forward, and all those who are most interested in showing the weakness of what is weak in it, and the strength of what is strong, are, by the freedom of the press, permitted, and by the warmth of discussion excited, to devote to it the keenest application of their faculties. False opinions will then be delivered. True; but when are we most secure against the influence of false opinions? Most assuredly when the grounds of those opinions are the most thoroughly searched. When are the grounds of opinions most thoroughly searched? When discussion upon the subject is the most general and the most intense; when the greatest number of qualified persons engage in the discussion, and are excited by all the warmth of competition, and all the interest of important consequences, to study the subject with the deepest attention. To give a body of rulers, or any other body of men, a power of choosing, for the rest, opinions upon government, without discussion, we have already seen, upon good evidence, is the way to secure the prevalence of the most destructive errors.

When institutions are bad, and the rulers would gladly change them if they knew they were bad, discussion, it will not be disputed, would be good for both parties, rulers and ruled. There is, however, another case, and that by far the most common, where the rulers are attached to the bad institutions, and are disposed to do all in their power to prevent any alteration. This is the case with all institutions which leave it in the power of the men who are intrusted with the powers of government, to make use of them for their own advantage, to the detriment of the people; in other words, which enable them to do injury to the people, or prevent the people from good. This is the case with by far the greater number of those institutions by which the people suffer. They are institutions contrived for benefiting the few at the cost of the many.

With respect, therefore, to the greater number of defective institutions, it is the interest of the rulers that true opinions should not prevail. But with respect to those institutions, it is of still greater importance to the people that discussion should be free. Such institutions as the rulers would improve, if they knew that they were defective, will be improved as the rulers themselves become sensible of their defects. Such defective institutions as the rulers would not wish to see improved, will never be improved, unless the knowledge of those defects is diffused among the people, and excites among them a disapprobation which the rulers do not think it prudent to disregard.

That the prevalence of true opinions among the people, relative to those defects in their political institutions, by which the rulers profit at their expense, is of the utmost importance to the people, is therefore a proposition which no improbity will dare openly to controvert. That freedom of discussion is the only security which the people can have for the prevalence of true opinions, has already been proved. It is therefore proved, that freedom of discussion, in its utmost perfection, they ought to enjoy.

What is included in the term, *freedom of discussion*, is evident from what has already been said.

Freedom of discussion means the power of presenting all opinions equally, relative to the subject of discussion; and of recommending them by any medium of persuasion which the author may think proper to employ. If any obstruction is given to the delivering of one sort of opinions,

Liberty of the Press. not given to the delivering of another; if any advantage is attached to the delivering of one sort of opinions, not attached to the delivery of another; so far equality of treatment is destroyed, and so far the freedom of discussion is infringed; so far truth is not left to the support of her own evidence; and so far, if the advantages are attached to the side of error, truth is deprived of her chance of prevailing.

To attach advantage to the delivering of one set of opinions, disadvantage to the delivering of another, is to make a choice. But we have already seen, that it is not safe for the people to let any body choose opinions for them. If it be said, that the people themselves might be the authors of this preference, what is this but to say, that the people can choose better before discussion than after; before they have obtained information than after it? No; if the people choose before discussion, before information, they cannot choose for themselves. They must follow blindly the impulse of certain individuals, who, therefore, choose for them. This is, therefore, a pretence, for the purpose of disguising the truth, and cheating the people of that choice, upon which all their security for good government depends.

If these deductions are as clear and incontrovertible as to us they appear to be, the inquiry respecting the principles which ought to regulate the use of the press is drawn pretty nearly to its close. We have shown that, as far as regards the violation of the rights of individuals, in respect to both persons and things, no definition on account of the press is required. We have shown in what manner the rights of individuals, in regard to reputation, should be defined by the civil code, and the violation of them prevented by the penal. We next proceeded to what may be considered as the main branch of the inquiry, namely, the use of the press in speaking of the institutions and functionaries of government. We have found that, in this respect, the freedom of the press is of such importance, that there is no security for good government without it. We have also found, that the use of it, in respect to those subjects, admits of but two useful restrictions, that of a direct exhortation to obstruct any of the operations of government in detail, and that of imputing to a functionary of government a criminal act, which there was no ground, nor even an appearance of ground, to impute to him. These restrictions, of course, it would be very easy to define in the criminal code, and to find appropriate motives to sanction. In all other respects, we have seen that the press ought to be free; that if there is any limit to the power of delivering unfavourable opinions respecting either the functionaries or the institutions of government, and of recommending those opinions by any media, with the single exception of false facts, under the circumstances mentioned above, the benefits which may be derived from the freedom of the press are so greatly infringed, that hardly any security for good government can remain.

IV.—LIMITATIONS TO FREEDOM OF DISCUSSION, WHICH INVOLVE ITS DESTRUCTION.

In the administration of English law, or rather of what is called law, upon this subject, without being any thing better than the arbitrary will of the judges, it is said, that though discussion should be free, it should be "decent;" and that all "indecent" in discussion should be punished as a libel. It is not our object in this discourse to give an exposition of the manifold deformities of the English law of libel. If we have been successful in developing the true principles which ought to regulate the freedom of the press, every reader may, by an application of those principles, determine what he ought to think of the several particulars which there may attract his attention. We shall

Liberty of the Press. confine ourselves to a short notice of those *dicta*, or doctrines, which seem most likely to be pleaded, in opposition to the principles which we have endeavoured to establish.

The question is, whether *indecent* discussion should be prohibited? To answer this question, we must, of course, inquire, what is meant by indecent.

In English libel law, where this term holds so distinguished a place, is it not defined?

English legislators have not hitherto been good at defining; and English lawyers have always vehemently condemned, and grossly abused it. The word "indecent," therefore, has always been a term under which it was not difficult, on each occasion, for the judge to include whatever he did not like. "Decent," and "what the judge likes," have been pretty nearly synonymous.

Indecency of discussion cannot mean the delivery either of true or of false opinions, because discussion implies both. In all discussion there is supposed at least two parties, one who affirms, and one who denies. One of them must be in the wrong.

The delivery, though not of all true opinions, yet of some, may be said to be indecent. All opinions are either favourable or unfavourable. True opinions that are favourable to government and its functionaries will not be said to be indecent; nor will all opinions that are true and unfavourable be marked out for prohibition under that name. Opinions unfavourable may either be greatly unfavourable or slightly unfavourable. If any unfavourable opinions are exempted from the charge of indecency, it must be those which are slightly so. But observe what would be the consequence of prohibiting, as indecent, those which are greatly unfavourable. A true opinion, greatly unfavourable to a functionary, or institution, of government, is an opinion that the functionary, or institution, is greatly hurtful to the people. You would permit the slight evil to be spoken of, and hence removed; you would not permit the great evil to be spoken of.

If no *true* opinion can be regarded as indecent, meaning by indecent, requiring *punishment*, we must inquire if any *false* opinion on matters of government ought to be treated as such. If all false opinions are indecent, all discussion is indecent. All false opinions, therefore, are not indecent. The English libel law does not treat any favourable opinions, how much soever false, as indecent. If all opinions that are false and unfavourable are said to be indecent, who is to judge if they are false? It has been already proved, that the people can confide the power of determining what opinions are true, what are false, to none but themselves. Nothing can resist the following argument. Either the people do know, or they do not know, that an opinion is false: if they do not know, they can permit nobody to judge for them, and must leave discussion its free course: if they do know, all infliction of evil for the delivery of an opinion which then can do no harm, would be purely mischievous and utterly absurd.

If all opinions, true and false, must be allowed to be delivered, so must all the media of proof. We need not examine minutely the truth of this inference, because it will probably be allowed. It will be said, however, that though all opinions may be delivered, and the grounds of them stated, it must be done in calm and gentle language. Vehement expressions, all words and phrases calculated to inflame, may justly be regarded as indecent, because they have a tendency rather to pervert than rectify the judgment.

To examine this proposition, it must be taken out of that state of vagueness in which so many things are left by the English law, and made, if possible, to speak a language, the meaning of which may be ascertained.

We have just decided, and, as it appeared, on very substantial grounds, that the statement of no opinion, favour-

Liberty of the Press. able or unfavourable, true or false, with its media of proof, ought to be forbidden. No language necessary for that purpose can be indecent, meaning here, as before, nothing by that term, as nothing can be meant, but simply *punishable*, or proper for punishment.

But the only difference between delivering an opinion one way and another way is, that in the one case it is simply delivered, in the other it is delivered with indications of passion. The meaning of the phrase in question then must be, that an opinion must not be delivered with indications of passion.

What! not even a favourable one?

"Oh, yes; a favourable one. Merited *praise* ought to be delivered with warmth."

Here, then, is inequality, and therefore mischief, at once. An opinion, meaning here a true opinion, if it is favourable, you allow, if unfavourable, you do not allow, to be delivered in a certain way. Why? Because in that way, you say, it is calculated to make an undue impression. Opinions favourable, then, you wish to make an undue impression, and by that confess the wickedness of your intention. You desire that the people should think better of the institutions and functionaries of their government than they deserve; in other words, you wish the government to be bad.

If opinions, to what degree soever unfavourable, may be freely and fully delivered, there are two conclusive reasons why the terms in which they are delivered should not be liable to punishment. In the first place, the difference between one mode of delivery and another is of little consequence. In the second place, you cannot forbid the delivery in one set of terms, without giving a power of preventing it in almost all.

First, the difference is of little consequence. If I say barely that such a functionary of government, or such an institution of government, is the cause of great injury and suffering to the people, all that I can do more by any language is, to give intimation, that the conduct of such functionary, or the existence of such institution, excites in me great contempt, or great anger, or great hatred, and ought to excite them in others. But if I put this in the way of a direct proposition, I may do so, because then it will be a naked statement with regard to a matter of fact, and cannot be forbidden, without overthrowing the whole of the doctrine which we have already established.

If, then, I give indication of certain sentiments of mine, and of my opinion of what ought to be the sentiments of others *explicitly*, I ought, you say, to be held innocent; if *implicitly*, guilty. Implicitly, or explicitly, that is the difference, and the whole of the difference. If I say, that such a judge, on such an occasion, took a bribe, and pronounced an unjust decision, which ruined a meritorious man and his family, this is a simple declaration of opinion, and ought not, according to the doctrine already established, to meet with the smallest obstruction. If I also state the matter of fact with regard to myself, that this action has excited in me great compassion for the injured family, and great anger and hatred against the author of their wrongs, this must be fully allowed. I must further be allowed to express freely my opinion, that this action ought to excite similar sentiments in other members of the community, and that the judge ought to receive an appropriate punishment. Much of all this, however, I may say in another manner. I may say it much more shortly by implication. Here, I may cry, is an act for the indignation of mankind. Here is a villain, who, invested with the most sacred of trusts, has prostituted it to the vilest of purposes. Why is he not an object of public execration? Why are not the vials of wrath already poured forth upon his odious head? All this means nothing, but that he has committed the act; that I hate him for it,

and commiserate the sufferers; that I think he ought to be punished; and that other people ought to feel as I do. It cannot be pretended, that between these two modes of expression, the difference, in point of real and ultimate effect, can be considerable. For a momentary warmth, the passionate language may have considerable power. The permanent opinion formed of the character of the man, as well as the punishment, which, under a tolerable administration of law, he can sustain, must depend wholly upon the real state of the facts; any peculiarity in the language in which the facts may have been originally announced soon loses its effect. If that language has expressed no more indignation than what was really due, it has done nothing more than what the knowledge of the facts themselves would have done. If it has expressed more indignation than what was due, the knowledge of the facts operates immediately to extinguish it, and, what is more, to excite an unfavourable opinion of him who had thus displayed his intemperance. No evil then is produced, or none but what is very slight and momentary. If there should be a short-lived excess of unfavourable feeling, we have next to consider what is the proper remedy. Punishment should never be applied where the end can be obtained by more desirable means. To desire any excess of unfavourable feeling, all that is necessary is to show the precise state of the facts, and the real amount of the evil which they import. All excess of feeling arises from imputing to the facts a greater efficacy in the way of evil than belongs to them. Correct this opinion, and the remedy is complete.

Secondly, you cannot forbid the use of passionate language, without giving a power of obstructing the use of censorial language altogether. The reason exists in the very nature of language. You cannot speak of moral acts in language which does not imply approbation and disapprobation. All such language may be termed *passionate language*. How can you point out a line where passionate language begins, dispassionate ends? The effect of words upon the mind depends upon the associations which we have with them. But no two men have the same associations with the same words. A word which may excite strains of emotion in one breast, will excite none in another. A word may appear to one man a passionate word, which does not appear so to another. Suppose the legislature were to say, that all censure, conveyed in *passionate language*, shall be punished, hardly could the vices of either the functionaries or the institutions of government be spoken of in any language which the judges might not condemn as *passionate language*, and which they would not have an interest, in league with other functionaries, to prohibit by their condemnation. The evil, therefore, which must of necessity be incurred by a power to punish language to which the name of *passionate* could be applied, would be immense. The evil which is incurred by leaving it exempt from punishment is too insignificant to allow that almost any thing should be risked for preventing it.

Religion, in some of its shapes, has, in most countries, been placed on the footing of an institution of the state. Ought the freedom of the press to be as complete, in regard to this, as we have seen that it ought to be, in regard to all other institutions of the state? If any one says that it ought not, it is incumbent upon him to show where, in the principles, which are applicable to the other institutions, fail in their application to this.

We have seen, that, in regard to all other institutions, it is unsafe for the people to permit any but themselves to choose opinions for them. Nothing can be more certain, than that it is unsafe for them to permit any but themselves to choose for them in religion.

If they part with the power of choosing their own reli-

Libourne gious opinions, they part with every power. It is well known with what ease religious opinions can be made to embrace everything upon which the unlimited power of rulers, and the utmost degradation of the people, depend. The doctrine of *passive obedience* and non-resistance was a *religious doctrine*. Permit any man, or any set of men, to say what shall, and what shall not, be religious opinions, you make them despotic immediately.

This is so obvious, that it requires neither illustration nor proof.

But if the people here, too, must choose opinions for themselves, discussion must have its course; the same propositions which we have proved to be true in regard to other institutions are true in regard to this; and no opinion ought to be impeded more than another by anything but the adduction of evidence on the opposite side. (J. M.—L.)

LIBOURNE (the ancient *Liburnum*), a town of France, capital of a cognominal arrondissement in the department of Gironde, on the right bank of the Dordogne, at the influx of the Isle, and on the Tours and Bordeaux Railway, 22 miles E.N.E. of the latter town. A handsome brick bridge of nine arches crosses the Dordogne, while the Isle is crossed by an iron suspension-bridge. Its port is tidal, and capable of receiving vessels of 300 tons. This is one of the *Bastides*, or free towns, founded by Edward I. of England, and is

remarkable for its neat and regular appearance. It is surrounded by walls affording agreeable promenades, and has extensive cavalry barracks. It is the seat of thousands of primary instance and commerce; and has a communal college, theatre, and public library of 5000 vols. The manufactures comprise cotton and woollen stuffs, rope, nails, leather, &c. Ship-building is also carried on. Its chief trade is in corn, salt, wine, and brandy. Pop. (1851) 11,552.

LIBRA. See WEIGHTS AND MEASURES.

LIBRARIES.

LIBRARY, in ordinary language, may mean either (1.) a collection of books, public or private; (2.) A building or apartment destined for the reception and systematic arrangement of such a collection; or (3.) a series of treatises on a particular subject,—as, for example, *Library of Anglo-Catholic Theology*,—or a series of works on various subjects, published on some uniform plan, such as *Murray's Family Library*, and the like. It is in the two former senses only that the term is employed in this article.

roused to the importance of supplying this deficiency in an effective and thorough manner.

In the formation of a library of this description, it will be well, we think, for the promoters to fix, at the outset, upon some particular class or classes of literature, in which it shall be pre-eminently well provided. What these chosen subjects shall be, must, of course, depend in each case upon special circumstances, which will be different in different places. But be these circumstances what they may, some one important class, at least, should be selected, in which the library shall have, as early as possible, a systematic collection, not a mere chance aggregation of books. In the instances of the Town Libraries which have been recently established, the largest sum available for purchases has not (under very favourable conditions) exceeded L.6000. Twice that sum would be utterly insufficient for the formation of a really valuable library upon *all* subjects, even if it were restricted to books in English. But a much smaller sum than L.6000, if appropriated on the principle of spending most of it in the purchase of books on some one leading subject,—say, for example, on British history,—and the remainder on the best and most indispensable books, only, on other subjects of general interest, will lay the foundation of a library, which, from the beginning, will tend as well to make students as to help them.

Another point which should receive careful attention, in the establishment of a library of this class, is the collection of works illustrative of the local history of the town and county in which it is placed. Many generations have elapsed since John Bale expressed² his earnest wish that in every shire of England there were "at least one library for the preservation of noble works and preferment of good learning." Had effect been given to that desire in his own day, many more of the choice treasures of the monastic libraries would have been saved from destruction, and much valuable material for local topography would have been accessible, which is now irrecoverably lost. In a Town Library, every thing of this kind which is procurable should be stored up for the future historian. Every book and every fugitive tract that bears on the history or antiquities, the fauna or flora, the trade or politics of the district; on the lives of local worthies, or on local affairs and institutions of whatever description, should be sought for and preserved. And whenever unprinted materials of this sort are known to exist in

(1.) OF THE COLLECTION OF BOOKS BY PURCHASE.

Collection
of books by
purchase.

In the formation of a Public Library, the first concern of the founders should obviously be to acquire a distinct conception of the aims with which it is established, and of the studies which it is intended principally to facilitate. To a great national library, indeed, all sorts and varieties of books are welcome; but a library of this kind is rather a growth than a formation. The chief libraries of a country ought, unquestionably, to be encyclopædical, because even the "trash" of one generation becomes the highly-prized treasure of another. What a Bodley, at the end of the sixteenth century, calls "riff-raff, . . . which a library-keeper should disdain to seek out to deliver to any man,"¹ a Bodley's librarian has to buy almost for its weight in gold at the beginning of the nineteenth century. For, by that time, it comes to be apparent that the most obscure pamphlet, or the flimsiest ballad, may throw a ray of light upon some pregnant fact of history, or may serve as the key to a mystery in some life-career which gave to an age its very "form and presure."

But, besides these great repositories, many libraries are needed of narrower aims and of more specific character. Of these, some are professional, such as—Law Libraries, Divinity Libraries, Medical Libraries, and the like. In collections of this kind, no country, perhaps, is richer than our own; and for the formation of new ones, wherever they may be needed, many and excellent appliances lie ready to the hand. Far more difficult will be the labour of planning, advisedly and with clear forecast, those public, provincial, and town libraries in which the United Kingdom has hitherto confessedly been very deficient. The steps which have recently been taken, under Mr Ewart's Libraries Act, are proofs that public attention is now fairly

¹ Letter to Thomas James, printed in *Reliquiæ Bodleianæ* (1703), 278.

² In his preface to Leland's *New Year's Gift to King Henry VIII.*

Collection
of books by
purchase.

other libraries or repositories, public or private, transcripts should be obtained, so that the Town Library may become the head-quarters for all seekers into the town history.

If the fund to be expended in book-buying is large, it will be good economy to make, at the outset, a collection of bibliographical works and of catalogues. The learned Gabriel Naudé indicated the advantage of this course two centuries ago (in his curious *Avis pour dresser une Bibliothèque*); and his remark still holds good, that "by this means one may also do a friend service and pleasure, and when we cannot furnish him with the book he is in search of, direct him to the place where he may find a copy." It will also, in many cases, be good economy to draw up and to print, for circulation amongst booksellers, lists of the principal books sought for, and these may be so framed as to serve for a time by way of provisional catalogues. In the search after the best editions of our standard writers, their critics, commentators, and assailants should not be forgotten. Subsidiary works of this kind are often of very troublesome quest; but they are valuable, if not for the light they throw upon their object, at least for that which they reflect upon their age. The silliest commentator on Shakspeare, however little he may illustrate his author, will sometimes afford a very useful illustration of the history of manners, or of the growth of opinion. Whether works which exist both in separate editions and in "collections"—such as, the *Bibliotheca Patrum*, or the *Rerum Anglicarum Scriptores*—shall be purchased only in the one form or in the other; or whether both collections and separate editions shall be sought for, when the latter possess any special claims to attention,—is another question which lies on the threshold of book-collecting for a large library. In general, it may be suggested, that all the great collections which come within the scope of the library to be formed, together with the best Encyclopædias, Lexicons, and Dictionaries of all kinds, should be amongst the earliest purchases. The Transactions of the chief learned societies, and the long sets of important periodicals, should also receive early attention. Books of this description form the true foundation and framework of a library; in addition to their more direct uses, they may render useful help in its subsequent enlargement, and, if neglected at first, there is usually little likelihood that they will be properly cared for at a later period.

In a National Library it will be praiseworthy to bestow pains on the collection of pamphlets, and of the other ephemera of literature; and if the prevailing character even of a provincial or special library be historical, "old tracts" will need to occupy much of the librarian's attention, and not a little space on the shelves. The causes that make them important are often those that make it difficult to obtain them when required.

Collection
of books by
legal exaction.

(2.) OF THE COLLECTION OF BOOKS BY LEGAL EXACTION.

The exaction, by legal enactment, of copies of books for deposit in public libraries is both ancient and general. It obtains in the freest and in the most despotically governed countries. But in the former it is usually the relic of a state of things which has almost passed away, and in the latter it seems racy of the soil. Everywhere it is, or it has been, connected with a censorship of the press. In France, the Imperial Library at Paris, and that only, is entitled to a copy of every work published within the empire.¹ In Belgium and in the Netherlands the deposit of copies is not compulsory in all cases, but is the necessary condition of copyright. In Sardinia the Library of the University of

Collection
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legal exaction.

Turin is entitled to a copy of every book printed within the kingdom. In Tuscany every public library enjoys a similar right as respects books printed within the city, and the prefecture, in which it is placed. By the law of Sicily, the University Library at Palermo is entitled to a copy of every book printed in that city; and by that of Naples, four copies of every book printed in the capital must be delivered, two for the *Borbonica*, one for the *Brancacciana*, and one for the University Library. In Rome the printers are enjoined to send five copies to the Master of the Sacred Palace, who is to keep one in his office, to deliver one to the vicar-general, one to the Vatican Library, another to one or other of two libraries—the Gymnasium or the "Sapienza"—and the remaining copy he is to return to the author. In other parts of the Papal States the practice appears to vary, and the right, where it exists, to be almost inoperative.

By the law of Spain, the National Library at Madrid, as respects the whole kingdom, and the provincial libraries, within the respective provinces, have a right to copies. In Portugal, the National Library at Lisbon,² and the Town Library of Oporto, are each entitled to a copy of every book printed within the kingdom. If we turn to Germany, we find similar enactments to be almost universal, with more or less of modification. The Royal Library at Munich is entitled to two copies of all books printed in Bavaria. The Royal Library at Hanover, and the Library of the University of Göttingen, are each entitled to a copy of every book printed within the Hanoverian kingdom. In the Hanse towns a similar privilege is enjoyed by the town libraries of Hamburg and of Lubeck, but not by that of Bremen. By the law of Hesse-Cassel, two libraries, and by that of Hesse-Darmstadt, three libraries, are absolutely entitled to copies of all books published within the electorate or the duchy, respectively. The library at Fulda, in Electoral Hesse, appears to possess this privilege only with respect to books the copyright of which is secured. In Prussia the Royal Library at Berlin is entitled to a copy of every work published throughout the kingdom, whilst the University Libraries have a similar right within their respective provinces.

In Saxony a practice obtains which is different from all the usages hitherto noticed. The printer or publisher of every book is bound to deliver one copy to the appointed officer, whose duty it is to distribute the books, according to their subject and character, between the Royal Library at Dresden and the University Library at Leipzig. In Switzerland, the Geneva library alone has the copy privilege. At Berne it ceased in 1830. At Zurich it is matter of choice and custom with the publishers, but is not compulsory. By the laws of Denmark, the Royal Library of Copenhagen is entitled to two copies of all books published in the Danish possessions. The three principal libraries of Sweden (at Stockholm, Upsal, and Lund), have each a right to one copy of every work printed in Sweden; but this right does not extend to Norway. In Russia, the Imperial Library of St Petersburg is entitled to two copies of every work published within the empire.

By an act of the congress of the United States of America (31st May 1790), which has been continued and extended by subsequent acts, one copy of every work in which a copyright is secured must be deposited in the state department at Washington.³ There the books remain, and are publicly accessible, under certain regulations. At present they are said to amount to about 10,000 volumes; and the average annual increase appears to be about 400 volumes.

¹ Returns relating to Foreign Libraries, procured through the Foreign Office, and printed in the Commons' Sessional Papers of 1850, 1851, and 1852. These are the authorities for all the statements relating to the exaction of copies by foreign legislation, unless it be otherwise indicated.

² Castilho Barreto e Noronha, *Relatorio a'cerca da Bibliotheca Nacional de Lisboa* (1844), i. 28.

³ Jewett, *Notices of Public Libraries in the United States of America* (1851), 140.

Collection
of books by
legal ex-
action.

In England, as early as the year 1609, Sir Thomas Bodley made an agreement with the Company of Stationers, by which it was provided that one copy of every book which they should print thenceforward was to be given to the Bodleian Library, and it appears that this agreement was fairly observed until the breaking out of the civil wars.¹ Long before Bodley's day copies had been exacted for delivery to the licensers of the press; but the first parliamentary enactment by which printers were enjoined to give copies to libraries was that contained in the Sedition Act, 14th Charles II., c. 33. Three copies were to be delivered at Stationers' Hall, one of which was to be sent to his Majesty's Library, and the others to the two universities. By the famous Copyright Act of the 8th of Queen Anne, the exacted copies were increased to *nine*, and by the 41st George III., c. 107 (passed after the Irish Union), to *eleven*. This last-named enactment continued to be in force until 1835. The appropriation of the eleven copies was as follows:—1. Royal Library (*British Museum*). 2. *University Library at Cambridge*. 3. *Bodleian Library at Oxford*. 4. University Library, Edinburgh. 5. University Library, Glasgow. 6. King's College Library, Aberdeen. 7. University Library, St Andrews. 8. Sion College Library, London. 9. *Advocates' Library, Edinburgh*. 10. *Trinity College Library, Dublin*. 11. King's Inns Library, Dublin.

By the 5th and 6th William IV., c. 110, this privilege was abolished, as respects six of the eleven libraries above-named; and a yearly grant of L.3028 was charged upon the Consolidated Fund by way of compensation, to be distributed as follows:—

To the Library of the University of Edinburgh	L.575
... .. University of Glasgow	707
... .. University of St Andrews	630
... .. King's College, Aberdeen	320
... .. Sion College, London	363
... .. King's Inns, Dublin	433

The grant was thus apportioned in accordance with an estimate of the annual value of the books which each library had actually received, on an average of a certain number of years prior to the passing of the act. Thus, the privilege having been enforced with far greater strictness at Glasgow than at Aberdeen, the former university receives more than twice the yearly sum assigned to the latter. As the law now stands, the copy of every book due to the British Museum must be there delivered, irrespectively of any demand. The other four copies are due only after demand, in writing, within twelve months of publication. (54th Geo. III., c. 156.)

The copy-exaction, even within its present limits, has always been obnoxious to the great majority of the publishers, and to no small number of the authors, who have been chiefly affected by it. Those, especially, whether authors or publishers, who own the copyright of such illustrated books as are both extensive and costly, have found the exaction to be oppressive. The popular notion, that this is a tax which falls on the consumer and not on the producer (whatever the force of so questionable an argument), is a fallacious one, although it has been repeatedly put forward under various forms. It is, in truth, a tax which seriously enhances the cost of producing precisely such books as it is most clearly the public interest to facilitate, rather than to impede, and which takes out of the market precisely those customers of whose presence there the producers ought to be most secure. Wealthy universities and prosperous guilds would figure far more appropriately in the list of subscribers to the *Flora Antarctica*, or the *History of Leicestershire*, or the *Birds of Europe*, than in the warehouse-

Collection of books by legal exaction.

book of the Stationers' Company as leviers of literary blackmail. The entire system, indeed, of exacting books without payment, belongs to the period when brain products were at the mercy of every plunderer, and copyright was a passing protection, accorded rather as a concession than as a right.

It is not surprising, therefore, that the law on this point has been largely evaded. Up to the present time, the Library of the British Museum is the only one in whose favour it has been thoroughly carried out; and even there it is only during a very few years that it has been so carried out. In 1854 the total number of books, pamphlets, &c., actually received amounted to 19,578. In order to produce this result, great vigilance and some severity have been needed. But so long as the law remains on the statute-book, it ought unquestionably to be strictly enforced.

At Cambridge, during the seven years from 1844 to 1850 inclusive, the total number of books, parts of books, pieces of music, &c., received by the University Library, was 52,348, or, on the average, 7478 yearly. The number for the single year 1850 was 7830.² At Dublin, during the same seven years, the total number received was 21,260, or, on the average, 3037 yearly. The number for the single year 1850 was 3454. The disproportion between the receipts at Dublin and those at Cambridge is very great; Yet it was given in evidence, on the part of both universities, that agents are employed in London, with instructions to claim every book that is published. Both returns also profess to give the number of articles, not of volumes, that are received.

In addition to the objection which, as it seems to us, may fairly be taken to the principle that underlies the enactment in question, there is another, and a grave one, which applies to the mode of using it, as respects the great majority of the participating libraries. Were all these institutions open to the public as matter of right, not of favour, the public would receive some return for the exaction, though an indirect and an insufficient one. It would still be matter of reasonable complaint that a part of the community is taxed for the benefit of the whole community. It would still be true that a national advantage ought to be paid for out of the national purse. But the Libraries of the Universities of Oxford, Cambridge, and Dublin, are *not* national libraries. Of the whole number under both categories, the British Museum Library is the only one to which admission is matter of clear public right, although, in practice, the regulations of the Library of the Faculty of Advocates, Edinburgh, and those of the Library of Trinity College, Dublin, are liberally construed. If the three University Libraries, and the Advocates' Library, should continue to possess a claim to every book published, reasonable compensation should be made to the publishers, at the public charge. Those libraries should be put on as good footing for its enforcement as that enjoyed by the British Museum. All the privileged libraries should be made accessible, without favour, under known rules. All should be bound to *publish*, in due concert, an accurate and full descriptive list of every publication which they have received. The literary community would thus obtain a better "Publishers' Circular" than has yet existed.

(3.) OF THE COLLECTION OF BOOKS BY DONATION.

Although nothing is more certain than that those who love books are usually very chary of parting with them, yet in all the great libraries we find a considerable number of volumes which have been acquired, sometimes by gift, but more frequently by bequest. Of the 562,000 volumes which are now in the British Museum, no less than

Collection of books by donation.

¹ Dr Hudson's account of the Bodleian, printed in Macky's *Journey through England* (1722), 71 et seqq.

² Report, &c., of Cambridge University Commission (1852), 55, 56.

Collection
of books by
donation.

220,000 have been either presented or bequeathed. But even this goodly number would, in all probability, have been greatly increased, if, some forty years ago, there had been less narrowness of view as to the necessary qualifications for what some have called the "blue ribbon of literature"—a trusteeship. This was the great object of ambition, both to Richard Gough, the author of the *Sepulchral Monuments of Great Britain*, and to Francis Douce, the author of the *Illustrations of Shakspeare*. Both of them had made valuable additions to English literature; both of them possessed fine libraries, especially rich in British topography and history; but neither of them was either a peer or a placeman. Both fortunately bequeathed their libraries to the University of Oxford, where they are worthily lodged; but of their comparative usefulness to the public, as they are, and as they might have been, not a word need be said. Since those days, it has happily become apparent, even to the official mind, that the dignity of the trusteeship is not diminished by being shared with a distinguished geologist or a great historian; and the list is now graced by the names of Murchison, Buckland, Hallam, and Macaulay, as well as by those of dukes and chancellors.

Worthy Bishop Huet, in his amusing *Commentaries*, has told us, in pathetic terms, of the regret with which he saw the fine library of the President de Thou disposed of in bulk (notwithstanding the pains with which the illustrious owner had entailed it as an heir-loom); but when, at a later period, it was sold in detail, part of it, he adds, "came into my possession; and . . . from this example I was led to be sensible of the certain destruction that awaited my library, unless I should make careful provision for preventing it. Having long and attentively revolved this in my mind, it appeared to me the best plan for keeping it entire, in perpetuity, to present it to some stable society of persons bound to the rules of a religious life."¹ Of all "stable" societies, the good bishop, as the result of his long wanderings, fixed on the Jesuits, and his "perpetuity" proved to be less than a century, although a portion of his collection and the good fortune to be subsequently incorporated (as a portion of the noble library of De Thou had previously been) with the Imperial Library of France.

Sometimes accident and caprice, at others shrewd observation and insight, will determine the fate of collections, as far as human arrangements can determine anything; but it is obvious that those libraries will be likeliest to have a good share of such acquisitions as combine evident care of the books they already possess with a wise liberality in their arrangements for access and profitable use.

There is, however, a class of books—both important and numerous—with the appropriation of which accident and caprice should never have anything to do; those, we mean, which have been printed at the national expense. Yet usually, in this country, the distribution of these books has been pre-eminently capricious. They are under the control of various departments and functionaries. Intelligible rules have rarely been laid down for disposing of them, notwithstanding that the cost of their production to the country is very considerable; and when there has been the semblance of such, they have rarely been adhered to.

Amongst the works thus produced, which are especially valuable in libraries, may be mentioned, the collections of public documents, and of historical materials (such as the *State Papers of the reign of Henry VIII.*, and the *Monumenta Historica Britannica*); narratives of Voyages of Discovery, and Reports of the naturalists, and other scientific officers connected with them; Collections of Astronomical Observations; and, generally, the various publica-

tions connected with the Ordnance Surveys, and the Geological Survey of the United Kingdom. Some of these publications are under the control of the Home-Secretary, others under that of the Board of Admiralty, and the Board of Ordnance. As respects none of them have systematic rules of distribution been adopted; and it would be easy, but can scarcely be necessary, to cite instances of the capricious absurdity with which they are sometimes granted to one library, and refused to another, under circumstances precisely similar.

The Reports and Papers of both Houses of Parliament are also most important acquisitions for public libraries. The select committee on the subject of the dissemination of those of the House of Commons, appointed in 1853,—to preside over which, with self-denying perseverance, under all the discouragement of failing health, was the last service of a true public servant, the late Henry Tufnell,—strongly recommended a *free* distribution of these documents to all libraries which united the two conditions of secured permanency and unrestricted accessibility; but the recommendation has yet to be carried out. No objection to it has been advanced which is not a proven fallacy, and the measure needs only to be taken up by a vigorous hand in order to its proper settlement.

(4.) OF THE COLLECTION OF BOOKS BY INTERNATIONAL EXCHANGE.

Collection
of books by
international
exchange.

Occasional, and sometimes munificent, exchanges of the literary and scientific productions of different countries are by no means of recent origin, but until very lately they have been accidental rather than systematic; and our own country has been a laggard in their encouragement. There is a Treasury minute of 1832, in which "the Chancellor of the Exchequer informs the board that there is the prospect of an arrangement being made . . . with the government of the King of the French, by which an interchange of all new literary publications will be secured for the use of the library of the British Museum in the one country, and the Bibliotheque du Roi in the other."² But the "prospect" has remained a prospect, except only as regards the very useful interchange of public documents between the libraries of the respective legislatures. It appears to have been about this time that the attention of Mr Alexander Vattemare was attracted to the subject of international exchanges of books, and there is abundant evidence that he has given important help in a good work. In 1853 Mr Vattemare addressed to the "convention of librarians," which met in New York, a report, in which he enumerated upwards of 130 public libraries and other establishments which had "participated in the benefits of the system of exchanges;" and stated that in this way no less than 61,000 books and pamphlets had been distributed, during five years, by his agency, in the United States and in Europe.³ Two years later, the Regents of the University of the state of New York, in presenting to the legislature their annual report for 1855, as trustees of the State Library, spoke in high terms of commendation of the results in that state of Mr Vattemare's exertions.⁴

A similar agency, on a much larger and rapidly increasing scale, has been recently established by the Smithsonian Institution at Washington. On this head it is stated, in the eighth annual report (1854), that "the institution is now the principal agent of scientific and literary communication between the Old World and the New. Its system of exchange is established on a reliable basis, namely, that of the publications of the institution itself. . . . The importance of such a system, with reference to the scientific

¹ Huet's *Commentaries*, translated by Aikin, ii., 355-358.

² Treasury Minute, July 1832, presented to the House of Commons.

³ *New York Literary Register* (1854), 87-93.

⁴ *Report of the Trustees of the State Library of New York* (1855), 6.

Construction, &c., of public libraries.

character of our country, could scarcely be appreciated by those who are not familiar with the results which flow from an easy and certain intercommunication of this kind.¹

(5.) THE CONSTRUCTION AND FURNISHING OF BUILDINGS FOR THE RECEPTION OF PUBLIC LIBRARIES.

The first difficulty which a committee, charged with such a duty, has usually to grapple with is, to reconcile the frequently conflicting claims of *site* and of *form*. A public library, and above all a Town Library, needs a site as central as can be obtained. Any library which is to be adequately kept up should be of such form as shall admit of easy and considerable enlargement, without entailing the necessity of re-arranging the existing contents. Either a cruciform, a polygonal, or a circular building will, more or less, meet these requirements, provided always, that additional space has been preserved to meet the contingency of extension, or can be readily obtained. But this is precisely the condition which it is most difficult to secure in the centre of a town. When one or the other of these advantages must be foregone, it will often, we think, be good economy to make some sacrifice in site rather than forego the benefit of an easily expandible *plan*. The circular, or polygonal, plan is best of all, because the most favourable to completeness and permanency of arrangement, in union with gradual and indefinite extension; and it is quite certain that no inconvenience of position will prevent a public library from being well frequented, if it be rich in books, and liberal in its regulations. This premised, we proceed to suggest other considerations which should be borne in mind in planning a library which is to be permanent, and for which adequate funds are at hand.

1. The site must be dry and airy; the building (whatever its form) isolated; and, if placed in a great thoroughfare, it should be set back as much as possible.

2. The building should be fire-proof. To this end, other materials than brick, stone, iron, and slate, should be very sparingly admitted into its main structure. Such timber floors as may be used in any special apartments should be embedded in stucco, upon a stone flagging, or upon brick arches.

3. The ground-floor should be vaulted, and in all the external walls there should be ample apertures and channels for ventilation. If the building be extensive, large water-pipes (fire-mains) should be carried along the roof.

4. Whenever practicable, light should be obtainable from all sides, but should be provided, as much as possible, from cupolas, or lantern-lights, which obviously favour the appropriation of the largest amount of wall-surface for book-shelves within a given area.

5. The principal rooms destined for the reception of books should be of such proportions, and be so constructed, as to admit of the greatest possible proportion of the contents being seen at one view. Every shelf should be accessible without the use of steps or ladders. By providing light galleries of perforated iron, with breast-high railings and with spiral staircases at each angle of the room, this advantage may be secured even in the loftiest rooms. If, for example, the library be 35 feet high in the clear, four tiers of galleries, placed at intervals of about 7 feet, would admit of every book being instantly accessible without any loss of space.

6. The reading-room should invariably be separate from the rooms appropriated to the main collection of books; but it should be as much in the *centre* of the building as possible, and should be shelved for the reception of books of common reference (especially of such as form what may be fitly termed the bibliographical apparatus of a library). One or more smaller and adjacent rooms should be assigned for the use of such readers as need special facilities for collation, copying, and other like pursuits. The reading-rooms should be provided with a series of shelved closets, for the reception of books which are in continuous use from day to day. Such shelves may be lettered alphabetically, and the books placed according to the names of the readers who retain them, as has long been the practice in the British Museum.

7. There must be an ample provision of work-rooms contiguous to, but distinct from, the rooms appropriated to books and those

appropriated to the readers. In any extensive library the following separate rooms will be found essential to the thorough working and good order of the establishment:—(1.) A receiving and unpacking room. This should have a separate entrance. (2.) A stamping and registering room. (3.) A cataloguing and account-keeping room. (4.) A book-binding room. If the binding be done within the library building, this room should, of course, communicate with the workshop; but if otherwise, there should still be a small separate room devoted to the business connected with the binding. (5.) A board-room, or "committee-room." (6.) A librarian's room, which, in a large library, should have its waiting-room attached. (7.) Rooms for assistant librarians, &c., according to the extent of the establishment. (8.) Cloak-rooms, lavatories, &c., in similar proportion. In a great library, an ante-room, so placed as to afford convenience for the necessary and thorough cleansing of the books from time to time, will also repay its cost. Even in a small library, the provision of good and ample work-rooms will be found to be true economy in the long run. If the regulations of a library, whatever its extent, prescribe residence within the walls to a librarian or other officer, his apartments should be isolated from the main building.

8. It may now be assumed as a settled point, that a library of any size may be safely warmed either by open fire-places² properly constructed, or by hot-water pipes carried throughout the building. If the former are used, there are ample means and appliances for ensuring their security. If the latter, they should be placed in grated channels provided in the fire-proof floors, at a distance of at least 3 feet from the nearest books. Other pipes should be carried round or near to the lantern-lights and other extensive glazed surfaces. The boiler-house should be separate from the library building, and the circulation of the heated water should be unintermittent.

9. It may also be taken to be another point which experience has demonstrated, that gas may, with perfect safety, be introduced into a properly constructed library. The gas-fittings should always include tubes for carrying off from the burners the vapours produced by its combustion. The inner tube may be of copper, and the outer one of opaque glass; and these tubes may, with equal facility, be made pendant from the ceilings, or projecting from the walls; or, on the other hand, the lights may all be placed outside of the building,—a method which may be seen in very successful operation at University College, London, and elsewhere.

10. Book-presses may be made either of wood, as is usual, or the shelves may be of enamelled slate, and the backs and uprights of galvanized and perforated rolled iron. Whatever the material, the shelves should always be moveable, so that they may easily be adjusted to books of any size. The cases should be perfectly plain and smooth within, having neither projecting ornament near the shelves, nor any cavity at the sides. The lowest shelf should be at least 6 inches above the level of the floor, and there should be a clear space between the backs of the cases and the walls against which they stand. It will also be a good plan to make all the presses and their several parts of uniform dimensions, so that they may be transferable and interchangeable if necessary. All shelves intended for choice books should be covered with padded leather. Glazed table-cases, with sloping frames, should be provided for the exhibition of rare and curious books, autographs, and the other select treasures of a library.

11. For books of unusually large dimensions, either special shelves, on which they can lie flat, or "trays" constructed in the table-cases, should be fitted up. In a great library, other table-cases or tables should be fitted up with similar "trays," or with drawers in tiers, for the preservation and due arrangement of the catalogue titles or slips.

12. Reading-rooms should be provided with a special desk for catalogues, large enough to contain several sets, and with a good supply of reading-frames of various sizes. The use of these protects books of large dimensions from injury, as much as it promotes the convenience of readers. A very good form of reading-table and frame conjoined has recently been patented in the United States, by Mr Folsom of Boston, and will be found figured in the *New York Literary Gazette* of 1st June 1854. It is especially suitable for holding books of prints. Book-barrows or trucks, the tops and end rails of which should be covered with padded leather, are also very serviceable in a library.

(6.) OF THE PLAN AND PREPARATION OF CATALOGUES. Plan and preparation of catalogues.

An accurate catalogue of some sort, well kept up, is a

¹ *Eighth Report of the Regents of the Smithsonian Institution* (1854), 37–50.

² See the valuable evidence given by Mr Braidwood, superintendent of the London Fire Brigade, before the Commons Committee on the New Record Offices.

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of
catalogues.

cardinal point in the good management of a library. The question, *on what plan* the catalogue should be made, is not a very momentous one; yet very few questions of a literary kind have given rise to so many varieties of opinion. Few, it may be added, have been discussed more elaborately and sedulously by those who have striven to master them, or more flippantly by those who have been content to skim their surface.

The catalogues of public libraries have usually been either alphabetical or classed. Each plan has its special advantages and disadvantages. If the alphabetical arrangement be adopted, the cataloguer has to choose between an alphabet of authors and an alphabet of subjects. The first has the merit of being easy of construction, familiar in use, and eminently serviceable to all such readers as want the known books of known authors. But here its merit ends. For a reader who is in quest of *all* the books, known or unknown, avowed or anonymous, which the library contains upon a given subject, or section of a subject, a catalogue according to authors' names is almost useless. It may, indeed, lead him to all the works with which he is already more or less acquainted, but will do this only after a great expenditure of time and toil in searching volume after volume throughout the alphabet. In a great library this expenditure will be trebled, if (as has been too commonly the case) the names of authors are mixed pell-mell with the headings of anonymous books in a single alphabet. There are subjects on which the best books extant are anonymous. It is probable that every great national library contains more works without authors' names than with them. Of these anonymous books, a considerable proportion will doubtless belong to authors whose names are either known to, or conjectured, more or less plausibly, by, the learned bibliographer. But if conjecture be allowed to govern the *place* of a book in a catalogue, all reliability on it ceases.

If, on the other hand, an alphabetical arrangement according to the subject-matter of books be preferred, it becomes much easier to deal with the anonymous works. It is certain, also, that a large number of useful references are thus put at a glance before the student; and the plan exacts no previous acquaintance with systems of classification. But these merits have to be weighed against grave defects. Of necessity, such catalogues must deal rather with the phraseology of title-pages than with the real subject-matter of books, and must therefore fail to bring under one view all, or any near approximation to all, the books which the library contains on a given topic. In some cases, one word will have several distinct significations, and then the reader's search is obstructed by matter foreign to his purpose; in others, a subject is expressible by several synonymous, or at least convertible terms, and then all these must be turned to before he can be certain that he has the information of which he is in quest.

The schemes of classification which have been at various times propounded are multitudinous. No author has attempted to describe them all. Collections, however, more or less extensive, have been made by Peignot (*Dictionnaire raisonné de Bibliologie*, 1802); by Achard (*Cours Élémentaire de Bibliographie*, 1806); by Mr Hartwell Horne (*Outlines for the Classification of a Library*, 1825); by Sir John William Lubbock (*Remarks on the Classification of Human Knowledge*, 1834); by Brunet (*Manuel du Libraire*, 4ème édition, 1845, *Introduction*); and by M. Albert (*Recherches sur les Principes Fondamentaux de la Classification Bibliographique*, 1847).

All the schemes which have been propounded, from Gesner's day down to our own, may be gathered into one or other of two groups, by far the largest of which, whatever its other merits, is essentially unsuited to the business of a library. The schemes which belong to the first group aim

at a systematic and consecutive arrangement of all human knowledge, in accordance with some theory, either of the powers and functions of the mind itself, or of the order and succession in which the phenomena of the material world may be conceived to present themselves to its contemplation. The schemes which belong to the second group, with far humbler pretensions, seek but to sort, after some handy and convenient fashion, the instruments of knowledge for daily use. In the former case the system-maker aspires to solve some of the knottiest problems which have ever puzzled metaphysicians. In the latter case, he is content if he be found to have facilitated the buying and selling, the shelving and finding of books, by all who handle them.

At the head of the second group, Gabriel Naudé has, perhaps, the best claim to stand. The general character of his scheme is indicated in the *Avis pour dresser une Bibliothèque*, which he published in 1627, although it was first developed in the *Bibliotheca Cordesiana*, which did not appear until 1643. Naudé deserves the credit of having been a pioneer in the right path; but the real originator of the system which has the fairest claim to be styled a bibliographical one, was Ismael Bouillaud, the compiler of the Catalogue of the Library of De Thou. Bouillaud's Catalogue was not published until 1679, a year after the appearance of the elaborate *Système Bibliotheca Collegii Parisiensis Societatis Jesu* of Father Garnier; but it had been written several years before it was published, under the editorial care of Quesnel. Bouillaud makes no display of his ingenuity, by adding new classes to those of his predecessors, nor of his erudition, by coining far-fetched and sonorous names for the old ones; but he lays a firm grasp on five comprehensive classes:—I. *Theology*; II. *Jurisprudence*; III. *History*; IV. *Philosophy*; V. *Literature*; and brings all the books with which he had to deal under one or other of these main divisions. This scheme has the advantages of simplicity, facility, and expansibility. All its main classes, with the exception of *Philosophy*, possess well defined limits. All may be adjusted, by modifications of mere detail, to the extent and character of the particular library to which they have to be applied. It was to be expected, therefore, that the plan would win the favour, not only of librarians, but of men who were at once eminent booksellers and eminent bibliographers, such as Marchand, Gabriel Martin, Debure, and Brunet. Each of these men improved some or other of its details. Most of them agreed in substituting the class *Sciences* and *Arts* for the class *Philosophy*, and in employing the latter term as a subdivision of the former. The class *History*, too, was usually made fifth in order, instead of being third. But the substance of the scheme remained unaltered; and, in course of time, it came to be embodied in an unrivalled series of catalogues, which are classics in their kind.

In this country the Paris system is best known in the form which Mr Hartwell Horne gave to it when cataloguing the fine library of Queen's College, Cambridge; and when preparing his *Outlines for the Classification of a Library*, which were submitted to the trustees of the British Museum in 1825. Mr Horne's modifications are bolder than most of those which have been adopted by French bibliographers, and some of them possess unquestionable merit. Four out of the five principal classes he leaves intact. The class *Sciences* and *Arts* he breaks up into two, the first of which he designates *Philosophy*, and the second *Arts and Trades*. The six classes thus formed he ranks in the following order:—I. *Theology or Religion*; II. *Jurisprudence*; III. *Philosophy*; IV. *Arts and Trades*; V. *History*; VI. *Literature*. In the subdivisions he introduces several changes. He removes the section "History of Religions" from the class *History*, and places it in *Theology*; and, in like manner, transfers the "History of Literature" from the class *History* to the class *Literature*. The vast and rapidly in-

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(7.) OF THE INTERNAL REGULATION AND FINANCIAL ECONOMY OF LIBRARIES.

Before they are placed on the shelves, the books of a public library need not only to be catalogued, but to be stamped and press-marked. The best mode of stamping books is by an embossing-press; and the stamp should be applied to every plate and every map, as well as to the title-page and the first and last leaves of the volume. The press-mark, or symbol, which indicates the place of a book on the shelves, should appear both on the outside and inside of every volume. If lettered on the binding itself, it is almost indelible, and thus involves extra trouble and cost, in the event of a re-arrangement of the books; but this plan has greatly the advantage in point of appearance, and if care be used, the proportion of books which may need removal will be very small. In libraries of no great extent, progressive numbers are commonly used; in large libraries it is more usual to give numbers to the several presses, letters to the shelves, and numbers again to the volumes on each shelf. Thus 18 D. 12 will denote the 12th book on the fourth shelf of press 18. There is no necessity to class books on the shelves with the minuteness of detail which is requisite for a good catalogue, but the main divisions of the catalogue should be carried out in the practical arrangement. And by allotting each class a *surplus* number of presses, provision may be made beforehand for considerable additions, in continuous order, without either interrupting the succession of the classes, altering the press-marks of the books already catalogued, or resorting to the unsightly expedient of intermingling empty shelves with full ones. Thus, for instance, if the order of the classes be that adopted by Mr Hartwell Horne, and there be in the library enough books in the class "Theology" to fill, say twenty-five presses, the books in "Jurisprudence" may begin in the twenty-sixth press, but that press may be numbered "51," instead of "26." The books *added* to the class "Theology" will, of course, belong to "press 26," and may be placed in any part of the library until they have amounted to an entire pressfull.

Experience has shown that the rapid service of readers may be greatly promoted by requiring that the demand for a book shall be written, not verbal, and that the reader, in ordinary cases, shall be expected to look in the catalogue, and copy from it the press-mark of the book he applies for. Another means of facilitating the supply of books to readers, is to affix to every press in the library a brief synopsis of its contents. If a reader requires the 120th volume of a long set, to give its precise press-mark would be exacting an idle waste of time. By placing a "tablet" to each press, an attendant may light on any such volume in a moment.

Those in use in the Manchester Free Library, are printed and varnished, and are placed breast-high in front of each press.

An accurate system of registration and book-keeping is of the first importance to the good working of a public library. The following may be regarded as among the appliances of this kind which are indispensable. In many libraries others will be necessary for special purposes. The account-keeping, which belongs to a *lending* library, in particular, will be referred to hereafter:—

1. An *Accession Catalogue*, or Register, indicating the date of each acquisition, and how it was acquired.
2. A *Donation-Book*, for more ample descriptions of all gifts than are needed in the Register, in which the briefest indication will suffice.
3. A *Shelf Catalogue*, in which every book is entered in the shortest form, press by press, and shelf by shelf. This catalogue should be so prepared as to admit of its being used in the way of "stock-taking" from time to time.
4. A *Binding-Book* for entry of all books delivered to the binder, and for the due chequing of their return.
5. A *Report-Book* for entering the daily returns of issues to readers. These issues should be classed in the order which is used in the general arrangement of the library.
6. A *Suggestion-Book* for the insertion by readers of books deemed desirable for addition to the library.
7. A *Ledger and Cash-Book* of the ordinary mercantile kind, for receipts and disbursements.
8. An indexed *Minute-Book* for the board of management, or other authorities.

If the admission to the library be by way of ticket, as at the British Museum, an "Admission-book" will be required for the registration of readers, and this book should, of course, have an alphabetical index. If the library be open to all comers, there may still be a sort of "Day-book," in which readers should be requested themselves to enter their names and addresses. On behalf of the more free system of admission, there may be adduced its wide-spread prevalence on the Continent, and the extensive testimony which has been recently borne by foreign librarians and other officers to the absence of any noticeable abuse or mischief thence arising.¹ On the other hand, it has been alleged, and (at all events, until a very late period) with much appearance of justice, that the greater facilities and freedom which it has been usual to afford in the principal British libraries to readers, when once admitted, warrant the exaction of *some* preliminary introduction, by way of guarantee of their respectability.

Of late, however, the operation of Mr Ewart's Act in some of the largest towns in England has brought evidence to bear on this question which is wholly new. It has been proved by experience, that an aggregate issue of 200,000 volumes may be made in one library of a densely peopled city, on the principle of unrestricted admission, without the loss of a single book. It cannot, of course, be asserted that such experience is precisely parallel, in any particular, to the case of a great national library like that of the British Museum. The wear and tear which, by this plan, falls on books that chance to be in popular demand is enormous, and of itself would necessitate restrictions for the protection of such as are not easily replaceable. The true deduction from this recent experience seems, on the whole, to be, that the metropolis, and every other great city and town in the empire, should have its free libraries, open to all who choose to enter; and that the regulations of the old libraries may, with perfect safety, be relaxed under judicious management; but it does not follow that the same rules will suit all libraries.

The applicability of Mr Ewart's Act of 1855 (18th and 19th Vict., c. 70) extends, first, to all municipal boroughs, the po-

¹ On this point, the returns relating to Foreign Libraries, obtained through the Foreign Office (at the instance of Mr Ewart's Committee), and presented to Parliament in the years 1850, 1851, and 1852, contain abundant and conclusive evidence.

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pulation of which, at the last Census that shall have been taken, shall have been found to exceed 5000 persons; secondly, to all districts of like population having an Improvement Board; thirdly, to all parishes of like population; and fourthly, to any two or more neighbouring parishes having an aggregate population of like extent. In order to its adoption, a public meeting of rate-payers must have been duly convened, and the proposition must have been voted for by *two-thirds* at least of the persons there present. If the proposition be so carried, the act comes at once into operation. The Town Council, or Improvement Board, or Parish Vestry, as the case may be, become empowered to levy a library rate, not exceeding one penny in the pound on the rateable value of the assessable property in the borough, district, or parish. The library rate may be applied wholly to the establishment of a library, or partly to a library and partly to a museum. The management and control of the libraries and museums thus established is, in a city or borough, vested in the Council; in a district, in the Improvement Board; in a parish, in Commissioners to be named by the Vestry. Such commissioners must be rate-payers, and in number not less than three nor more than nine. The Council, or other body, have powers to provide books, newspapers, maps, specimens of art and science, and all other needful matters; and to employ all requisite officers and servants. It is further enacted, that admission to all libraries and museums, established under the act, shall be free of all charge.

Other acts (17th and 18th Vict., c. 64, and 18th and 19th Vict., c. 40), differing chiefly in their local machinery, make similar provision for Scotland and for Ireland; but in Scotland a poll may be demanded by any five qualified voters, which poll must be taken within two days of the meeting at which it shall have been demanded.

Almost all the libraries which have been founded under the act include reference departments, and lending departments. In the lending department attached to the Free Library of Manchester, no person is allowed to borrow a book from the library without first obtaining the signatures and addresses of two rate-payers, whose names appear on the Burgess Roll of Manchester, or on that of Salford, and who, by a voucher, undertake to replace any book which shall be lost or materially injured by the person borrowing.

The indispensable account-books of a lending library will be—1. A *Register-Book*, in which to enter the number and short title of every book borrowed, and the name and address of the borrower. This register should have a column for the progressive number of each day's issues (such number to be marked in the book borrowed, upon a proper "issue page" inserted in every volume which the

lending library contains), and another column in which to mark the due return of the book so entered. 2. An *Application and Guarantee Book*, in which every applicant is entered, with the name and address of his "guarantee," the date of application, and the date and number of the ticket issued to him. Such book will need two alphabetical indexes—(1), borrowers; (2), guaranties. 3. A *Shelf Catalogue*. 4. A *Fines-Book*, in which to enter all books lost or injured, and the sums paid in compensation.

With careful superintendence, uniform enforcement of the rules, and a strict *periodical* calling-in of all books lent, for due examination, it will be found that a lending library may be successfully worked on the most liberal terms of access, in the most populous towns, with a loss so inconsiderable (the inevitable wear and tear of an enormous issue, of course, excepted), as to be unworthy of notice. In the case of the Manchester Free Library, the lending issue, in three years, was 236,320 volumes. The total loss to the library was *ten* volumes, the collective value of which did not exceed one and twenty shillings. If the peculiarly *moveable* character of a considerable portion of the population of manufacturing towns be taken into account, such an experience may well be deemed encouraging.

One of the most striking changes in regard to the working of *popular* libraries which has marked the onward course of years, is unquestionably the disappearance of restrictions as to the class of books admitted, which were once of almost universal prevalence. Books on theology, and books on politics, were, not very many years ago, tabooed, by express rule, from the shelves of not a few public libraries, and especially from such as were intended for the humbler classes of society;—in other words, precisely that mental nutriment which meets the highest spiritual wants, and also that which deals with the most urgent material necessities of men, were excluded. *Not* to exclude them involves, unquestionably, the circulation of books in which more or less of error is mingled with more or less of truth. An eminent statesman has supplied, in statesman-like words, an answer to the objection:—

"Why not," said Lord John Russell, at a public meeting on the 17th Nov. 1855, "permit the free circulation of truth and error;—leave to truth its own all-sufficient armour, and to error its own stratagems and delusions,—leave argument to be met by argument, assertion by inquiry? If the just cause suffer for a time, if human credulity embraces error with ardour, and is cold as ice to truth, we may yet rely that the light of free discussion will in time disperse the mist of false opinions,—that, however slow the process, the test of free examination will in time separate the dross from the genuine ore." (E. E.)

LIBRARIES (HISTORY OF).

In almost all parts of the world where civilization has made any considerable progress, traces may be discovered of the existence of libraries. At the period of the Spanish invasion of South America, for instance, emblems or pictorial representations were employed instead of writing; letters being wholly unknown: in Yucatan and Honduras there were books composed of the leaves of trees; and in the kingdom of Mexico the natives had, by way of *library*, histories and calendars, in which they painted such things as had proper figures by their natural representations, and such as had none, by means of various other characters, so that they expressed in this way whatever they pleased.¹ This may be considered as a library in its earliest stage; for all those that are described as having belonged to the ancients were

composed of rolls, which, though different in form from our books, supplied the place of them, and, when collected, constituted a library, even in the modern acceptance of that term.

I.—ANCIENT LIBRARIES.

As the earliest form of the graphic art appears to have consisted in inscribing or engraving characters on stone, metal, wood, or other durable substance, so the first public libraries were composed exclusively of archives deposited in the temples, that the acts relating to history and public law might there be preserved. This will be found to hold true almost universally. Men invariably begin with what is ab-

¹ Herrera, decade ii., book ix., c. 4.

Internal
regulation,
&c., of
libraries.

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Libraries.

solutely necessary to their well-being; and it is only after the lapse of a long interval that time and the progress of improvement add the useful to the necessary, and the ornamental to the useful.

Libraries
of the
Egyptians.

Osymandyas, one of the ancient kings of Egypt, is said to have been the first who founded a library, and established it in a division or compartment of the edifice which has sometimes been called his palace, and sometimes his tomb. On the entrance was inscribed the words ΨΥΧΗΣ ΙΑΤΡΕΙΟΝ, *The Dispensary of the Soul*; whilst the sculptures upon the walls represented a judge, with the image of truth suspended from his neck, and many books or rolls lying before him. Such is the account given by Diodorus,¹ who had himself visited Egypt, but who merely mentions the edifice, without giving us any information as to its contents. It probably contained works of very remote antiquity, and also the books accounted sacred by the Egyptians, all of which perished amidst the destructive ravages that accompanied and followed the Persian invasion under Cambyzes.

Both Wilkinson² and Champollion³ identify with the building referred to by Diodorus the well-known monument,—usually designated the “Memnonium,” but preferably the “Ramesium,”—on the door-jambs of one of the inner halls of which may still be seen representations of Thoth, the inventor of letters, and the goddess Sakh, his companion, with the titles “Lady of Letters,” and “President of the Hall of Books.” In a certain sense, this monument is familiar to thousands of persons who have never visited Egypt, as from it was obtained that “Head of the young Memnon,” which has long been so conspicuous an object in the Egyptian Gallery of the British Museum.

There was also, according to Eustathius and other ancient writers, a fine library at Memphis, deposited in that temple of Phtha, from which Homer was idly accused of having stolen both the *Iliad* and the *Odyssey*, and afterwards published them as his own. From this charge, however, the bard has been vindicated by various writers, and by different arguments.

But the most superb library of Egypt, perhaps of the ancient world, was that founded by Ptolemy Soter, at Alexandria, and enriched by successive sovereigns of that country. About the year B.C. 290, this Ptolemy, a learned prince, founded an academy at Alexandria, called the Museum, where there assembled a society of learned men, who were devoted to the study of philosophy and the sciences; and for their use he formed a collection of books, the extent of which has been very variously computed.⁴ Josephus puts a speech into the mouth of Demetrius Phalereus, as addressed to Ptolemy, in which he says, that there were about 200,000 volumes in the library, and “that in a little time there would be 500,000;” but the entire story—like that as to the origin of the Septuagint—is a fable, having no sort of authority. Demetrius Phalereus was never librarian of the Alexandrian Library. Ptolemy Philadelphus, an equally liberal and enlightened prince, collected great numbers of books in the temple of Serapis, in addition to those accumulated by his father, and at his death left in it, according to the statement of Eusebius, about 100,000 volumes. He had agents in every part of Asia and of Greece, commissioned to search out and purchase the rarest and most valuable writings; and amongst those which he procured were the works of Aristotle, purchased of Neleus.⁵ The measures adopted by Ptolemy

Philadelphus, for augmenting the Alexandrian Library, were pursued by his successor Ptolemy Euergetes, with unscrupulous vigour. He caused, it has been said, all books imported into Egypt by foreigners to be seized and sent to the academy or museum, where they were transcribed by persons employed for the purpose; upon which the copies were delivered to the proprietors, and the originals deposited in the library. He borrowed of the Athenians the works of Sophocles, Euripides, and Æschylus; caused them to be transcribed in the most elegant manner possible; retained the originals for his own library; and returned to the Athenians the copies which had been made of them, with fifteen talents⁶ for the exchange. As the museum, where the library was originally founded, stood near the royal palace, in the quarter of the city called Bruchion, the books, it is supposed, were at first deposited there; but when this building had been completely occupied with books to the number of 400,000 volumes, a supplemental library was erected within the Serapeum, or temple of Serapis; and the books there placed gradually increased to the amount of 300,000 volumes; thus making, in both libraries, a grand total of 700,000 volumes.

The Alexandrian Library continued in all its splendour until the first Alexandrian war, when, during the plunder of the city, the Bruchion portion of the collection was accidentally destroyed by fire, owing to the recklessness of the auxiliary troops. But the library in the Serapeum still remained, and was augmented by subsequent donations, particularly by that of the Pergamean Library, amounting to 200,000 volumes, presented by Mark Antony to Cleopatra; so that it soon surpassed the former both in the number and in the value of its contents. Seneca affirms that the Alexandrian Library was rather to be considered a pompous spectacle for the public, than a place for the studies of the learned.⁷ At length, after various revolutions under the Roman emperors, during which the collection was sometimes plundered and sometimes re-established, it was utterly destroyed by the Saracens, under the orders of the Caliph Omar, when they acquired possession of Alexandria, A.D. 642. Amrou, the victorious general, was himself inclined to spare this inestimable treasury of ancient science and learning; but the ignorant and fanatical caliph, to whom he applied for instructions, ordered it to be destroyed. “If,” said he, “these writings of the Greeks agree with the Koran, or book of Allah, they are useless, and need not be preserved; if they disagree, they are pernicious, and ought to be destroyed.” The sentence of destruction was executed with blind obedience. The volumes of parchment, or papyrus, were distributed to the four thousand baths of the city; and such was their incredible number, that six months were scarcely sufficient for their combustion.⁸

This, at all events, is the received account of a memorable event, and, although often questioned, it has never been satisfactorily refuted. But it should be borne in mind, that the identification of the library destroyed by Omar with the library which had been established, and *perhaps* restored in the Serapeum, is wholly conjectural. The Temple of Serapis had itself been demolished two hundred and fifty years before by Theophilus, Archbishop of Alexandria, and it is certain that the library was then pillaged if not destroyed. Orosius has recorded the feelings of indignation aroused, towards the close of the fourth cen-

¹ Diodorus Siculus, lib. i., c. 2.

² Wilkinson, *Manners and Customs of the Ancient Egyptians*, vol. i., pp. 111–116. See also Osburn, *Monumental History of Egypt*, vol. ii., p. 459.

³ *Lettres*, 285, as quoted by Kenrick, *Ancient Egypt*, vol. i., p. 155.

⁴ Joseph. *Ant. Jud.*, lib. xii., c. 2; *Encyclopédie*, tom. ii., art. *Bibliothèque*.

⁵ Athenæus, lib. i., c. 4, ed. Schweighäuser.

⁶ Upwards of £3000 sterling.

⁷ *De Tranquillitate Animi*, cap. 9.

⁸ Gibbon (*Decl. and Fall of the Roman Empire*, vol. ix., p. 440) has endeavoured to disprove the positive account given by Abulfaragius, by means of negative arguments. It should be considered, however, that the direct and positive statement of an historian of such unquestionable credit as Abulfaragius, cannot be set aside by arguments of a negative and hypothetical character.

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tury, by the sight of the still empty shelves. (*Nos vidimus armaria librorum, quibus direptis, exinanita ea a nostris hominibus, nostris temporibus memorant.*¹) Besides the two great libraries which have been already described, Alexandria possessed a third in the Sebasteum, or Temple of Augustus, and a fourth of much later date than the others, attached to its famous "School." If the last named collection were the object of Omar's fanaticism, the loss to learning may have been less severe than has usually been imagined.

Libraries
of the He-
brews.

The ancient Greeks, whose poetry has been to us the primary source of all our profane literature, had as yet no other theology than the system which resulted from observations made on the theory of the different parts of nature, at a time when the Hebrews, in the books of Moses, cited by one of those ancient historians who copied the chronicles,² read the account of the creation, and, along with it, a summary of the traditions of fifteen centuries of continuous history. These books composed the first collection of the Hebrews; but subsequently this people, like most others, had their archives. Those which Herod caused to be burned, with the intention of destroying the monuments of the ancient families, appear to have reached as far back as the very origin of the nation.³ But though he consigned the public records to the flames, those of individuals were beyond his power, and afterwards served to re-establish the history of this subjugated people. There also existed libraries, properly so called, in Judæa. One in particular is supposed to have been attached to, if not kept in, the temple of Jerusalem, and the Hebrew authors speak of "the multitude of books;" an expression which seems to imply that the collection was not confined to the sacred books alone, but included others, relating probably to the laws and institutions of Moses, and the history of the Jewish nation. The books, particularly those of history, had indeed become so numerous, that Judas Maccabeus caused extracts to be made and circulated from those contained in the library of Nehemiah,⁴ mentioned in the second book of Esdras, in which also were preserved the writings of the prophets, the compositions of David, the letters of the Hebrew kings, and the records of offerings. We know nothing of early Jewish literature beyond the books which are contained in the Old Testament. It has been supposed, however, that they had some cities celebrated on account of the sciences which were there cultivated. Amongst these may be mentioned the town called by Joshua *Kirjath-sepher*, or the *City of the Book*, which was situate near the confines of the tribe of Judah. In later times, the university or school of Tiberias was not less celebrated. It is probable that this and other academies of the same description were furnished with libraries.⁵

Libraries
of the
Persians.

Scripture also mentions a library of the kings of Persia, which some suppose to have consisted of the historians of that nation, and of memoirs on the affairs of state, but which appears rather to have been a depository of the laws, charters, and ordinances of the Persian kings. In the Hebrew text it is stated that a search was made "in the house of the rolls, where the treasures were laid up in Babylon," for a decree issued by Cyrus ordaining a temple to be built at Jerusalem; the ordinance sought for, however, was found, not in Babylon, but at Acmetha, in Media.⁶ It appears that "the house of the rolls" was not a library belonging to the Persians, but a collection of the records or archives

of the kingdom. In the recent discoveries in Assyria, in the palace at Nineveh, a vast collection of clay tablets, inscribed with cuneiform inscriptions was found, forming, as it were, the royal library. The progress made in deciphering the inscriptions, in this cuneiform character, was brought before the meetings of the British Association at Glasgow and at Cherttenham, by Colonel Sir Henry Rawlinson, in two most interesting lectures. This system of cuneiform writing was found to be closely allied to the hieroglyphic expression; and, although many of the rock inscriptions of Persia were trilingual, each of the languages, the Chaldee, Assyrian, and Babylonian, being unknown, it seemed to defy all attempts at translation; yet this has been accomplished by a singular combination of learning and ingenuity. Sir Henry Rawlinson stated that about 20,000 of these tablets, more or less injured by fire, were now brought to England, and are in the British Museum; and that the extensive series, when fully deciphered, would be the means of furnishing most important additions to our knowledge of the ancient world. Of these cuneiform inscriptions, lithographic facsimiles are about to be published by the Trustees of the British Museum; and half of the impression is to be placed at the disposal of Sir Henry Rawlinson, who will, at his own expense, accompany these copies with literal translations, in Latin.

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Libraries.
Tabular
libraries
of the
Assyrians.

Very recently, M. Jules Oppert (to whom has been entrusted by the French government the mission of examining and reporting on the acquisitions for which the British public are mainly indebted to the research and energy of Mr Layard) has copied a considerable series of these inscribed tablets, and has expressed his conviction that there is a large class of them to which, in a special and unique sense, the designation of a "public library in clay" is applicable. These he believes to have been prepared by command of Sardanapalus V. (about B.C. 650), expressly for purposes of public instruction; and he quotes a remarkable inscription to this effect: "Palace of Sardanapalus, king of the world, king of Assyria, to whom the god Nebo and the goddess Ourmit have given ears to hear and eyes to see what is the foundation of government. They have revealed to the kings my predecessors this cuneiform writing. The manifestation of the god Nebo . . . of the god of supreme intellect,—I have written it upon tablets,—I have signed it,—I have put it in order,—I have placed it in the midst of my palace for the instruction of my subjects."⁷

Amongst the Greeks, as amongst other nations, the first Libraries consisted merely of archives, deposited, for the sake of the preservation, in the temples of the gods. The sacred books, of which mention is made by Dionysius of Halicarnassus, under the denomination of *Deltids*, were of this description.

It has been often said that Pisistratus the tyrant was the first who established a public library in Athens; but the statement rests mainly on the testimony of Aulus Gellius, who wrote about seven hundred years after the time of Pisistratus. In this alleged library, the founder is said to have deposited the works of Homer, which he had collected with great difficulty, and at a very considerable expense; and the Athenians themselves were at great pains to increase the collection. The reputed fortunes of this library were various and singular, if true. It was transported to Persia by Xerxes; brought back by Seleucus Nicator; plundered by Sylla; and at last restored by the Emperor Hadrian. The entire story,

¹ Orosius, ed. Havercamp, b. vi., c. xv., 421.

² Eusebius, *Historia Eccles.* lib. i., c. 7.

³ Inferebantur autem in descriptionibus, et commentariis Nehemiæ hæc eadem; et ut construens *bibliothecam* congregavit de regionibus libros, et prophetarum, et Davidica, et epistolas Regum, et de Donariis. (*Machab.* lib. ii., c. ii., v. 13.) Considerantes enim multitudinem librorum . . . hoc opus breviandi causa suscepimus. (*Machab.* lib. ii., c. ix., v. 25.)

⁴ *Encyclopédie*, tom. ii., p. 229.

⁵ *Rapport à M. le Ministre de l'Instruction Publique*, printed in the *Archives des Missions Scientifiques*, Mai, 1856, vol. v., p. 179.

⁶ Hellanicus, apud Justinum, *ad Græcos Cohortat.*, p. 18.

⁷ Ezra, chap. v., verse 17; and vi. 1, 2.

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however, is a conjectural one. That Pisistratus was a promoter of learning, and that he rendered eminent service by his Homeric researches, is incontestible. But that he formed anything which even remotely resembled a library, in the ordinary meaning of the term, is an assertion unsupported by adequate evidence; and just as little foundation is there for the romantic vicissitudes which complete the tale. Nor is there much better authority for the statement, that when, on the invasion of the Roman empire by the Goths (A.D. 260), Greece was ravaged, and in the sack of Athens they had collected all the libraries, and were upon the point of setting fire to this funeral pile of ancient learning, one of their chiefs interposing, dissuaded them from the design, observing at the same time, that as long as the Greeks were addicted to the study of books, they would never apply themselves to that of arms.

Strabo has stated that Aristotle was the first known collector of a library, and that to him was also due the honour of having suggested to the Ptolemies the formation of that great collection, which was scarcely more the wonder of antiquity than it has been the conundrum of modern scholarship. Aristotle bequeathed his library, with many of his own writings, to Theophrastus, who appears to have made considerable additions to it, and who, in his turn, bequeathed it to Neleus. The latter, according to Strabo, carried the collection to Scepsis in the Troad, where it subsequently fell into disorder, and was at length concealed in a cave, that it might escape the eager researches of the kings of Pergamus. "At length," continues Strabo, "but not before the books had been injured by damp and worms, they were sold to Apellicon of Teos,—rather a collector than a philosopher (*φιλόβιβλος μάλλον ἢ φιλόσοφος*),—who, by unskilful attempts at the restoration of defective and mutilated passages in the writings of Aristotle, increased the injury by corrupting the text."¹ On the capture of Athens by Sylla, the Library of Apellicon—not that of Pisistratus—was seized by the conqueror and carried to Rome.

But Strabo's account of the matter—on which mainly was founded the absurd story so long current as to the loss for several generations of the Aristotelian writings—is entirely at variance with that given by the epitomist of Athenæus, according to whom the Library of Neleus had long before been bought by Ptolemy Philadelphus and transferred to Alexandria, "with all those which he had collected at Athens and at Rhodes."² This statement accords better with the known existence and publicity of Aristotle's works, but has its own difficulties. It is, however, at least matter of reasonable probability that, from whatever cause, part of the collection went to Alexandria, and part remained at Scepsis. From the rivalry of the Attalic kings with the Ptolemies, it may well have resulted that the fame of the acquisition for Alexandria of part of the library of Aristotle, may have given a keener edge to their covetousness of what remained.

Library of
Pergamus.

Next to the Alexandrian Library, that of Pergamus was the most conspicuous, and, according to Plutarch, contained 200,000 volumes. It was founded and successively enriched by the kings of Pergamus, all of whom were zealous promoters of the arts, and to one of whom we are indebted for the invention of parchment (*Charta Pergamena*). Attalus surpassed all his predecessors in magnificence, and after their example devoted part of his treasures to the purchase of the principal works or writings of his age. As already noticed, the Pergamean Library was presented by

Antony to Cleopatra, in order to form the foundation of a new library at Alexandria. Vitruvius makes honourable mention of both these libraries.³

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These particulars, scanty as they may no doubt seem, are nevertheless sufficient to show that the libraries of Greece, in ancient times, were both numerous and extensive. But a question of much more immediate interest here presents itself, viz., whether any of the treasures which they were enriched still remain undiscovered, and where these may be supposed most likely to be found. On this subject various conjectures have been formed, particularly in regard to the remains of the ancient Greek historians. It is well known that many manuscripts had been collected at a vast expense in Greece for the Library of Buda, which was destroyed by the Turks in the year 1526. In this library Alexander Brassicanus had seen the whole of the *Hyperides* with *scholia*, the works of many of the Greek fathers, and also those of classical writers. From it issued parts of Polybius and of Diodorus Siculus. A manuscript of Heliodorus, from which was afterwards printed the first edition of the *Æthiopica*, likewise belonged to it, having been found by a soldier, who carried it to Vincentius Obsopæus. Neander, speaking of this collection, says, "Ex media Græcia inæstimandis sumptibus emerat Matthias Corvinus rex."⁴

Constantinople and Athos have contributed the greater number of the ancient manuscripts which are still extant in different parts of Europe. Until a comparatively recent period there were monasteries full of learned men at Byzantium, and every monastery had its library. The Turks, on their conquest of Constantinople, did not indulge in that indiscriminate destruction which has sometimes been imputed to them. Mohammed II. secured the library of the Greek emperors, which his successors preserved until it was destroyed by Amurath IV. At Byzantium, Constantine Lascaris transcribed many of the works which were afterwards conveyed to the Royal Library at Madrid; and in this city were procured those manuscripts which, having been presented to Hurtado de Mendoza by Solymán II., were left by the former to the Library of the Escorial. Possevin has given partial catalogues of some of the libraries at Constantinople; and an early traveller, who visited that city in the year 1597, mentions a valuable collection which he had seen there, though without specifying its contents. With respect to Athos, it appears that there were deposited in one library alone 200 manuscripts, originally obtained from the monasteries upon the mountain; and a great part of those formerly at Moscow had been collected by the monk Arsenius, in Athos, at the suggestion of the patriarch Nikon. Thessaly, Chios, Corfu, Crete, Cyprus, Chalcæ, Rhodes, and Epidauria, may also be mentioned as places which, at different times, have supplied manuscripts.

Mr Walpole long since expressed the opinion, that notwithstanding the acquisitions which have already been made, researches in the Levant should not be intermitted. By these many manuscripts may still, according to him, be rescued from destruction.⁵ No care whatever appears to have been taken to preserve them. Dr Covel mentions having seen, in the monasteries of Mount Athos and elsewhere, vast heaps of manuscripts of the Fathers, and other learned authors, all covered over with dust and dirt, many of them rotten and spoiled, and never in any instance placed upon shelves or arranged in good order.⁷ A list of the theological manuscripts in the Library of Patmos has been

¹ Strabo, lib. xiii., pp. 608, 609.

² Athenæus, *Deignosoplistarum libri xv.* (ed. Schweighäuser, Argent., 1801-7), lib. I., 4.

³ Tertull. *Apol. c. 18.* Vitruvius, lib. vii. in *præfat.* "Reges Attalici," says he, "magnis philologiæ dulcedinebus inducti, cum egregiam Bibliothecam Pergami ad communem delectationem instituissent; tunc item Ptolemæus, infinito zelo cupiditatisque incitatus studio, non minoribus industriis ad eundem modum contenderat Alexandriæ comparare." (*Argentorati*, 1807.)

⁴ *Epistolæ*, p. 10.

⁵ *Memoirs relating to European Turkey*, published in 1817.

⁷ Covel, *Some account of the present Greek Church* (1722, fol.)

⁶ The island in the Propontis or Sea of Marmora.

Ancient
Libraries.
Researches
for ancient
Greek MSS.

given by Possevin; and another, copied by the Marquis of Sligo, has been published by Mr Walpole. The actual catalogue contains the titles of 92 manuscripts, and about 400 printed volumes; but the Greek compiler has not stated any circumstance relating to the manuscripts by which an estimate of their value may be formed. He gives no information concerning the form of the letters or that of the manuscripts, or upon any of those subjects by which a knowledge of their respective dates might be obtained. But there is one manuscript mentioned in the catalogue, in regard to which it is impossible not to feel more than ordinary curiosity. We allude to a manuscript of Diodorus Siculus, an accurate inspection of which would probably determine whether the hopes which were oftener than once entertained, of recovering the lost books of that historian, were in this instance also to be disappointed.¹ But, without dwelling longer upon particulars, we may observe, that notwithstanding the sanguine expectations entertained by the admirers of ancient learning, very few valuable manuscripts have latterly been discovered; and, with the exception of the fragments of ancient authors, deciphered from palimpsest, or rescribed manuscripts, it must be admitted, that those accidentally rescued from destruction have, in general, been either of comparatively modern date or of but little consequence. Neither the inquiries which have been extended to the African states, nor the excavations and researches made at Herculaneum and Pompeii, have recovered the lost historians, or indeed brought to light any works of importance.² (See HERCULANEUM.)

The Hon. Robert Curzon, in the charming volume which describes his *Visits to the Monasteries in the Levant*, records his success in Abyssinia, Turkey, and Greece, in obtaining a number of very early and important MSS. A portion of these MSS. are described in a *Catalogue of Materials for Writing; Eastern Writings on Tablets and Stones, Rolled and other Manuscripts, and Oriental Manuscript Books, in the Library of the Honourable Robert Curzon, at Parham, in the County of Sussex* (London, 1849, folio). Of this volume, which contains various interesting facsimiles, only 50 copies were printed. From information communicated by Mr Curzon as to the existence of ancient Greek scrolls in the monasteries of the East, the Rev. H. O. Coxe has recently (1856) obtained leave of absence from the Bodleian Library, at the request of government, to proceed to the Levant, in search of such MSS.; and a more competent scholar for such an object could not have been found.

The French government has also turned its attention towards the same object, and has entrusted a similar mission to M. Lebarbier, a young but already distinguished student of the *École Française d'Athènes*. In August 1856, M. Guignaut, in the name of a committee appointed to examine the works and proceedings of this school at Athens, read a report to the Academy of Inscriptions, in which the first fruits of M. Lebarbier's labours are described, with more especial reference to a library designated by M. Guignaut the "Library of the Holy Sepulchre at Constantinople." After stating that the library possesses a considerable number of MSS., M. Guignaut proceeds: "But, unfortunately, these MSS. comprise little besides homilies, prayers, theological and controversial treatises (written at periods not very remote from our own), translations from Latin or Italian into modern Greek, . . . and works of like kind. The ancient authors, all long since published, are for the most part modern transcripts." . . . "But," adds the learned reporter, "if the Library of the Holy Sepulchre

offers little aid to classical literature, it is rich in documents which throw new light on the history of the Greeks after the fall of the Byzantine empire."³ Thus far, it must be admitted, these renewed researches do not present a very promising aspect as regards that particular department of literature with which alone we have here to do. But the field is one in which the discoveries of an hour may possibly present rich compensation for the toil of years.

Rome was still in its infancy when the archives of the Etruscans contained a continuous collection of public acts, and particularly an uninterrupted series of births and deaths, that enabled that people to fix the unequal duration of the eight centuries of their previous history, which they reckoned up to about the middle of the sixth century before Christ. The details given by Censorinus in Varro, prove that the Etruscans kept regular registers of births and deaths, from the epoch of their first establishment in Italy, which Larcher refers to the year 1844 before Christ; that, the eighth century thereafter, to which the Etruscan histories were written, must have been the sixth before the Christian era, in which other histories appeared that are no longer extant, and that, during these eight hundred years, the most extended term of human life was nearly the same as at the present day. In the works of Dionysius of Halicarnassus, of Plutarch, and other ancient authors, we also discover scattered glimpses of the history of Italy in the most remote times, and learn that the tribes or races by whom the Etruscans were surrounded had also their historical archives. It may even be supposed that the Romans, in causing their Capitoline marbles to be engraved, followed, amongst others, the example of Præneste, a city much more ancient than Rome, and which had long continued the practice of classifying, as well as engraving its municipal records. Such were the sources consulted by several historians who treated of the antiquities of different Italian nations, particularly Zepodotus of Trezene, who composed a history of the Ombrians.

If the ancient Greeks had but few books, the ancient Romans possessed still fewer. Incessantly occupied in military expeditions, defensive wars, and the aggrandizement of their empire, that warlike people had no leisure, and, probably, as little inclination, to cultivate letters. It was not until they had subdued Magna Græcia that they began to emerge out of barbarism, nor until they had accomplished the conquest of Greece itself, that a taste for arts, sciences, and books was diffused amongst them. They became civilized by frequent contact and familiarity with civilization. The immediate consequence of the conquest of Greece was a more frequent intercourse with the Greeks, at once their subjects and their masters; and in proportion as they became acquainted with the literature and arts of that refined people, the asperity of character and manners which had distinguished this nation of conquerors began to disappear.

The first library established at Rome was probably that founded by Paulus Æmilius, B.C. 167. Having subdued Perses, King of Macedonia, he enriched the city of Rome with the library of this conquered monarch, which was subsequently augmented by Sylla.⁴ On his return from Asia, where he had successfully terminated the first war against Mithridates, Sylla visited Athens, whence he took with him that Library of Apellicon the Teian, which has been mentioned already. Lucullus, another conqueror of Mithridates, was not less distinguished by his taste for books. The number of volumes in his library was immense; and they

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¹ See Mr Walpole's observations on this subject, published in Dr Clarke's *Travels*.

² *Mémoires de l'Académie des Inscriptions*, tom. vii.; *Nouveau Traité de Diplomatique par deux Benedictins*; Villoison, *Anecdota Græca*, tom. ii.; Fabricius, *Bibliotheca Græca*, tom. xiv.

³ *Journal Général de l'Instruction Publique* (1856), vol. xxv., p. 419.

⁴ Such is the statement of Isidorus (*Origines*, l. vi., c. 4), though Plutarch (*in Vit. Æmil.*, tom. ii., p. 180, ed. Bryan) expressly says that he reserved for his sons, who were lettered men, the books taken from the library of King Perses.

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were written in the most distinct and elegant manner possible. But the use which he made of his collection was still more honourable to that princely Roman than the acquisition or possession of it. His library was open to all; and the Greeks, who visited Rome, resorted to the galleries and porticos of Lucullus as to the retreat of the Muses, where they spent whole days in conversation on literary subjects. But although both Sylla and Lucullus liberally gave public access to their literary treasures, still their libraries can, in strictness, be considered as only *private* collections. Amongst the various projects which Julius Cæsar had formed for the embellishment of Rome was that of a *public* library, which should contain the largest possible collection of Greek and Latin works; and he had assigned to Varro the duty of selecting and arranging them; but it has been supposed that this design was frustrated by the assassination of the dictator; and that the establishment of public libraries did not take place until the reign of Augustus.

The honour of suggesting these valuable institutions is ascribed by the elder Pliny¹ to Asinius Pollio, who erected a public library in the atrium of the temple of Liberty, on Mount Aventine Hill. This library, it is added, was formed *ex manubiis*, and in it was placed a bust of Varro. It would seem probable, from the latter circumstance, that Varro after all may have carried out the plan entrusted to him by Cæsar, and that Pollio may have merely enlarged the library thus begun. The exploits that were most likely to have yielded him the spoils of war, were of a date long subsequent to that of Cæsar's commission to Varro.² Augustus, amongst other embellishments which he bestowed upon Rome, erected two public libraries, viz., the Octavian and the Palatine. The Octavian Library, which was thus denominated in honour of the emperor's sister, stood in the portico of Octavia; and the charge of it was committed to Melissus, who had been manumitted by Augustus. The Palatine Library was added by Augustus to the temple of Apollo, which he had erected on the site of that part of the Palatine House which had been struck by lightning. There were deposited the corrected books of the Sybils; and, from two ancient inscriptions quoted by Lipsius and Pitiscus, it would seem that it consisted of two distinct collections, one Greek and the other Latin. This library having survived the various revolutions of the Roman empire, existed until the time of Gregory the Great, whose mistaken zeal led him to order all the writings of the ancients to be destroyed.³ The successors of Augustus, though they did not equally encourage learning, were not altogether neglectful of its interests. Suetonius informs us that Tiberius founded a library in the new temple of Apollo; and we learn from some incidental notices, that he instituted another in his own house, called the Tiberian Library. Vespasian, following the example of his predecessors, established a library in the temple of Peace, which he erected after the burning of the city by order of Nero; and even Domitian, in the commencement of his reign, restored at great expense the libraries which had been destroyed by the conflagration, collecting copies of books from every quarter, and sending persons to Alexandria to transcribe volumes in that celebrated collection, or to correct copies which had been made elsewhere. Various writers have asserted that there was a library attached to the Temple of the Capitol; but they have not informed

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us by whom it was founded. Lipsius ascribes it to Domitian; whilst Donatus refers it to the Emperor Hadrian, by whom it was at least enlarged, if not founded, and who probably erected the Tiburtine Library, at Tibur, in the vicinity of Rome.⁴ But the most magnificent of all the libraries founded by the sovereigns of imperial Rome was that of the Emperor Ulpian Trajanus, from whom it was denominated the Ulpian Library. It was erected in Trajan's Forum, but afterwards removed to the Viminal Hill, to ornament the baths of Diocletian. In this library were deposited the elephantine books, written upon tablets of ivory, wherein were recorded the transactions of the emperors, the proceedings of the senate and Roman magistrates, and the affairs of the provinces. It has been conjectured that the Ulpian Library consisted both of Greek and Latin works; and some authors affirm that Trajan commanded all the books which could be found in the cities he had conquered to be immediately conveyed to Rome, in order to increase his collection. The library of Domitian having been consumed by lightning, in the reign of Commodus, was not restored until the time of Gordian, who rebuilt the edifice, and founded a new library, adding thereto the collection of books bequeathed to him by Quintus Serenus Samonicus, the physician, amounting, it is said, to no less than 72,000 volumes. Donatus conjectures that this library was deposited in the palace of Pompey.⁵

In addition to the imperial libraries, there were others Libraries to which the public had access in the principal cities and in the colonies of the empire. Pliny mentions a public library provinces. which he had founded for the use of his countrymen; and Vopiscus informs us that the Emperor Tacitus caused the historical writings of his illustrious namesake to be deposited in the libraries. But the irruptions of the barbarians who overran and desolated the western empire proved more destructive to the interests of literature than either volcanoes or earthquakes, and soon caused the disappearance of those libraries which, during several centuries, had been multiplied in Italy.

When Constantine the Great (A.D. 336) made Byzantium the seat of his empire, decorated that city with splendid edifices, and called it after his own name; desirous to make reparation to the Christians for the injuries they had suffered during the reign of his predecessor, he commanded the most diligent search to be made after those books which Diocletian had doomed to destruction; he caused transcripts to be made of such as had escaped the fury of the Pagan persecutor; and, having collected others from various quarters, he formed the whole into a library at Constantinople. On the death of Constantine, however, the number of books in the imperial library was only 6900; but it was successively enlarged by the Emperors Julian and Theodosius the younger, who augmented it to 120,000 volumes. Of these, more than half were burned, in the seventh century, by the command of the Emperor Leo III., who thus sought to destroy all the monuments that might impede his opposition to the worship of images. In this library was deposited the only authentic copy of the Council of Nice; and it is also said to have contained the poems of Homer, written in gold letters, together with a magnificent copy of the Four Gospels, bound in plates of gold, enriched with precious stones; all of which were consumed in the conflagration. The convulsions which distracted the lower empire were by no means favour-

¹ "Qui primus bibliothecam dicando, ingenio hominum rempublicam fecit. (Plin. *Hist. Nat.*, lib. xxv., c. 2.) Ovid also ascribes this honour to Pollio. (*Tristia*, lib. iii., el. 1.)

² Merivale, *History of the Romans under the Empire*, ii., 426.

³ Plutarch, in *Marcello*; Suet. *de Illust. Gram.*, c. 41; Idem, in *August.* c. 29; Lipsius *de Biblioth.* c. 7; Pitiscus, *Lexicon*, tom. i., p. 276; Brucker, *Hist. Crit. Philosoph.*, tom. i., p. 20.

⁴ Suet. in *Tiber.* c. 74, et in *Vespas.* c. 9; Aul. Gell. lib. xvi., c. 8; Lipsius *de Biblioth.* c. 20; Suet. in *Domitian.*, c. 20.

⁵ Euseb. in *Commodo*; Capitolinus, in *Vit. Gordiani Junioris*, c. 18; Donatus, *Roma Vetus*, lib. iii., c. 8, p. 119; *Encyclopédie*, tom. ii., art. *Bibliothèque*.

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able to the interests of literature. In the eleventh century learning flourished for a short time during the reign of Constantine Porphyrogenetus; and this emperor is said to have employed many learned Greeks in collecting books, and forming a library, the arrangement of which he himself superintended. But the final subversion of the Eastern Empire, and the capture of Constantinople in 1453, dispersed the learned men of Greece over Western Europe, and placed the literary remains of that capital at the mercy of the conqueror. The imperial library, however, was preserved by the express command of Mohammed, and continued, it is said, to be kept in some apartments of the seraglio; but whether it was sacrificed in a fit of devotion by Amurath IV., as is commonly supposed, or whether it was suffered to fall into decay from ignorance and neglect, it has been repeatedly asserted that the library of the Sultan contains only Turkish and Arabic writings, and not one Greek or Latin manuscript of any importance. The opinions of competent scholars continue, nevertheless, to be divided on this point. Even in Germany, where the expectation of important accessions from this quarter has confessedly declined, we find an authority so eminent on such questions as that of Tischendorff still on the side of the old belief. He thinks it probable, he says (writing in 1845), "that the seraglio of the Sultan conceals ancient and valuable MSS., though complete obscurity prevails as to their contents;" and he proceeds to ask who in our day would have credited the existence of "walled-up" libraries, yet a walled-up library was very lately one of the mysteries of Cairo.¹

Upon the whole, it appears that books were abundant, both at Rome and at Constantinople, and that learned men in those cities had at their command greater resources than might at first be supposed. Some idea of the quantity of books accessible to persons of study and research may be formed from the great number of references and citations to be found in the works of some authors, particularly in those of Strabo, Pliny, and some others. It is, however, to be remembered, while referring to the large number of books said to have been contained in these ancient libraries, that a very erroneous impression would be made were they to be reckoned according to modern computation. Each work being written on separate rolls, the number would necessarily be greatly increased, when the books of Livy or Pliny were each reckoned as a distinct roll, or volume; and Balbi (*Essai Statistique*, &c., p. 82, Vienna, 1835, 8vo.) further suggests the comparison that these rolls of the ancients might be reckoned as so many parts of books, published by subscription, or of periodicals. According to this view, the largest libraries in ancient times might be represented by the contents of a modern library containing from 50,000 to 100,000 volumes.

II.—LIBRARIES OF THE MIDDLE AGES.

General
remarks.

General epithets and figurative expressions frequently convey a meaning which is calculated to mislead. Hearing constantly of "the dark ages," "the period of intellectual night," and "the season of winter in the history of man," we are apt to imagine that, during the time thus designated, the human mind was utterly palsied, and all learning extinct. But in fact, throughout that period, reason, though misdirected, was not asleep; philosophy was rather bewildered than inert; and learning was immured, but not lost. In no part of that long period which extends from the reign of the Emperor Justinian, when Greek and Roman literature everywhere lay open to the light of day, to the fall of Constantinople and the revival of learning in the fifteenth century, do we entirely lose the traces even

of the classic authors, much less of sacred literature; for in each intervening age, and in every quarter of Europe, there were writers whose works, being still extant, afford abundant evidence of their acquaintance with most of the principal authors of more remote times.² When the empire of the west sunk under the overwhelming pressure of barbarian invasion, those institutions which had been founded and nurtured in the midst of civilization, were, no doubt, swept away by the torrent which desolated Italy, and spread its ravages over all parts of the empire. But learning, though expelled from her ancient establishments, and forced from her favourite haunts, found an occasional asylum in the monasteries, which, amidst all the violence and anarchy that reigned without, were sometimes permitted to remain in undisturbed tranquillity, respected even by the barbarians who had overthrown an empire.

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It is doubtless true that comparatively little is recorded of the libraries of those ages which intervened between the fall of the Roman empire and the revival of letters in Europe, about the middle of the fifteenth century. But, every age produced learned and inquisitive men, by whom books were highly prized, and industriously collected. Cassiodorus, minister of Theodore, King of the Goths, retired to a monastery which he had built, and there founded a library for the use of the monks, about the middle of the sixth century. At a later period, Charlemagne, distinguished as a patron of learning, instituted, near Lyons, a library, which, according to the statements of historians, contained many books bound in a magnificent manner.

That on the general merits of the monastic institute the most conflicting opinions should still extensively prevail, cannot be matter of legitimate surprise, if we call to mind that monasticism played a great part in the world for a thousand years; and that during that long period the most incongruous views as to what a monk ought rightly to be in, and to do were current even within the walls of monastic communities. But this diversity of opinion extends also to that more limited phase of cloister life which has relation to literature. Whilst some writers contend that but for monks ancient learning would have wholly perished, others have gone the length of asserting that in monks literature has always had its worst enemies.

Monasteries; system of transcription pursued there-in.

To arrive at any useful conclusion on such a question, it must be remembered that at no time and in no country was literature in any of its forms the main object of monastic life. In the earlier ages, when the embers of Paganism were still smouldering, the preservation of Pagan poetry would have seemed a strange employment for the confessors and missionaries of Christianity. The labours of the Scriptorium originated not so much in the love of letters as in the love of souls. As the monk became less of a mere ascetic, and aspired to become a civilizer, he necessarily began to be a collector of books, and then their author or their transcriber. But, for a long time, the books that he gathered, and those that he composed, were in the main either theological or ethical. Here and there, however, individual minds of special energy grew large enough to perceive classical beauty without relaxing their grasp of such Christian truth as they had, and became the venerated masters of numerous disciples. If monastic literature reflects but too much of the corruption of mediæval Christianity, it remains still undeniable that from Bibles transcribed by monkish hands, and from the best of the productions of the fathers of the church, preserved in monkish libraries, the men who successively wrestled with that corruption, and were the instruments by which Christianity was kept alive, drew their inspiration and their solace; and that very corruption, in some of its results, as, for example, in the re-

¹ Tischendorff, *Travels in the East* (1847), p. 273.

² Taylor, *History of the Transmission of Ancient Books to Modern Times*, pp. 86, 87.

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ligious use of a dead language, contributed to the preservation of ancient learning.

At almost all periods of its history the order of St Benedict stands foremost amongst the cultivators of learning and of the arts. Yet whilst the rule of the founder contains much about visiting the sick, relieving the poor, and keeping the body in subjection, it contains very little indeed about books. Nor is there much more about them in the various constitutions of the successive "Reformers" of the order. But no order was so fortunate in the possession of a long line of men remarkable for mental vigour and force of character. If the early Benedictines are less conspicuous at periods of comparative enlightenment than at periods when all around them was gloomy, they were unquestionably the first pioneers and builders up of European civilization, and they laid its foundations broad and deep enough to resist the attacks of their own unworthy successors. They never sank so low as did most other orders of monks; and at a long subsequent period, in producing the illustrious congregation of St Maur, a service was rendered to learning—in the special sense of that term—which neither has, nor is likely to have, any parallel in monastic history.

Monte Cassino has been called the Sinai of the middle ages. It was certainly the cradle of a series of communities which spread all over Europe, and of which not the least famous were our British monasteries, such as Yarrow, Wearmouth, Bury St Edmunds, Croyland, Whitby, Reading, St Albans, all of which were distinguished for the pains taken in them about the collection and transcription of books. This system of transcription, to which alone we are indebted for all that remains of ancient learning, was carried on to an extent, of which those who are unacquainted with the history of the middle ages can form no conception. We have already had occasion to advert to the occupation of the inmates of the monastic establishments on Mount Athos, the lofty promontory which stretches from the Macedonian coast far into the Ægean Sea; and we have also noticed the immense number of manuscripts which have at different times issued from these establishments. Many manuscripts still extant prove that the copying of books was likewise practised to a great extent during the middle ages, in the monasteries of the Morea, and in those of Eubœa (Negropont), and of Crete (Candia). The latter island seems, indeed, to have been a place of refuge for learned men during the disastrous period which preceded the fall of the Eastern Empire; in its monasteries they found an asylum and the means of subsistence. In Calabria and the kingdom of Naples, fifty religious establishments have been mentioned, from which proceeded a large number of the books afterwards collected in the libraries of Rome, Florence, Venice, and Milan.¹ In the monasteries of Western Europe, also, the same system of transcription was carried on. It is mainly to the labours of these establishments, that we are indebted for the remains of the classic authors, and the preservation of the sacred books, which they so carefully transcribed.

This statement needs no better illustration, or more conclusive proof, than would be furnished by a digest of some of the more important of those catalogues of monastic libraries which have come down to us in no inconsiderable number. But however compressed, it would still be impracticable to supply in this article even the briefest abstract of such a summary. We can only indicate to the reader who may desire to pursue the subject some of the sources of information to which he may resort. And this purpose will probably be better attained by directing him to books in which specimens of such catalogues have been printed, than by any enumeration of those which exist in manu-

script, very curious as are some which remain as yet unpublished.

A catalogue of the library of the famous Benedictine Abbey of Corbey was first printed by Sir Thomas Phillipps, and has been reprinted in the Leipzig journal *Serapeum* for 1841. In later volumes of that periodical will also be found a curious series of ancient catalogues of that of Klosterneuburg (a library which still exists, and in recent days has been magnificently lodged); of Saint Vaast of Arras, and of some other monasteries of minor fame; together with many historical notices of monastic libraries (the full catalogues of which are no longer extant), chiefly from the pen of the accomplished and laborious bibliographer Mr E. G. Vogel of Dresden. An interesting series of catalogues of the books of the great monastery of Durham was edited by Mr Beriah Botfield for the Surtees Society in 1838. The catalogue of the library of the Benedictines at Whitby is printed in the Appendix to Mr Young's *History* of that town, as is the Peterborough catalogue in Gunton's *History of Peterborough*, and that of Glastonbury in Hearne's *Appendix to the Chronicle of John of Glastonbury*. Of the Abbey of Bec, M. Felix Ravaisson published an early catalogue in his *Rapports au Ministre de l'Instruction Publique sur les Bibliothèques des départements de l'Ouest* (1841). Not less interesting, although far more concise than most of these, is that metrical catalogue by Alcuin of the treasures of the Augustinian monastery at York, which Mabillon communicated to Dr Gale for publication in his *Scriptores Rerum Britannicarum*.

The reader who may refer to the texts of some of these catalogues, or who may turn to the many extracts from similar documents which are to be found in the *Spicilegium* of D'Achery, the *Thesaurus Anecdotorum* of Martene, Durand, and Pez, and in the narratives of the literary travels of these and of other Benedictines of St Maur, will perceive that monastic collections were often of no small extent, and of not inconsiderable diversity; nor will he feel much difficulty in admitting that but for monks the dark ages must have been dark indeed.

The revival of learning is usually reckoned to have commenced in the fifteenth century; but even in the fourteenth century. Fourteenth century. a decided advancement in almost every department of literature is discernible. Gross and degrading ignorance was wearing away from the bulk of the community in several parts of Europe; the educated classes were acquiring a better taste and more expanded views; and a general awakening of the energies of the human mind was perceptible. This needs no other evidence than is afforded by the works of Dante, Petrarch, Boccaccio, Chaucer, and Gower, which were not merely produced in that period, but extensively read and admired. During no part of that long tract of time which extends from the decline of learning in the sixth century till its revival in the fifteenth, had there been a total extinction of the knowledge of ancient literature; and those inestimable treasures which the religious houses had saved from the ravages of revolution, anarchy, and barbarism, now began to be drawn forth and studied. The continuance of the Eastern Empire till the middle of the fifteenth century, afforded an uninterrupted protection to Greek learning during those periods when Western Europe was laid waste by the Gothic nations; and hence, on the revival of letters, the study of the Greek authors first engaged the attention of those individuals whom an awakening impulse now directed to the cultivation of learning. But that of the kindred authors of Rome soon followed; and the monuments of ancient wisdom and genius which had been preserved in the monasteries, furnished ample materials for laying the foundations of a new and more extensive, if not more perfect, edifice of civilization.

¹ Taylor, *History of the Transmission of Ancient Books*, p. 83.

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Libraries
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dle ages.

Revival of
learning.

First for-
mation of
modern
libraries.

Invention
of print-
ing.

More than half a century before the taking of Constantinople by the Turks, the learned men of the imperial city, apprehending the approaching ruin of the empire, began to emigrate into Italy. There they opened schools, and became the preceptors of princes, as well as the guides of the public taste, which they directed towards the study of the classical writers of Greece and Rome. The fall of Constantinople, in 1453, filled the Italian cities with these learned strangers. At this period the Italians required only to receive some kind of direction, and to be provided with the means of study. They had for some time been placed in those peculiar circumstances which have almost always proved favourable to the advancement of the human mind. A number of independent states were crowded upon a narrow space, throughout which the same language, diversified by dialects, prevailed, exhibiting, in a sort of reflected or secondary form, that of ancient Italy; whilst the formation of libraries, suggested or favoured by the importation of manuscripts from Constantinople, proved the means not only of making more widely known the works of the Greek authors (which had never fallen into oblivion), but of prompting those researches which issued in the recovery of the Latin writers, many of whom had long been forgotten. The appetite for books being thus revived and quickened, neither labour nor expense was spared in accumulating them; learned men were despatched in all directions throughout Europe, Western Asia, and Africa, to collect manuscripts; and, in the course of a few years, most of the authors now known were brought together in the libraries of Rome, Naples, Venice, Florence, Vienna, and Paris. Aided by the munificence of princes and popes, the scholars of the fifteenth century applied themselves to the discovery, restoration, and publication of the remains of Greek and Roman literature; and, in the course of sixty or eighty years, most of the works now known were committed to the press. Since that time additional discoveries have been made; but the principal improvements of a subsequent date have consisted in the emendation of the text of ancient authors, partly by a more extensive collation of manuscripts than the first editors possessed the means of instituting, and partly also by the lights and aids of a cautious and judicious criticism.¹

The invention of printing, by virtually exempting books from the operation of the law which subjects all human things to decay, has also greatly promoted the process of their renovation. By giving to the issue of an edition of a standard work a degree of importance several hundred times greater than that which belonged to the transcription of a single copy, it has called for a proportionally larger amount of learning, diligence, and caution, in the work of revision; and, by enabling each successive editor to avail himself of the labours of his predecessors, all the advantages resulting from the concentration of many minds upon the same subject have further been secured. Since the fifteenth century, therefore, the lapse of time, instead of gradually impairing and corrupting the literary remains of antiquity, has incessantly contributed to their renovation; what was then unknown or doubtful, imperfect or corrupted, has been ascertained, restored, and completed; and the learning and industry of the four centuries which have since elapsed, being constantly directed towards the same objects, have left comparatively few questions of literary antiquity open to controversy.

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dle ages.

Several of the great libraries of Europe date their first beginnings during the hundred years between 1365, when Charles V. of France had already won renown as a collector of choice manuscripts, and 1463, when the art of printing had established itself, without having as yet materially interrupted the labours of the copyists. Within this period are included the foundation of the Imperial Libraries of Paris and of Vienna, of the Laurentian Library at Florence, and of the Library of the Vatican; and the liberal gifts of books which were made by Sir Richard Whittington to the Franciscans of London; by Humphrey, Duke of Gloucester, to the University of Oxford; by King Henry VI. to All Souls College; and by Niccolò Niccoli to his fellow-citizens of Florence. It also witnessed the commencement of those splendid collections of Frederick, Duke of Urbino, and of Matthias Corvinus, King of Hungary, which eclipsed all preceding libraries, and were counted amongst the marvels of the age. But, unfortunately, whilst the Urbino Library has escaped the almost total destruction which befel that of Corvinus, it has lost much of its value by division. Its manuscripts are still conspicuous amongst the treasures of the Vatican, but they are less accessible to students than they were in the romantic seat of the old dukes; and the printed books are scattered, some being at Castel Durante, others in the Library of the "Sapienza" at Rome, and others, again, still remaining at Urbino.²

Within the same period, too, is comprised the foundation of the oldest of those town libraries in which Germany has become rich. As early as 1413, Andreas von Slomnow established a library at Dantzic in connection with the church of St Mary.³ His example was followed by Conrad von Hildesheim at Ratisbon in 1430;⁴ by Heinrich Neidhart at Ulm in 1440;⁵ and by Conrad Kühnhofer at Nuremberg in 1445.⁶ Nor was France far behind in a similar foundation, although in that country the first step was not followed up with equal vigour. There is an account of the purchase of books for a public library by the Common Council of Aix in the year 1419.⁷ For any such record, or for any entry at all respecting such an institution, in the proceedings of an English municipality, it will, we fear, be necessary to descend almost two centuries. The striking contrast which for many generations existed between Great Britain and some of the continental states, as respects the possession of libraries publicly accessible, was none the less, but rather the more, deplorable for the fact that in earlier days it had been, as there is good hope that in future days it will yet be, quite otherwise. In that first "revival of letters" for which the Europe of the middle ages was so greatly indebted to the genius and energy of Charlemagne, we find Alcuin writing to his imperial patron, that nothing so wrought within him a longing to return to England as the memory of the books which there had abounded, and of which in France there were so few. He repeatedly urges the Emperor to send messengers to England for manuscripts. So highly were those prized which he had himself brought with him to the court, that they became the foundation of a special school of scribes and illuminators in the country round Aix-la-Chapelle, which for many ages, it is said, remained faithful to Saxon traditions.

More than five centuries later we find the patron saint of British book-lovers, Richard Aungerville, Bishop of Durham, in the midst of his lamentations at the degeneracy of morals, and at the supremacy of the lust of power and gain

¹ Taylor, *Hist. of the Transm. of Ancient Books*, p. 106. "This restoration," continues Mr Taylor, "of the remains of ancient works to their pristine integrity, has not been effected like that of a dilapidated building or mutilated statue, by the addition of new materials in an imagined conformity with the plan and taste of the original work, but by the industrious collection and replacement of the very particles of which it first consisted."

² Dennistoun, *Mémoires of the Dukes of Urbino*, vol. iii., pp. 228-232.

³ Petzholdt, *Handbuch deutscher Bibliotheken* (Halle, 1853, 12mo), pp. 78, 79.

⁴ *Serapeum* (Leipsic, 1844, 8vo), vol. v., pp. 193-202.

⁵ Rouard, *Notice sur la Bibliothèque d'Aix* (Aix, 1831, 8vo), p. 40. See also Pitton, *Histoire d'Aix*, p. 591.

⁶ *Ibid.*, p. 314.

⁷ Petzholdt, *ut sup.*, p. 280.

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over the old love of knowledge, bursting into a cry of triumph at the apparent dawn of a brighter day. He quaintly recalls, indeed, the almost tumultuous pleasure with which, in his youth, he used frequently to visit "Paris, the paradise of the world! . . . where are delightful libraries in cells redolent of aromatics, . . . flourishing green-houses filled with all sorts of volumes, . . ." but thinks there are already indications, that as "the admirable Minerva once deserted Athens, and then retired from Rome, she has, in like manner, given the slip to the Parisians, and has at last happily reached Britain, the most renowned of islands."¹

The good bishop practised what he taught. He is the first recorded donor of books to the University of Oxford. His example was followed by several other prelates and eminent personages; but all these benefactions were destroyed in the stormy days of the Reformation. Perhaps of all the incidental losses that were swallowed up, if we may so speak, in that great gain, there was none more deserving of regret than the loss of a precious opportunity for adding literary to religious reform. Many of those who most hated monkish corruptions have borne striking testimony to the worth of monastic libraries, even after long years of neglect and injury. That stern opponent of the Romanists, Bishop Bale, for example, keenly laments that in "turning over the superstitious monasteries so little respect was had to the libraries, for the safeguard of those noble and precious monuments. . . . Avarice was the . . . dispatcher which made an end both of our libraries and books, unto the no small decay of the commonwealth." And then he adds, in glowing words, that expression of deep regret that so favourable an occasion had not been seized for the establishment of *county libraries* throughout England, to which we have elsewhere adverted, and concludes thus:—"But to destroy all without consideration is, and will be, unto England for ever, a most horrible infamy among the grave seniors of other nations."²

It was not until the reign of James I. that Great Britain could boast even a "Royal Library" worthy of the name. In 1570 Sir Humphrey Gilbert had vainly pressed on the attention of Queen Elizabeth the superior advantages which men of letters enjoyed in other countries, and the national glory which would result from the establishment of a royal academy and library upon an adequate scale. But what the monarch failed to do was in process of time undertaken by some private persons. In 1580 Clement Littill laid the corner-stone of the Library of the University of Edinburgh. In or about 1588, Sir Robert Cotton commenced that noble collection of manuscripts which long afterwards was to become not the least fruitful germ of our National Museum. In 1597 Sir Thomas Bodley resolved (to use his own words) "to take his full farewell of all state employments, . . . and to set up his staff at the library door in Oxon."³ And, in 1601, a most worthy, though unusual, memorial of military gratitude, laid the foundation of the fine Library of Trinity College, Dublin.

Our historical summary of the growth and fortunes of these and of some others of the more conspicuous European libraries must needs be a brief one. We arrange it under the main divisions of (1.) *British*, (2.) *Foreign*, (3.) *American* and *Colonial* collections, and begin with those which are of nearest interest.

(1.) BRITISH LIBRARIES.

Library of
the British
Museum.

The Library of the British Museum, which is now deservedly considered as the great national depository of science, literature, art, and antiquities, has been composed of

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various collections successively obtained, and is not more remarkable for its numerous and valuable manuscript acquisitions than it is for that energy in its recent management, which within a few years has raised the collection of printed books, from a position comparatively mean, to one of—to say the least—substantial equality, with the oldest and most favoured of the great collections of Europe.

The Museum owes its immediate origin to the bequest of Sir Hans Sloane, whose collections were purchased agreeably to the terms proposed, in the name of trustees, for the public use. The department of printed books consisted originally of Sloane's Library, which was increased by other collections, including manuscripts of the highest importance. In 1757, George II., by an instrument under the Great Seal, added the Library of the Kings of England, the printed books of which had been slowly collected from the time of Henry VII., and the manuscripts from a much earlier date, to be afterwards mentioned. This collection was very rich in the prevailing literature of different periods; and it included, amongst others, the Libraries of Archbishop Cranmer, of Henry Prince of Wales, and of Isaac Casaubon. His Majesty annexed to his gift the privilege which the Royal Library had long possessed, of being supplied with a copy of every publication entered at Stationers' Hall. The same department was further enriched, in 1763, by a donation from George III. of an extraordinary collection of pamphlets and periodical papers (published in England between 1640 and 1660, and chiefly illustrative of the civil wars in the time of Charles I.), which had been formed by Geo. Thomason, a royalist bookseller in London. These tracts include a most extensive and singular series of ephemeral productions on various subjects, and amount, in the aggregate, to 2220 volumes, containing about 34,000 separate publications or articles. Many of them are single leaves, or broadsides, with woodcuts and portraits; and their value is enhanced in having the dates of publication written on each, and sometimes their prices. That the old Royal Library, which had been under the charge of some of the most learned men in England, should not have been preserved entire, and kept as a distinct portion of the Museum, is matter of serious regret. But, by ill-advised economy, the books were not even always preserved, but many of them, from time to time, sold as duplicates, notwithstanding the interest attaching to dedication copies to different monarchs, and to the splendid and curious bindings of the time, ornamented with the royal arms and cyphers.

It would be vain to attempt a detailed enumeration of all the additions which have since been made, whether by gift or by purchase. Amongst the smaller acquisitions may be mentioned Dr Thomas Birch's library; two collections of books on musical science from Sir John Hawkins, and one from Dr Charles Burney; Garrick's collection of old English plays; numerous classics from the library of Thomas Tyrwhitt, with his manuscript notes; Sir William Musgrave's collection of biography; a collection of classics, enriched with Dr Bentley's manuscript notes; a library of ceremonials, processions, and heraldry, from Mrs Sophia Sarah Banks; and a collection of Italian history and topography, from Sir Richard Colt Hoare. Amongst the larger and more important are, the general library collected by the Rev. Clayton Mordaunt Cracherode, consisting of books of great rarity, and in the finest condition; the law library of Mr Francis Hargrave; the library of science which belonged to the Baron von Moll of Munich; the libraries of M. Ginguené, author of the *Histoire Littéraire d'Italie*, and of the Rev. Dr Charles Burney; and Sir Joseph Banks's library of natural history. Four separate collections of tracts, illustrative of the revolutionary history

¹ *Philobiblon* (Inglish' version), pp. 53–66.

² Bale's Preface to Leland's *New Year's Gift to King Henry VIII.*, ut *supra*.

³ *Reliquiæ Bodleianæ*, p. 13.

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of France, have been purchased at different times by the trustees, in the exercise of the powers with which they are invested. One of these is the collection formed by the last president of the parliament of Brittany, at the commencement of the revolution; two others extend generally throughout the whole revolutionary period; and the fourth consists of a collection of tracts published during the reign of the Hundred Days in 1815; forming altogether a body of materials for the history of the revolution as complete in regard to France, as the collection of pamphlets and tracts already mentioned is with respect to that of the civil wars of England in the time of Charles I. Another feature of the Museum Library is its progressive collection of newspapers from the first appearance of these publications, early in the seventeenth century.¹ Sir Hans Sloane had formed a great collection for his day. But to this was added, in 1818, the Burney collection, purchased at the estimated value of L.1000; and, during a long time past, the Commissioners of Stamps have continued periodically to forward to the Museum copies of all newspapers deposited by the publishers in their office.

King's
collection.

In 1823 the Royal Library collected by George III. was presented to the British nation by his successor, George IV., and ordered by parliament to be added to the library of the British Museum, but to be kept for ever separate from the other books in that institution.² The general plan of its formation appears to have been determined on by George III. soon after his accession to the throne; and the first extensive purchase made for it was that of the library of Mr Joseph Smith, British consul at Venice, in 1762, for which his Majesty paid about L.10,000. In this purchase was included the chief portion of a very extensive and valuable series of drawings and engravings, to be afterwards mentioned, which formed a separate and interesting division of the royal library. In 1768, Mr (afterwards Sir Frederick) Barnard, the librarian, was despatched to the Continent by his Majesty; and, as the Jesuits' houses were then being suppressed, and their libraries sold throughout Europe, he was enabled to purchase, upon the most advantageous terms, a great number of valuable books, including some very remarkable rarities in France, in Italy, and in Germany. The entire collection was formed and arranged under the judicious direction of Mr Barnard, assisted by Mr George Nicol, bookseller to his Majesty for upwards of half a century. Many of the rarest books were secured by him for the collection, at the sale of West's, and other libraries. In addition to the purchase of Consul Smith's books, there remained, as the nucleus of the library, those of Charles II., and subsequent monarchs, chiefly presentation and large-paper copies, which were not included in the previous gift of George II. to the Museum. It may also be noticed, as a matter of regret, that a few of the more remarkable volumes were retained by George IV. We know of at least four books that were specially withheld when the library was transferred to the Museum in 1823. One of these is a splendid copy, the finest, perhaps, in existence, of the *Psalterium*, from the press of Fust and Schœffer, in the year 1457, being the earliest book known with a date. It is superbly bound in garter-blue velvet, having on the sides the royal crown and cypher in solid gold, with embossed gold corners and clasps. The second is *The Doctrinal of Sapience*, the only book known to have been printed by Caxton on vellum. A third volume is the *Shakspeare*, second edition, of 1632, of no great rarity, but

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remarkable in having been presented to Sir Thomas Herbert by Charles I., with the king's autograph and his favourite motto, *Dum spiro spero*. A fourth volume is that rarest of the Aldine *Virgils*, a copy of the edition of 1505. These volumes are now preserved in the Royal Library at Windsor. There was likewise retained, and is now deposited at Windsor, a very extensive and important collection of drawings and sketches by the old masters, arranged and bound in volumes, among which are numerous drawings by Leonardo Da Vinci, Raffaele, Michael Angelo, the Caracci, Guercino, Claude Lorraine, Nicolas Poussin, and others. A selection of these in facsimile was engraved and published by Chamberlaine, 1797, large folio. Here, also, are those beautiful and masterly portrait-drawings of illustrious persons in the court of Henry VIII., by Holbein, of which Chamberlaine's imitations are so well known. The Royal Library was fed, during a period of sixty years, by an annual expenditure of about L.2000; and it is in itself perhaps one of the most complete libraries of its extent that was ever formed. It contains selections of the rarest kind, especially of scarce books which appeared in the first ages of the art of printing; in particular, it boasts of nearly forty volumes printed by Caxton, a larger number than can be found in any other library, with the exception of Earl Spencer's. It is also rich in early editions of the classics, in English history, and in Italian, French, and Spanish literature; and there is likewise a very extensive collection of geography and topography, and of the Transactions of learned academies. The number of volumes in this library is 65,250, exclusive of a valuable assortment of pamphlets—about 19,000 in number—and it appears to have cost, in direct outlay, about L.130,000. When the King's Library was added to that which previously belonged to the Museum, the number of duplicate volumes in the two collections was found to be about 21,000 volumes, of which the committee of the House of Commons recommended that not more than 12,000 should be parted with; and hence, by the gift of George IV., a clear addition was made to the National Library of more than 50,000 volumes.

Another most important addition to the library of the Grenville Museum was the bequest of the Right Hon. Thomas Grenville, in 1846. It consists of 20,240 volumes, and cost upwards of L.54,000. The books are arranged in a separate apartment; and for rarity, judicious selection, and beauty of condition, and for the number of copies of books on large paper, it is equal to any collection of the same extent that could be named. Among many choice treasures that might be specified, we may mention the *Mentz Latin Bible* (usually known as the *Mazarine Bible*), by Guttenberg, circa 1455, 2 vols., on vellum; the unique copy, on vellum, of the first edition of *Livy*, by Sweynheim and Pannartz, 1469;³ that of the first edition of *Ovid*, by Azzoguidi; a copy of the Aldine *Virgil* of 1505; a splendid set of De Bry's *Voyages*; an uncut copy of Purchas's *Pilgrims*; a first *Shakspeare*, 1623, one of the finest known; and a remarkable series of early editions of the *Orlando Furioso*. The Grenville collection was not actually deposited in the Museum until 1847. During that year was also added, by the Secretary of State for Foreign Affairs, a very extensive series of Chinese books, which had been collected by Robert Morrison, Esq. of Canton. It contains 476 distinct works, in 11,509 volumes, and is especially rich in the history and politics of China.⁴ The other most noticeable additions of recent years have been,—(1.) The collection of Hebrew

¹ The celebrated *Armada* newspaper of 1588 is now acknowledged to be a forgery, and few forgeries have been so long successful. The honour of its detection is due to Mr Thomas Watts, of the British Museum. Who was the forger can but be conjectured. The papers were elaborately concocted, and were found—partly in print and partly in manuscript—amongst the collections of Dr Thomas Birch.

² Report of the Select Committee of the House of Commons on the Royal Library, 18th April 1823.

³ This volume was purchased at Mr Edwards' sale, in 1815, for 860 guineas.

⁴ Parliamentary Return of 3d March 1848 (Sess. Paper, 139).

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literature formed by Dr Michael of Hamburg (who died in 1846), extending to 3970 distinct works, in 4420 volumes. This library included about 400 Bibles and Commentaries; 860 scientific works; a series of documents illustrative of the history of the Jews before and after their expulsion from Spain, and several fine specimens of early printing from the presses of Lisbon, Soncino, and Naples;¹ and, (2.) a vast and systematic selection of books in every department of literature and in all languages, chosen with express reference to the previous deficiencies of the library, as they were ascertained on a careful survey in 1843, and described in Mr Panizzi's elaborate Report of the 1st January 1845, which was subsequently printed amongst the Parliamentary papers of that year.

The aggregate of the collections, the most conspicuous of which we have thus enumerated, augmented by many minor gifts, by claims, now strictly enforced, under the Copyright Acts, and occasionally by liberal grants of Parliament for purchases, have placed the library of printed books in the British Museum on a level with the most famous European collections, and, perhaps, second only—even in point of numbers—to that of the Imperial Library at Paris. The average yearly additions amount to about 13,000 volumes; and the entire library is reckoned to contain 562,000 volumes. When Mr Panizzi, now principal librarian, became keeper of the printed books in 1837, the number of volumes was barely 240,000; so that (exclusively of the bequest of Mr Grenville), 300,000 volumes have been acquired, arranged, catalogued, and made accessible to readers, under the official rule, and mainly by the strenuous exertions of one keeper, and that, during a term of office which, compared with many official periods, marked by no such acquisitions, may almost be designated a brief one. Nor is this all. Within the same period the whole of the old library—the royal collection alone excepted—has been removed from its former habitation, subjected to an arrangement entirely new, and, to a considerable extent, has been re-catalogued, without any noticeable interruption of its public use. Assuredly, in the entire history of libraries, we meet with no parallel to these achievements; and to them will soon be added another claim to the gratitude of students, in the provision of a reading-room on a scale of unequalled magnitude, with appliances worthy of the library, the public utility of which they are designed to extend.

Depart-
ment of
manu-
scripts.

The *Department of Manuscripts* in the British Museum is not less valuable and important. It embraces several distinct collections, of which the first to be noticed is,—(1.) The *Royal* collection. This contains about 1950 volumes, which formed the other portion of the ancient Royal Library of England, presented to the nation by George II., in 1757. These manuscripts date from the reign of Richard III. to that of Charles II., and are described in a catalogue by David Casley, printed in 1734 (of which an enlarged and corrected edition is much wanted). Among these precious manuscripts, one of the most remarkable is the *Codex Alexandrinus*, a present from Cyril, Patriarch of Constantinople, to King Charles I. It is in four quarto volumes, written upon fine vellum, in uncial characters, probably between the fourth and sixth centuries, and is believed to be the most ancient manuscript of the Greek Bible now extant. Many of the other manuscripts came into the royal collection at the time when the monastic institutions of Britain were destroyed; and some of them still retain upon their spare leaves the honest and hearty anathemas which the donors denounced against those who should alienate or remove the respective volumes from the places in which they had been originally deposited. This collection abounds in old scholastic divinity, and possesses many volumes, embel-

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lished by the most expert illuminators of different countries, in a succession of periods down to the sixteenth century. In it are also preserved an assemblage of the domestic music-books of Henry VIII., and the *Book of Doron* of James I., in his own handwriting. It also contains several chronicles and other volumes, which appear to have been executed for Edward IV.; a volume of French romances, presented by Talbot, Earl of Shrewsbury, to Queen Margaret of Anjou, and others richly illuminated. (2.) The *Cottonian* collection, which was purchased for the use of the public in 1700, and annexed by statute to the British Museum in 1753, is especially rich in historical documents, from the time of the Saxons to that of James I. These MSS., to the number of 958 volumes, had been collected by Sir Robert Cotton, who was born in 1570, and died in 1634. Subsequently to this acquisition for the nation, a fire, on the 23d October 1731, broke out in Ashburnham House, where these MSS. were then deposited, when serious losses were sustained. From the detailed "Report from the Committee appointed to view the Cottonian Library," &c., printed by order of the House of Commons (1732, folio), we learn that "114 volumes were either lost, burnt, or entirely spoiled, and 98 others damaged, so as to be defective; so that the said library at present consists of 746 entire volumes, and 98 defective ones." Within these few years, a considerable number of the burnt fragments and damaged MSS. have been most skilfully restored. The Cottonian Library likewise contains numerous registers of English monasteries; the charters of Edgar and of Henry I. to Hyde Abbey, near Winchester, written in gold letters; and the manuscript called the *Durham Book*, being a copy of the Latin Gospels, with an interlinear Saxon gloss, written before the year 800, illuminated in the most elaborate style of the Anglo-Saxons, and reputed to have once belonged to the Venerable Beda. This collection is also rich in ancient charters, and in royal and other original letters and state papers, and comprises the correspondence of most of the great personages, not only of this country, but throughout Europe, from the earliest periods at which letters were written until the commencement of the seventeenth century. (3.) The *Harleian* collection, formed by Robert Harley, Earl of Oxford (1661–1724), was purchased in 1753 for £10,000. It contains 7639 volumes, exclusive of 14,236 original rolls, charters, and other deeds. Although somewhat miscellaneous in its character, historical literature in all its branches forms one of its principal features. It is particularly rich in heraldic and genealogical manuscripts; in the visitations of counties, and in English topographical collections; in parliamentary and legal proceedings; in originals, copies, and calendars of ancient records; in abbey registers; in manuscripts of the classics, amongst which is one of the earliest known of the *Odyssey* of Homer; in missals, antiphonaries, and other service-books of the Roman Catholic Church; and in ancient English poetry. It possesses two very early copies of the Latin Gospels, written in gold letters; and also contains a large number of splendidly illuminated manuscripts, besides an extensive mass of correspondence. It further includes about 300 manuscript Bibles or biblical books, in Hebrew, Chaldaic, Greek, Arabic, and Latin; nearly 200 volumes of writings of the Fathers of the Church; and many works on the arts and sciences, amongst which is a tract on the steam-engine, with plans, diagrams, and calculations, by Sir Samuel Morland. (4.) The *Sloane* collection, to the extent of 4100 volumes, consists principally of manuscripts on natural history, voyages and travels, works on the arts, and especially on medicine. It comprises the chief of Kæmpfer's manuscripts, with a portion of the voluminous medical collections of Mayerne, including the annals of his practice at the court

¹ Parliamentary Return of 20th March 1849 (Sess. Paper, 140).

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of England from 1611 to 1649; and it also contains 30 volumes of Dr Sloane's correspondence, and a considerable collection of medical and other scientific documents, with numerous manuscripts on history, poetry, and miscellaneous subjects. Some of the drawings of animals in this collection are exceedingly rich and accurate; two volumes upon vellum, are from the pencil of Madame Merian; and one relates entirely to the insects of Surinam. (5.) In 1807 the collection of manuscripts formed by the first *Marquis of Lansdowne* was added to these libraries, having been purchased by parliament for L.4925. It is divided into two parts; the first consisting of 121 volumes of the very important state papers and correspondence of William Lord Burghley, during the long reign of Queen Elizabeth; in the second there are more than 50 volumes of the papers and letters of Sir Julius Cæsar, Judge of the Admiralty, and Master of the Rolls; the collections, in 107 volumes, of Dr White Kennet, Bishop of Peterborough; several ecclesiastical registers of English priories; the correspondence of Henry Cromwell, as Chief Governor of Ireland; various ancient English chronicles; and numerous other historical, genealogical and topographical manuscripts of great importance. Amongst the minor volumes is a manuscript of Hardyng's *Chronicle*, presented by the author to King Henry VI.; a French version of the sacred Scriptures upon vellum; five volumes of Saxon homilies; and a facsimile of the Vatican *Virgil*, executed by Bartoli in 1742. To these may be added, a Chinese map, and nearly two hundred drawings, in the first style of eastern art, representing the dresses, customs, and natural history of the interior of China. (6.) Another large collection of manuscripts, about 500 volumes, almost exclusively belonging to the faculty of law, was purchased in 1813, of the representatives of *Francis Hargrave*, and cost L.8000. Amongst these, besides numerous copies of early reports, is an abridgment of equity, in 43 volumes, by Sir Thomas Sewell, Master of the Rolls. (7.) The collection of manuscripts, amounting to 520 volumes, chiefly of the Greek and Latin classics, which had been formed at a vast expense by the *Rev. Dr Charles Burney*, was purchased in 1818. Amongst these is the *Towneley Homer*, a manuscript of the *Iliad*, similar to that of the *Odyssey* in the Harleian collection;¹ two early manuscripts of the Greek rhetoricians; a volume of the mathematical tracts of Pappus; and a Greek manuscript of Ptolemy's *Geography*, adorned with maps of the fifteenth century. (8.) Two Oriental collections have also been added. One of these, made by Mr C. J. Rich, whilst British Consul at Baghdad, and purchased by parliament in 1825, contains, amongst other rare manuscripts, several copies of the Syriac version of the Scriptures, which are believed to be of great antiquity. The other, a collection made in different countries of the East, and consisting chiefly of Arabic and Persian manuscripts, was bequeathed to the Museum in the year 1827, by the collector, Mr J. F. Hull. (9.) In 1829 a small but valuable collection of manuscripts, partly relating to French history, and partly of a literary character, was bequeathed to the Museum by the last *Earl of Bridgewater*, accompanied by a small real estate, and a sum of L.5000 to be invested, and the proceeds, as they became available, applied in the purchase and binding of manuscripts. A further sum of L.7000 was bequeathed to the intent, that the interest thence accruing should be paid to the librarian or librarians having charge of the collection. In 1838 this "Egerton Fund" was largely increased by the bequest of L.2872, three per cent. consols, by the late Lord Farnborough, expressly as an addition to it, for further purchases of MSS. (10.) The last distinct collection is that of the *Howard-Arundel* manuscripts, acquired from the

Royal Society in 1831, partly by exchange, and partly by purchase, at an estimated value of L.3560. It consists of more than 600 volumes, contains many manuscripts of interest in almost every branch of learning, and is rich in materials for the history of our own country and language. The ancient rolls and charters of the Museum, many thousands in number, form another division of the department of manuscripts, with a distinct catalogue. These records and deeds partly belong to the Cottonian, Harleian, and Sloane collections, and partly are accumulated additions, being chiefly illustrative of English history, and of monastic and other possessions.

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These are the larger and separate collections. The Additional Manuscripts, as they are called, consist of smaller collections, which have either been acquired by purchase, or are the gifts or bequests of individuals. Amongst these may be specified, Madox's collections for the History of the Exchequer, 94 vols.; Rymer's materials for his *Fædera*, used and unused, 58 vols.; Dr Birch's historical and biographical manuscripts, 378 vols.; the decisions of the judges upon claims made in the city of London after the great fire of 1666; Sir William Musgrave's obituary; Cole's collections for a History of Cambridge and Cambridgeshire, with materials for the *Athenæ Cantabrigienses*, 92 vols.; various Coptic and other ancient manuscripts taken from the French in Egypt; Ducarel's abstracts of the archiepiscopal registers at Lambeth, 152 vols.; a long series of calendars of the *Originalia* Rolls, from 1 Henry VIII. to 2 James I.; Sir Andrew Mitchell's diplomatic correspondence with every part of Europe during his residence at the court of Frederick the Great of Prussia; Sir William Burrell's and Mr William Hayley's joint collections for the History of Sussex, 41 vols.; Mrs Banks's manuscripts on heraldry, processions, and archery, 66 vols.; Abbot's drawings and descriptions of American insects, in 17 vols. 4to; Wolley's collections for Derbyshire, 53 vols.; Sir Joseph Banks's foreign correspondence; Essex's and Kerich's collections on Gothic architecture and costumes, 49 vols.; the Stepney papers; the papers of the Count de Puisaye, chiefly relating to the Chouan war and the Royalists of La Vendée, from 1793 to 1825, in 117 vols.; the Jermyn collections for a History of Suffolk, in 51 vols.; and the still richer collections on the same subject, extending to about 160 volumes, of the late Mr Davy of Ufford; the materials collected by Archdeacon Cox, whilst employed in the compilation of his various historical and other works, in 206 vols.; numerous manuscripts, being 604 vols., illustrative of Italian history, selected from the collection of the Earl of Guilford; 310 rolls, commonly known as the Chancellor's Rolls, being duplicates of the great Rolls of the Pipe, between 9 Henry II. and 17 James I.; the smaller King's collection, being 440 vols., which formed part of the Library of George III.; the topographical collections of Samuel and Daniel Lysons, being chiefly materials for the *Magna Britannia* and *Environs of London*, 64 vols.; Egyptian Papyri, partly purchased from Mr Salt and others, and partly presented by Sir J. G. Wilkinson; an extensive collection of ancient Irish manuscripts, including copies of the Brehon Laws; a selection, made at an expense of more than L.2000, from the manuscripts possessed by Mr Richard Heber; and the voluminous Indian correspondence of the Marquis of Wellesley, from 1798 to 1805, in 1351 vols. A general enumeration of these additional manuscripts will be found in a useful volume, by Mr Richard Sims, of the Department of Manuscripts, entitled *Handbook to the Library of the British Museum* (1854, 12mo). But valuable accessions continue to be made; and at present the entire number of manuscripts, exclusive of original deeds and charters,

¹ This manuscript was purchased by Dr Burney, at the price of 600 guineas.

British amounts to nearly 40,000. Among the more important additions of the last few years, besides a series of royal and other letters, from the library of Mr Dawson Turner of Yarmouth, we may notice the splendid Bible, in two vols., of Charlemagne; the celebrated Bedford Missal, executed for John, Duke of Bedford, Regent of France under Henry VI. (which was formerly in the Harleian collection, and is now restored to it, after passing through many hands); a valuable and extensive collection of documents, illustrative of the Civil War period; the correspondence and other papers relating to the captivity of Napoleon at St Helena; and a remarkable series of papers of the Florentine family of Gualterio, extending to about 400 vols., and rich in materials for Italian history during the last century.

But no accession to this department, of recent date, can vie in interest with those venerable fragments of antiquity, which have been brought from the Nitrian desert, mainly by the zealous researches of Mr Archdeacon Tattam, and of which such excellent use has already been made by the learned author of the *Corpus Ignatianum* [IGNATIUS]. The grotesque custodians of these Syriac MSS. have been described with more than photographic vividness by Mr Curzon, and his pictures of his own experiences in the search of books, enhance our surprise that so much has been recovered. Three several consignments of MSS. from Nitria have reached the Museum since the beginning of 1843, amounting in the whole to about 600 vols. Some of these contain several distinct works, but a considerable proportion of them are more or less imperfect. It has, however, repeatedly happened, that portions of the same work have been received at different times. Probably the entire collection contains, either in works or fragments of works, not less than 1200 distinct MSS., of which the earliest are at least as old as the beginning of the fifth century, and the latest are of the beginning of the fourteenth. Amongst them are some of the oldest Biblical MSS. in existence. There is a copy of the Pentateuch, for instance, dated 464. There are nearly 30 vols. which contain various books of the Old Testament in the Peshito version, and more than 40 containing portions of the New Testament in the same version—many of them of the sixth century. Of liturgical and patristic works there are great numbers,—some of them palimpsest,—and of early and curious contributions to ecclesiastical history, not a few.¹

The catalogues of the *Printed Books* are in two series; first, the printed catalogue of 1813-1819, in 7 vols. 8vo. In the reading-room of the Museum for consultation, is a copy of this catalogue, inlaid and interleaved with manuscript additions, between the years 1819 and 1849, in 82 vols. folio. Another catalogue, still in progress, contains the subsequent additions, and extends to upwards of 300 volumes in folio. There are other special catalogues, such as of music, pamphlets, &c. The general printed catalogue, commenced in 1841, by Mr Panizzi, as yet embraces letter A only, and does not include books acquired since the close of the year 1838. An interleaved copy, with additions, is bound in 16 vols. Of the library of George III. there is a printed catalogue, 1820-1829, 5 vols. imperial folio. There is likewise a catalogue of the geographical and topographical collection attached to the library of George III., printed in one vol. folio, to match the general catalogue of this library, and also in two vols. 8vo, 1834. Of the Grenville Library, there is an excellent descriptive catalogue, the first portion prepared under Mr Grenville's own direction. It

forms 3 vols. 8vo, 1842-48. All the catalogues are alphabetical; and there is yet no general classed catalogue, although a sum considerably exceeding L.5000 was paid many years ago by parliamentary grants as "expenditure on account of a classed catalogue."² The absence of a complete catalogue, in a printed form, either classed or alphabetical, of a library such as that of the Museum, is undeniably a public inconvenience. "As are the catalogues of a library, so will be its utility,"³ is an old and true adage. No skill or industry can make a catalogue in MS. fully supply the place of one in print; and we cannot doubt that the energy which has already done so much, will in due time confer on students and on the public at large this advantage also. The printed catalogues of the *Manuscripts* are,—1. That of the manuscripts of the old Royal Library, by David Casley, 1734, in 4to; 2. That of the Sloane and other manuscripts, heretofore undescribed, by S. Ayscough, 1782, in 2 vols. 4to; 3. That of the Cottonian manuscripts, by Joseph Planta, 1802, in folio; 4. That of the Harleian manuscripts, by H. Wanley and R. Nares, 1808, in 4 vols. folio; 5. That of the Hargrave manuscripts, by Sir H. Ellis, 1818, in 4to; 6. That of the Lansdowne manuscripts, by F. Douce and Sir H. Ellis, 1819, in folio; 7. That of the Arundel manuscripts, by the Rev. J. Forshall, 1840, in folio; 8. That of the Burney manuscripts, by the Rev. J. Forshall, 1840, in folio; 9. That of the Oriental manuscripts (by various authors), published between the years 1836 and 1852, in 6 vols. folio; 10. That of the Greek Papyri, 1839, 4to; and, 11. That of select Papyri, chiefly in the Hieratic character, 4 parts, folio, 1841-1844. Manuscript catalogues of the additions in the departments of printed books, and manuscripts to the latest time are kept in the Museum reading-room. There are also separate manuscript catalogues of the collection of tracts relating to the civil wars in the reign of Charles I.; of the Cole manuscripts; of the Chinese books; of the collections of printed musical works, maps, charts, &c.

The Library of the *Royal Society* consists chiefly of printed books of science and general literature, which may be consulted by all the fellows, and from which books may also be borrowed by them under the regulations prescribed by the statutes; nor have the Society, at any time that is remembered, ever refused to lend books or manuscripts to learned men not belonging to their corporation, who had occasion to consult them. The foundation of this library was laid in 1667, by the noble gift which John Evelyn induced Henry Howard, afterwards Duke of Norfolk, to make to the Society, "to dispose thereof as their property, desiring only that in case the Society should come to fail, it might return to Arundel House, and that this inscription, *Ex dono Henrici Howard Norfolciensis*, might be put upon every book given them." This Arundel Library included a considerable number of books which had formed part of the magnificent collection of Matthias Corvinus, already mentioned. Evelyn, whilst speaking of the choice treasures it contained, goes on to add: "I should not have persuaded the duke to part with these, had I not seen how negligent he was of them, suffering the priests and everybody to carry away and dispose of what they pleased, so that abundance of rare things are irrecoverably gone."⁴ Maitland, the historian of London, writing in or about 1755, tells us that, by a bequest of Mr Francis Aston, made in 1715, and by other additions, this library had already come to "excel all the public libraries of this city in point of goodness and value."⁵

¹ We have indicated but a small portion even of the most remarkable of these Syriac MSS. Probably the best general account of them is that published in vol. lxxvii. of the *Quarterly Review* (1845).

² *Minutes of Evidence before Select Committee on British Museum* (1835), pp. 134, 179.

³ C. G. Hevne, *Biographisch Dargestellt*, von A. H. L. Heeren, Göttingen, 1813.

⁴ *Diary and Correspondence of J. Evelyn*, vol. i., p. 471.

⁵ *History of London* (2d edit. by Entick), pp. 1286-1288.

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The number of volumes he states at 3625. It has now become about 41,000; and the collection is, as it ought to be, eminently rich in the literature of the mathematical and physical sciences. The transfer of the Arundel MSS. to the British Museum has been already adverted to. The titles of the books presented to the Society have been inserted at the end of the latter volumes of their *Transactions*. A carefully prepared catalogue of the scientific books was printed in 1839, 8vo, and another of the miscellaneous literature, manuscripts, and letters in 1841. There is also a catalogue in MS. of the maps, charts, drawings, and engravings, which exceed 5000 in number.¹ The Library of the *Royal Institution* was founded in 1803 by a few gentlemen, for the immediate use of the subscribers to that establishment; but any person may, upon the recommendation of a patron, always have access to it. This collection consists of nearly 27,000 volumes, including the best and most useful edition of almost every Greek and Roman classic, with the translations in English and other modern languages; the class of mathematical science in all its branches is very full, including the best scientific journals, and transactions of learned societies; and the historical department, founded on the collection of Mr Astle, which was purchased by the managers at the formation of the library, is, in its various divisions and subdivisions, exceedingly interesting. A catalogue, methodically arranged, with an alphabetical index of authors, by William Harris, was printed in 1809, in 8vo. Of this catalogue a second edition appeared in 1821, and a third in 1856. The Library of the *London Institution* was commenced in 1805, under the direction of Professor Porson, and has been admirably continued under the care, successively, of Mr Malby, of Mr Upcott, and Mr Richard Thomson. Next to that of topography, the departments of classical literature, mathematics, and history are the most amply stocked. It is also rich in bibliography, there being few works absolutely necessary to be consulted by the bibliographical student, which may not be found in this valuable collection.

Library of
the Royal
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braries in
London.

There is an excellent printed catalogue of this library, chiefly compiled by Mr Thomson, in 4 vols. 8vo; printed between the years 1835 and 1852.² The present number of volumes exceeds 60,000, and includes a fine series of tracts on a wide range of topics. Alike as respects compactness of arrangement and beauty of appearance, this library is a model which will repay careful study.

There are many other libraries in London worthy of notice, more especially the London (Subscription) Library, in St James's Square, established in 1841, and containing upwards of 65,000 volumes. A catalogue was published in 1853. Valuable Law Libraries are also connected with Lincoln's Inn, the Inner Temple, and the Middle Temple. The first-named collection contains 28,000 vols. of printed books and 900 MSS., and its earliest beginnings date from the year 1522. The Inner Temple Library contains upwards of 16,000 volumes of printed books, and about 500 MSS. The Middle Temple Library was founded by a bequest of Robert Ashley, Esq., in 1641. A century later it contained barely 4000 volumes, it now contains about 21,000 volumes. Of all these libraries printed catalogues

are extant. Sion College, London Wall, dates the foundation of its library in 1630,³ and contains upwards of 40,000 volumes; and, like Dr Daniel Williams' Library, in Redcross Street, founded in 1716, and opened in 1729, is rich in old English theology. Both collections are accessible to the public. That of Dr Williams, indeed, is open to all comers, and is the only one in London which is so unrestrictedly available. It contains between 20,000 and 21,000 volumes of printed books, and about 200 MSS.

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To John Williams, successively Bishop of Lincoln and Archbishop of York, is due the honour of having founded the first strictly public library in the English metropolis. "With strong propension of mind to enlarge the boundaries of learning," says his biographer, Bishop Hacket, "he converted a waste-room, situate in the east side of the cloisters, . . . into a goodly library, . . . and stored it with a vast number of learned volumes; for which use he lighted most fortunately upon the study of that learned gentleman, Mr Baker of Highgate, who . . . had collected the best authors in all sciences, in their best editions, which being bought at L.500, . . . were removed into this store-house [apparently in or about the year 1620]. When he received thanks from all the professors of learning in and about London . . . because they had free admittance, . . . it compelled him to unlock his cabinet of jewels and bring forth his choicest MSS. A right noble gift in all the books he gave to this *Serapeum*, but especially the parchments."⁴ The Cathedral Library of Westminster now contains 11,000 volumes;⁵ the foundation of Archbishop Williams having been liberally built upon by many succeeding benefactors. How choice a collection it is—despite some losses in the time of Charles I.—a glance at Mr Botfield's account of it will quickly show.⁶ And how suitable to its character is the habitation selected for it by the founder, may be seen in one of the charming word-pictures of Geoffrey Crayon.⁷ Books so valuable, and, if lost, so hard to be replaced, must needs be watched with careful eyes. But it is with regret we read the stringent official reply to the inquiries of the Cathedral Commissioners in 1854: "Accessible only to masters of the school, and to the Minor Canons."⁸

Nearly all the Deans and Chapters in England possess libraries of greater or less magnitude, and many of them are now liberally opened to the public under proper regulation. At St Paul's Cathedral, however, the rule is as briefly emphatic as at Westminster: "Accessible only to members of the Chapter," is the oracular response.⁹ This Library was founded by Henry Compton, Bishop of London, 1713; the old library of the Chapter having been scattered or alienated 60 years before, and part of it removed to Sion College. The Library, not having been very largely increased (there is no endowment), still carries in its aspect the impress of Bishop Compton's vigorous individuality. The number of volumes has been officially returned as 8000.¹⁰

The Cathedral Library of Durham is of almost equal value with that of Westminster, and is of somewhat larger extent, possessing about 11,000 printed volumes, besides 520 MSS. of considerable worth. It unites, with a portion of the old monastic library, the liberal benefactions of Dean

¹ Weld, *History of the Royal Society*, vol. ii., p. 474 (1848).

² This catalogue comprehends, first, a synoptical table of the classes; secondly, a plan of the arrangement, in classes, of the books themselves; thirdly, a general classed catalogue of all the books; fourthly, an index of authors' names and works; and, fifthly, an index of anonymous works, and of many different subjects, of which some account is to be found in the library.

³ *Repertorium Bibliographicum*, p. 93.

⁴ Hacket, *Scrinia reserata* (1693), p. 47. We have quoted this conclusive testimony with the more precision, since the very existence of this public Cathedral Library has been questioned in *Notes and Queries* for 1856.

⁵ *First Report of the Commissioners on Cathedral and Collegiate Churches* (1854), p. 37.

⁶ *Notices of Cathedral Libraries* (1849), pp. 433-464.

⁷ *The Sketch Book*, vol. i., pp. 227-229 (1823).

⁸ *First Report*, &c., *ubi supra*.

⁹ *Ibid*, p. 4.

¹⁰ *Ibid*.

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Sudbury, in the sixteenth century, and of the princely Bishop Cosin, in the seventeenth. It is so well kept up, that the printed books which Mr Botfield counted in 1848 to be 7259 volumes,¹ had increased in 1854 by nearly 4000 volumes; and is so liberally managed, that "it is accessible to all persons, without any distinction, religious or other, who are in such a position as to be deemed fairly responsible for the safe return of the books entrusted to them." At York, too, part of a more ancient library is combined with the bequests of the widow of Archbishop Matthew (1629), of Dr Fothergill, and of Dr Burgh. The collection is valuable, extends to about 8000 volumes, and is accessible to the public five days in the week. Canterbury and Exeter have each about 5000 volumes, and both collections include many books of the highest literary and antiquarian interest. With respect to Canterbury, there is a singular contrast between a statement on this point in the catalogue of 1802, and another made 30 years later, in reply to the inquiries of the Record Commission: "This Library . . . is rich in MS. materials relating to the civil and ecclesiastical history of the country," says the one.² "It is not believed that there is anything in the collection likely to be of the least public interest," says the other.³ Lincoln and Llandaff have each about 4500 volumes; Norwich, 4350; Ely, 4000; Worcester, 3600; Winchester, 3500; Carlisle, 3174. Most of the others range from 2000 to 3000 volumes; and many, even of the smallest of these ecclesiastical libraries, possess books of considerable value, which are not unfrequently the remnants of once splendid collections. It is undeniable that access to some of them has, in former times, been grossly abused, but there is evidence that the mischief has usually resulted, less from publicity than from want of proper regulations. At all events, it is certain that the strictest seclusion may be as destructive to books as the most lax use of them. That memorable cathedral library, whence certain jackdaws acquired "the expensive habit of using Anglo-Saxon MSS. to line their nests,"—as we have been lately told by a caustic Edinburgh Reviewer,—was assuredly not too public, although, in one sense, much too accessible.⁴

The Library of Printed Books, founded by Archbishop Bancroft in the reign of King James I., which, until recently, occupied the four galleries over the cloisters of Lambeth Palace, is now more worthily lodged in the noble hall built by Archbishop Juxon, and skilfully restored under the superintendence of Mr Blore. The number of volumes contained in this library is estimated at upwards of 25,000 manuscripts, many of which are of extreme rarity. In ecclesiastical history and in biblical literature, few collections contain so large a number of scarce and curious editions. The class of English topography is also extensive and valuable. The first catalogue of printed books was drawn up by Bishop Gibson; it was afterwards transcribed in a fair hand by Dr Wilkins, and has been continued by his successors in the librarianship to the present time. The manuscripts, many of which are extremely valuable, are arranged in seven sets or divisions, distinguished as *Codices Lambethiani*, *Whartoniani*, *Carewani*, *Tenisoniani*, *Gibsoniani*, *Miscellanei*, and *Suttoniani*. This department, besides being rich in copies of the sacred writings, contains Expositions of the Fathers of the Church; Missals, and Hours of the Holy Virgin; a number of papal bulls; vari-

ous treatises of Wycliffe; manuscripts relating to the history of France, and other European nations, particularly Spain, Italy, Poland, Germany, and Holland; 17 volumes in folio of the Shrewsbury correspondence; besides several letters to and from Charles II.; and certain manuscripts on heraldry and genealogy, written or corrected by Lord Burghley. But perhaps the two greatest curiosities in this collection are the ancient French version and exposition of the Apocalypse, ornamented with miniature paintings; and the Latin copy of the Apocalypse, also beautifully illuminated, which is supposed to have been written in the thirteenth century. A catalogue of these manuscript treasures, compiled by the Rev. H. J. Todd, the then keeper, was printed in 1812, in one volume folio, at the expense of the Archbishop of Canterbury.⁵ In two separate volumes, the Rev. S. R. Maitland has given a very accurate list of the earlier printed books (prior to 1550), and an index of the English books printed before the year 1600, in the Lambeth Library.

The different colleges of Oxford and Cambridge have Oxford libraries of various extent attached to them; but in each university there is at least one great or principal library, as the Bodleian Library at Oxford, and that of Trinity College, besides the Public, or University Library, at Cambridge.

The Bodleian Library, so called from the name of its Bodleian illustrious founder, was instituted towards the close of the library. reign of Elizabeth, by Sir Thomas Bodley, who, having become disgusted with some court intrigues, resigned all his employments about the year 1597, and immediately afterwards, as we have seen, undertook the generous task of restoring the public library at Oxford, which had been despoiled of its contents in the reign of Edward VI. With this view, he despatched from London a letter to the vice-chancellor, offering not only to restore the building, but to provide a fund for the purchase of books, and the maintenance of proper officers. This offer being thankfully accepted, he commenced his undertaking by presenting to the library a large collection of books purchased on the Continent, and valued at L.10,000. Other collections and contributions were also, by his example and persuasion, presented to the new library. The most important of these, perhaps, was a considerable portion of the very valuable library which had belonged to Jerome Osorius (who has been called the Cicero of Portugal), successively Bishop of Sylvas and of Algarve, in which last see he died in 1580. This library having been captured by the Earl of Essex, in the assault on Faro, in 1596, shortly after the expedition against Cadiz, part of it was by him presented to Bodley, in order to enrich the collection he was then forming.⁶ The additions thus made soon swelled to such an amount that the old building was no longer sufficient to contain them. The edifice was accordingly enlarged; and when Bodley had succeeded in enriching his collection beyond his most sanguine expectation, he drew up for its government a body of statutes, which were subsequently incorporated with those of the university. The Bodleian Library was first opened to the public on the 8th of November 1602; and has since found numerous benefactors, more especially Sir Robert Cotton; Sir Henry Saville; Archbishop Laud; John Selden; Sir Kenelm Digby; Thomas, Lord Fairfax; Dr

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¹ Botfield, *ut supra*, p. 91.

² Todd, *Catalogue of the Books, &c., of Christ Church, Canterbury* (1802), Preface.

³ Appendix to the *Report of the Commissioners on the Public Records* (1832).

⁴ *Edinburgh Review*, vol. xxvii., p. 165; art. "Cathedral Reform" (1853).

⁵ *Repertorium Bibliographicum*, p. 97.

⁶ Monson, *Account of the Wars with Spain*, p. 32. Sir William Monson was himself captain of the Earl's flag-ship in this expedition. "The only thing that was afterwards attempted," he says, "was Pharoah, a place of no resistance or wealth, only famous by the library of Osorius, who was bishop of that place; which library was brought into England by us, and many of the books bestowed upon the new erected library of Oxford."

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Thomas Barlow, Bishop of Lincoln; Richard Gough; Francis Douce; Robert Mason, and others. During the years 1826-42, inclusive, the expenditure on the acquisition of printed books was L.24,368, 2s., and that on MSS. L.1839, 8s.; or, on the average, for both together, about L.1500 annually. The total expenditure during the same period was L.61,696, or about L.3600 a-year.¹ Subsequently to 1842, the Bodleian has enjoyed, in addition to its former funds, the proceeds of the noble gift of L.40,000 bequeathed by the Rev. Robert Mason. It would require a volume to contain an enumeration of the many important additions which have been made to this library by its numerous benefactors, or to admit even a sketch of its ample contents in almost every branch of literature and science. It is estimated to possess upwards of 256,000 volumes of printed books, and about 22,000 volumes of manuscripts.² The Oriental manuscripts are the rarest and most beautiful to be found in any European collection; and the first editions of the classics, procured from the Pinelli and Cr venna Libraries, almost rival those at Vienna. In a word, it is exceedingly rich in many departments in which most other libraries are deficient, and it forms altogether one of the noblest collections of which any University can boast; but, for want of a classed catalogue, the general utility of the collection is materially abridged. The first catalogue of the printed books was published by Dr James in 1600, and an enlarged edition in 1620. These were followed by Dr Hyde's in 1674, and another, of the manuscripts, was printed in 1697. A fuller catalogue of the printed books, compiled by Bowles, Fisher, and Langford, was printed in 1738, in 2 volumes, folio. A catalogue of the manuscripts relating to Oriental history, drawn up by Professor Urie, and printed in 1787, folio, has been continued in two additional volumes or parts by Drs Nicol and Pusey. In 1795 there was also printed a descriptive account of first, early, or Aldine editions of Hebrew, Greek, and Latin works contained in the library, the articles indicated being all of the greatest rarity; and in 1812 appeared the first part of a catalogue by Professor Gaisford, of the manuscript collection purchased by Dr Edward Daniel Clarke, in his travels through various parts of Europe and Asia. Another catalogue of the printed books, by the Rev. Dr Bandinel, was completed in 1843, 3 vols. folio; but such is the rapid increase that a large supplemental volume was printed in 1850, containing only the additions up to the end of the year 1847. Of the Douce Library there is a separate catalogue. A valuable catalogue of part of the Greek MSS. in the Bodleian, by the Rev. H. O. Coxe, was printed in 1853; and is to be followed by similar volumes of other divisions of these most important collections. To the great value, the liberal accessibility (as far as respects men of known attainments and established position), and the skilful arrangements of the Bodleian Library, the highest testimony has been repeatedly borne. The courtesy and kindness of its officers have also long been proverbial. Yet of late the opinion that the time is rapidly approaching when increased facilities may reasonably be hoped for has been gaining ground. As respects far-seeing liberality of expenditure in the promotion of learning, the University of Oxford need fear comparison with no institution in the world. But the more eminent that liberality, the more desirable is it that its fruits should be widely enjoyed. Nor are evidences wanting that on the part of the ruling authorities themselves there is a disposition to make further improvements in this direction.

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The recent inquiries of the Oxford Commissioners gave opportunity for the consideration of the general state and working of the Bodleian, and of the other Oxford libraries, of which advantage was taken for the obtainment of much valuable testimony, but not, unfortunately, including that of the Bodleian officers, the Commissioners having no power to take other than volunteered evidence. Of such as was tendered an able summary is given in the *Report*.³ The conclusions at which the commissioners arrived are briefly these:—(1.) That all the Oxford libraries should be placed under the general superintendence of the professorial delegacy previously proposed. (2.) Admitting the cogency of the objections to any indiscriminate permission to take out books, they are yet of opinion that, "under certain restrictions, and in peculiar cases," books, and even MSS., should be lent; and they refer to the precedent already existing in virtue of a considerable donation of Anglo-Saxon works made to the Bodleian, on the express condition that the Professor of Anglo-Saxon should be permitted to borrow them. Duplicates, they are of opinion, should be lent freely. (3.) They suggest an extension of the reading-room accommodation, and a larger and more accessible supply of books of reference, strictly so called. (4.) They recommend an alteration of the period of the official visitation of the library, so that it shall not take place in full term. (5.) They advise an increase in the number of sub-librarians.⁴

The commencement of the year 1857 has been marked at Oxford by a proposal which would both effectively carry out one of the recommendations we have cited, and (probably) benefit that other public library which the University owes to the generosity of Dr Radcliffe. Dr Acland, present Radcliffe librarian, suggests the conversion of the well known Radcliffe building into a Bodleian reading-room, and the removal of the books to the new Museum of Science, to which in their character they are so closely allied. Of this collection we need only say that, as a library of science, it is worthy of its founder, although it has not at all periods been managed exactly in his spirit. For many years the sum of L.500 a-year was applied out of the Radcliffe estate for purchase of books. That sum, a few years ago, was reduced to L.200, and the reduction led to the accumulation of large arrears in important scientific works, portions of which were already in the library. Radcliffe bequeathed L.40,000 in ready money, and L.250 a-year *in land* for ever. The value of the bequest has "greatly increased of late years," says Mr Strickland,⁵ "in consequence of the 'railway town' of Wolverton (containing 2000 inhabitants) having sprung up on the Radcliffe estate;" but, he adds, "though the Radcliffe trust was specially destined by its founder to public uses, no balance sheet of receipts and expenditure is ever laid before the public."

We have yet to mention, before proceeding to the libraries of individual colleges, a small but well selected collection of foreign literature—French, Italian, and German—which was commenced in 1847, as part of Sir Robert Taylor's "Institution for teaching the European languages." It contains nearly 10,000 volumes, of which about 4000 were bequeathed by the Rev. Robert Finch, and the remainder purchased by the University, to all members of which it is accessible.

The libraries of the different colleges are many of them considerable, some of them extensive, and not a few of them enriched with much that is both curious and rare. Bishop Rede contributed the first part of the collection of

¹ Accounts of the income and expenditure of the Bodleian Library, 1827-43.

² In a return to an order of the House of Commons, dated January 1849, Dr Bandinel reported the number of printed volumes as about 220,000, and of MSS. 21,000. During the years 1826-46, the average annual addition of the former was about 4480 volumes.

³ *Report of the Oxford University Commission* (1852), pp. 115-117.

⁴ *Ibid.*, part iii., p. 105.

⁵ *Ibid.*, pp. 117-119.

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books in Merton College, which has since been augmented, both in manuscripts and in printed books, by the liberality of succeeding benefactors. University College Library possesses a considerable collection of printed books and manuscripts, together with some works of art. Baliol College Library suffered by the depredations of the visitors appointed by Edward VI.; but the damage was afterwards repaired by a supply of books from Durham College, and by successive donations. The Library of Queen's College contains some curious manuscripts, chiefly heraldic and political, a valuable series of coins, a collection of numismatical works, and a fine orrery. This library has been largely increased of late years, chiefly in consequence of the noble gift by Robert Mason of L.30,000, to be applied to the purchase of books; and the additions thus made appear to have been admirably selected. The books of New College occupy two spacious apartments, and there is also a collection of manuscripts. The Library of Lincoln College is chiefly remarkable for a collection of Greek and Latin manuscripts made by Sir George Wheler in his travels. That of All-Souls' College is an excellent collection; it was founded by Colonel Codrington, who left L.10,000 for the purpose, besides his own library, valued at L.6000 more; and was admirably arranged, under the superintendence of Sir William Blackstone. It fills a room nearly 200 feet long. In the Library of Brazen-nose College, the ancient custom of chaining the books to the shelves was strictly observed until the year 1780, when this conservative practice was abandoned. This collection is of considerable extent and value. The Library of Corpus Christi College is enriched with a valuable set of Aldine classics, with many manuscripts and printed books, of great rarity and in excellent preservation, and with the manuscripts of Twyne and Fulman, the Oxford antiquarians. The Aldines were collected by the founder, Richard Fox. In 1755, Lord Coleraine gave to this library a large and valuable collection of Italian literature. The Library of Christ Church would probably have exceeded that of any contemporary establishment, had Wolsey been able to complete his original design, which was not only to supply it with such books as had appeared since the invention of printing, but also with copies of the most valuable manuscripts in the Vatican. This collection is principally composed of the extensive and valuable library bequeathed—the books relating to the British History and Constitution alone excepted (these being left to his son, the fourth Earl)—by Charles Boyle, third Earl of Orrery, amounting to 10,000 volumes; of that left to the college by Wake, Archbishop of Canterbury, consisting of printed books and manuscripts, with a collection of coins and medals, together estimated to be worth L.10,000; and of the contributions of many other benefactors. In 1767 the numismatical series was further enriched by the collection of British and English coins belonging to Dr Barton, and, in 1780, by that of oriental coins collected by Dr R. Brown, canon and regius professor of Hebrew. The Library of Trinity College was instituted by the founder, Sir Thomas Pope, who was also the first contributor of books. The collection was afterwards enlarged by various benefactions, and is now one of considerable extent. The Library of St John's College contains a valuable collection of printed books and manuscripts given by Archbishop Laud; whose zeal on its behalf seems (once, at least) to have led him to use his influence for the diversion thither of a rich gift¹ intended for the Bodleian; many specimens of natural and artificial curiosities, and relics of antiquity; with a collection of Greek, Roman, and English coins, bequeathed by Dr Rawlinson, along with his books. In the Library of Wadham College

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are many early printed books, and a good collection of classics and works on theology, together with French, Italian, and Spanish literature. The Library of Worcester College is a considerable collection, and particularly rich in architectural books and manuscripts. Exeter College Library, though of comparatively small extent, is distinguished for its liberal accessibility. Of the several collections of manuscripts, amounting to 3237 articles, preserved in the different colleges and halls in Oxford, we are indebted to the Rev. Mr Coxe for an admirable catalogue, 1852, 2 vols. 4to. A minute descriptive catalogue of the MSS. in the Ashmolean Museum, by Mr W. H. Black, appeared in 1845, 4to.

In summing up such information as they had gathered respecting the college libraries, the Oxford Commissioners suggest that a more liberal use of them may safely and discreetly be accorded; and that it is worth while to consider whether or not a co-operative arrangement might be effected to carry out, within reasonable limits, such a division of subjects as would enable the libraries to supplement, to some extent, each other's deficiencies.

The Library of Trinity College, Cambridge, is extensive, Cambridge and is contained in a very magnificent structure built by Sir Christopher Wren, being 190 feet in length, 40 in breadth, and 38 in height. The collection is separated into thirty "classes," distributed in cases of oak; and extends to nearly 43,000 volumes. Amongst other literary curiosities, there are some interesting manuscripts in the handwriting of Milton. They are contained in a thin folio volume, which was discovered by Professor Mason amongst the papers of Sir Henry Puckering, and consist of the original MS. of the *Masque of Comus*: several plans of *Paradise Lost*, composed at the period when the poet intended to have made that subject the ground-work of a tragedy; and the poems of *Lycidas*, *Arcades*, and several others. Here are also the Arabic manuscripts left by Dr Gale, and the collection relating to English antiquities by his son Dr Roger Gale; Sir Isaac Newton's copy of his *Principia*, with his manuscript notes, and his letters to Roger Cotes; and the voluminous Shakspeare manuscripts and printed books of Edward Capel, a catalogue of which was printed by Mr Steevens.² More recently Trinity College has received a collection of special interest and value by the bequest of Julius Charles Hare,—a man whose heart was as capacious as his intellect, and whose library, alike varied and choice, reflected his fine tastes. This bequest amounted to 4300 volumes, and is rich in departments of literature, and more especially of German literature, which are rarely well represented in an English library.

To Trinity Library all members of the College have free access; and undergraduates, under the authority of their tutors, are permitted to borrow as many as six books at one time. The books are seldom damaged, say the Commissioners of Inquiry into Cambridge University (in their *Report* of 1852), and they add,—“It is difficult to produce a more striking proof of the safety, under the requisite precautions, of allowing the most liberal use of a great public library.”³

The University or Public Library of Cambridge is large, University and contains much that is valuable or curious both in the library department of printed books, and in that of manuscripts. The printed books comprise a fine series of *editiones principes* of the classics, and a very considerable proportion of the productions of Caxton's press. Its chief founder was Thomas Scott (or Rotherham, as he is more usually called, from his birth-place), Archbishop of York. His earliest donations occurred about 1475; and although some of them have disappeared in the lapse of time,

¹ Letters . . . from the Bodleian Library (Sir K. Digby to Langbaine), vol. i., p. 4.

² *Repertorium Bibliographicum*, p. 110.

³ *Report of Cambridge University Commission* (1852), p. 132.

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others yet remain. It is pleasing to notice that one of the earliest imitators of his example was a mayor of the town, John Harris by name.¹ Archbishop Parker was also a benefactor. But the library suffered many losses; and although, for a brief period, it enjoyed possession of the Lambeth collection (as it had been left at the death of Archbishop Abbot), the borrowed treasure had to be restored, when the Restoration so materially altered the relative position of Bishops and Puritans. The University Library continued to be a very poor collection until, in 1666, Tobias Rustat (one of the gentlemen of the king's bedchamber), gave L.1000 "to be laid out in the choicest and most useful books for the public library." This sum, with a like amount given to St John's College, Oxford, was invested in a Norfolk manor and advowson, and its proceeds are now L.250 a year.² Four years afterwards, Bishop Hacket bequeathed 1092 vols., which had cost him about L.1500. But the Rustat fund was the main support of the library³ until in 1715 it made the important acquisition of the fine collection that had belonged to Dr Moore, Bishop of Ely, amounting to 30,000 volumes, which were munificently purchased for 6000 guineas by his Majesty King George I., who presented them to the library, and further gave L.2000 towards fitting up the apartments destined for their reception. Bishop Moore's collection, which is singularly rich in the productions of the early English printers, had been offered to the Earl of Oxford for L.6000, and on his refusal, was purchased and presented as has just been mentioned. Cambridge may, for more reasons than this, regard its own history as affording striking exceptions to the rule of Georgian indifference to learning, even if due allowance be made for political sympathy. The benefactions of George I. and of George II. to this university exceed, in the aggregate, L.16,000 of the money of that day. This gift appears to have increased the number of volumes to 44,000.⁴ Since this date the chief benefactors have been the Rev. William Worts, and the Rev. John Manistre, both of whom left funds to be applied to the purchase of books, which, together, produce at present L.850 a-year. The copy-tax gives about 3300 volumes a-year on the average; and the University taxes each of its members six shillings a-head towards the maintenance of the library. This poll-tax produced, in 1851, L.2050, subject, however, to the duty on income.⁵ A method of classifying the books in the public library of Cambridge was long ago proposed by Dr Middleton,⁶ but no catalogue of them has yet been published. The number of printed volumes in this library is now a little above 197,000. Amongst the manuscripts—which amount in the aggregate to 3163—contained in it are,—(1), the celebrated copy of the four Gospels and Acts of the Apostles, known by the name of the *Codex Bezae*, which was presented to the university by that distinguished reformer; (2), *Magna Charta*, written on vellum; (3), several very valuable manuscripts purchased at the sale of Dr Askew's collection; (4), some curious Syriac manuscripts presented by the Rev. Dr Buchanan; (5), a Coptic manuscript written upon long narrow papyrus; (6), a Koran upon cotton paper superbly executed; (7), other Oriental MSS., some of which were presented by Burckhardt, and some by the East India Company; and (8), the celebrated MSS. relating to the History of the Waldenses, given by Sir S. Morland in 1658, several volumes of which Mr Gilly⁷ asserts have "been stolen from the University Library within the last 50 years;" whilst Mr Power is of opinion that it "is un-

certain whether there ever came into the library more than those 14 vols. which are there still."⁸ Vol. 1 of a general catalogue of the MSS. has been recently published (1857).

The Library of Corpus Christi College contains 482 Other li-
volumes of ancient manuscripts. Most of them were col-
lected after the dissolution of the monasteries. They com-
prise works of the Fathers and of the Schoolmen; a valu-
able series of documents illustrative of the History of the
Reformation, and of other civil and ecclesiastical affairs, and
the concerns of various religious houses; and some of them
are in the old Saxon character. They were bequeathed by
Archbishop Parker, and are described in Nasmyth's *Cata-*
logue, 1777. St John's College Library contains one of
the most valuable and extensive collections of books in the
university, particularly in biblical and classical literature, and
is also enriched with some first editions which came origi-
nally from the Harleian collection. The *Pepysian Library*,
preserved in Magdalen College, is so called from the foun-
der, Samuel Pepys, secretary to the Admiralty in the reigns
of Charles II. and James II., who bequeathed to this
college his very curious library, together with his prints
and drawings. It is remarkable for a collection of old
English ballads, in 5 volumes folio, begun by Mr Selden,
and continued to the year 1700; for a singular collection
of the popular literature of the day, bound up in volumes
as "penny merriments;" and for two volumes of Scottish
poetry, collected by Sir Richard Maitland, of Lethington,
and known as the Maitland manuscripts. Percy, in his
Reliques, has made a judicious selection from the former;
and, in 1786, Pinkerton published copious extracts from
the latter. Pepys's collection of prints and drawings, illus-
trative of the history of London, and his rare British por-
traits, are particularly valuable.⁹ A volume entitled, *The*
Book Rarities in the University of Cambridge, illus-
trated by original letters and notes, by the Rev. C. H.
Hartshorne, 1829, 8vo, describes many of the more valuable
printed books preserved in the Cambridge libraries.

English
town libra-
ries.

As respects *Town Libraries* of a strictly public char-
acter, England has always been poorly supplied. There
are, indeed, a few cities which have long possessed what
ought to have proved the groundwork of such collections,
but in almost every instance these small foundations of the
seventeenth or eighteenth centuries have fallen into neg-
lect. Since the passing of the "Public Libraries Act" of
1850 a new era in this matter has begun, but the libraries
that have been founded in pursuance of the legislative
measures then initiated are not limited to one portion of
the empire. Such brief account of them, therefore, as can
here be given will be most fitly placed on a subsequent
page. At present we proceed to notice the more eminent
of those English collections which are private property.

Nearly two centuries ago John Evelyn lamented "the
sad dispersions many noble libraries have suffered in these
late times; one auction . . . of a day or two having scat-
tered what has been gathering many years." "Hence it
is," he adds, "that we are in England so defective of good
libraries among the gentlemen, and in our greatest towns." He then passes in review all the collections of mark that
he had himself known, most of which had already, he says,
"passed under the spear, owing to some dark influence
and constellation now reigning malevolent to books and
libraries, which can portend no good to the future age."¹⁰

Of the collections thus noticed, which were exceptions,

¹ Hartshorne, *Book Rarities in the University of Cambridge*, p. 11.

² Power, *Evidence given to the Cambridge University Commission* (1851), p. 53.

³ Continuator of Defoe, *Tour through Great Britain* (2d edit.), vol. i., pp. 110-112.

⁴ *Bibliotheca Cantabrigiensi Ordinandæ Methodus*, in the *Miscellaneous Works of Conyers Middleton*, vol. iv., pp. 74-82 (1755).

⁵ Gilly, *Excursion to the Mountains of Piedmont* (4th edit.), 1823, p. 22.

⁶ *Repertorium Bibliographicum*, p. 109, art. "Pepysian Library," &c.

⁷ Evelyn, *Diary and Correspondence*, vol. iii., pp. 302-309.

⁸ Hewitt, *Memoir of Tobias Rustat* (1849), pp. 49-51.

⁹ Power, *ut supra*, pp. 53-55.

¹⁰ Power, *ut supra*, p. 56.

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as yet, to the common fate, those of Pepys, to whom he was writing, of Bishop Moore, and of Lord Berkeley, have been preserved for the public, as we have seen; but not one of those which were left in private hands has, we believe, survived to our own day, although two or three curious libraries which had escaped Evelyn's notice still exist. A few years later, John Bagford (best known for his MS. collections on the history of printing), enumerates¹ (besides some minor ones) twenty-one private collections of known importance, of which one only seems to have so continued intact. In 1810, again, we find a list of nine libraries, described as "a few of the chief private libraries in the kingdom."² Of these six have been sold; one (Mr Grenville's) has become public, and one we are unable to trace. The remaining collection, that of Lord Spencer, is unquestionably the finest private library in Britain, and is, perhaps, the finest in the world.

Earl
Spencer's
library.

Lord Spencer's Library (the greater part of which is at Althorp, Northamptonshire), is eminently deserving of mention, not so much by reason of its extent, although that is considerable, as on account of the unrivalled treasures which it contains in several departments of literature, sacred as well as secular. This library contains more than 50,000 volumes, exclusively of the Cassano collection purchased in 1820, and was chiefly formed by George John, second Earl Spencer; the greater part of the old library of Althorp, so frequently mentioned by Evelyn, having long since become the foundation of the fine collection at Blenheim. Dr Dibdin, in his *Bibliotheca Spenceriana*, has devoted six volumes (in addition to the Cassano volume) to a bibliographical description of the books printed during the fifteenth century, or otherwise remarkable, either for intrinsic worth, or for beautiful typography.³ The foundation of the choicer part of the library was laid by the purchase, about 1790, of the collection of Count Reviczky, a Hungarian nobleman who had at first occupied himself in accumulating rare and curious works of a peculiar description. The choice condition and splendour of the entire collection are such as render it unrivalled.⁴ But, perhaps, its most remarkable feature is the unexampled assemblage to be found in it of works illustrating the origin and progress of typography. It contains several books, consisting of impressions taken from carved wooden blocks previously to the invention of metallic types, and thus exhibiting the earliest specimens of stereotype printing. In others, engraved figures constitute the principal part, to which is added a small proportion of text, and only one side of the leaf is employed, the other being left blank. Such is the *Ars Memorandi notabilis per figuras Evangelistarum*, supposed to have been thrown off previous to the year 1430, and consisting of a number of rude cuts of the principal events recorded in the Gospels, with text on the opposite page; and such, also, is the *Ars Moriendi*, the subject of which is a sick man in bed, surrounded by grotesque and hideous figures of angels and demons. The taste of the time inclined to the monstrous or the absurd. In the first-named work St Luke is represented by a bull standing on his hind legs, whilst St Mark is depicted as a rampant lion. The *Historia Veteris et Novi Testamenti, seu Biblia Pauperum*, also in this collection, is supposed to have been executed prior to the year 1400, and is by some considered as the earliest specimen of block-printing. Amongst the

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early printed and scarce Bibles in the Althorp Library may be mentioned the "Mazarine Bible," (already noticed in our account of the Grenville Library); another Bible, supposed to be the work of Albert Pfister, prior to 1460; Fust and Schœffer's Bible, 1462, on vellum; that by Sweynheym and Pannartz, 1471; the first edition of the greater portion of the Old Testament in Dutch, 1477; Prince Radzivil's Bible in Polish; besides other early copies in the different languages of Europe. This collection also contains the Latin Psalter of Fust and Schœffer, printed in 1457, being the first printed book to which a date is affixed; and another of nearly equal rarity, printed in 1459. Many of the earliest editions of the classics, beautiful copies on vellum, and works of all the celebrated printers of the fifteenth century, add to the value of this unrivalled collection. The Cassano Library,⁵ purchased by Earl Spencer in the year 1820, and the greater part of which was soon afterwards united with his general collection, formed a valuable addition to the Althorp Library. Amongst other rarities, it contained the famous edition of Horace, printed at Naples in 1474, by Arnoldus de Bruxella, of which there is no other known copy; that of Terence, printed by Riessinger, without date, but probably not later than 1471; the earlier productions of the Neapolitan press; rare editions of the early Italian classics; specimens of early printing at Rome, including the edition of Juvenal, printed in the smaller fount of Ulric Han; together with all the rarest editions of Virgil, Horace, Ovid, and other Roman poets.⁶ The far-famed Boccaccio's *Decamerone*, printed by Valdarfer in 1471, which, at the Roxburghe sale, in 1813, produced the astounding price, for a single volume, of L.2260, was afterwards acquired by Earl Spencer for a sum considerably less than half that amount. The Library occupies a noble suite of rooms, the entire length of which is 220 feet.

Many fine and even extraordinary collections have been both formed and dispersed by public auction within living memory. Such, for example, were Heber's, Bindley's, Sir Mark Sykes', Hibbert's, George Chalmers',⁷ the Duke of Sussex's, and the Marquis of Blandford's. Of other private libraries, such as those of the Duke of Marlborough at Blenheim, of the Duke of Devonshire at Chatsworth, of the Earl of Ellesmere at Bridgewater House, and other noble collections, interesting particulars might be given; we shall, however, only notice one other private collection, that of Sir Thomas Phillipps, Bart., at Middlehill, Worcestershire, which, we earnestly hope, may long escape any such fate. It is a noble library, far exceeding in intrinsic worth its relative extent, although the number of volumes approaches 50,000. The specialty of the collection consists in the very exceptional fact that the number of manuscripts far exceeds that of printed books. Its formation has been prosecuted with energy, and with large outlay, during more than thirty years, and the result is now a thing which, once seen, will never be forgotten. The most striking peculiarity of aspect lies in the long ranges of boxes, tier above tier, and of uniform size, each with its falling front, in which nearly all the books are lodged; not, indeed, for concealment, but by way of safeguard against that terrible foe of libraries—fire. The books are almost as little visible as are those of the Vatican, but how different their accessibility is known to a considerable number of students who have profited largely by their contents.⁸

Library of
Sir T. Phil-
lipps.

In Scotland, at an early period, there were collections of

¹ Bagford, *Account of Libraries* (MS., Harl.)

² *Monthly Review* (1810), vol. lxiii., p. 4.

³ Dibdin, *Bibliotheca Spenceriana* (London, 1814-23), 4 vols. royal 8vo, with three supplementary volumes.

⁴ Dibdin, *Ædes Althorpiæ*, vol. i., p. 37.

⁵ So called from the Duke of Cassano Serra, a Neapolitan nobleman, by whom it was sold to Earl Spencer.

⁶ See Supplement to the *Bibliotheca Spenceriana*, forming vol. v. of the Descriptive Catalogue of the Books printed in the fifteenth century, &c. (1823).

⁷ Some of the best MSS. and books of Chalmers' Library are now in the very curious and considerable collection of Mr James Crossley, President of the Chetham Society.

⁸ Nor does this liberality confine itself to the writers and students of Britain. It were easy to name a score of important foreign works which have derived rich materials from Middlehill: but the many readers of the *Monumenta Germanica Historica* of Dr Pertz, or

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manuscripts belonging to most of the religious or monastic establishments; and there are preserved brief inventories of books belonging to some of the cathedral churches.¹ We also find notices of private collections during the end of the fourteenth and the following century. But the earliest public library was that of the University of St Andrews. In a *Prognostication*, by Jasper de Laet, printed abroad in 1491, and addressed to William Schevez, Archbishop of St Andrews, who filled the see from 1478 to 1497, the author celebrates that prelate for his love of science, and for enriching the library with many precious books and manuscripts of all kinds.² The library still exists, but the *plures codices* referred to have long since been dispersed. The name *codex*, however, was applied to printed books as well as manuscripts; and volumes are occasionally met with having the name of Schevez, and other early collectors, written or impressed with their arms on the books. The library of James IV. is alleged to have been carried by the English from Holyrood in 1547.³ One book, belonging to James V., being Bellenden's *Chronicles of Scotland*, translated from Hector Boece, and printed on vellum, about 1541, and having the royal arms on the sides, is now preserved at Hamilton Palace; and the original manuscript of the same work, written in 1536 or 1537, and similarly ornamented, is at Dupplin. Mary Queen of Scots was also a collector, and partial lists of her books, including French poetry and romances, have been printed, and a few of the volumes are known and highly appreciated.

Advocates'
Library,
Edinburgh.

The design of forming a library was adopted by the Faculty of Advocates as early as the year 1680. The author and active promoter of the scheme was Sir George Mackenzie of Rosehaugh. It was originally intended that it should consist merely of the works of lawyers, and of such other books as were calculated to advance the study of jurisprudence. This may be inferred from the inaugural address delivered by Sir George Mackenzie, when the library was first opened, and from several other papers relative to the subject. At its commencement, this library had no certain fund allotted for its maintenance. It depended upon and owed its increase to the donations of benefactors, together with such sums as the Faculty from time to time placed at the disposal of the curators. In the year 1700, the apartment where the library was kept being nearly destroyed by fire, it was removed to the place which, in part, it still occupies, namely, the ground floor of the Parliament House. During the nine years immediately following, it must have increased considerably,⁴ since by the act passed in the eighth year of Queen Anne's reign, the privilege of receiving a copy of every book entered at Stationers' Hall was conferred upon it, along with eight other libraries, four of which were Scottish, being those attached to the universities of St Andrews, Glasgow, Aberdeen, and Edinburgh. It is the only library in Scotland which retains this privilege.

The department of printed books comprehends, in a greater or less degree, almost every branch of science, philosophy, jurisprudence, literature, and the arts. As might be ex-

pected, the collection of law-books is very extensive. The historical collection, also, is exceedingly valuable. The series of Greek and Roman classics, though it cannot vie with some others, is also extensive, and includes several first, and many early editions. The library is rich in modern poetry and belles-lettres, and, besides the miscellaneous department, contains a very considerable collection of voyages and travels. It is defective in the great branch of mathematical and physical science; in archæology or antiquities; in early as well as modern Italian literature; and, generally, in foreign literature of a recent date. Amongst the separate collections are, the Astorga Library, the Thorckelin collection, and that of old Scottish books. A collection of Spanish books, amounting to about 3400 volumes, which had formed part of the library of the Marquis of Astorga, was purchased from a London bookseller in 1824, for the sum of L.3000. The Thorckelin collection, so called from Professor Thorckelin, to whom it originally belonged, contains about 1200 volumes, chiefly on northern history, antiquities, and law. Of the Scottish books, those relating to old Scottish poetry are exceedingly rare and curious.⁵ There is also a collection of German dissertations, amounting to upwards of 100,000, called Count Diedrich's collection, which was purchased by Sir William Hamilton, on account of the library, for the trifling sum of L.80. This library is not rich in typographical rarities; with the exception of the Mentz or "Mazarine" Bible, and some specimens of early printing in Scotland. The total number of printed volumes contained in the library was, in 1849, officially returned to the House of Commons, as 148,000.⁶ "No return," it was added, "can be made of the works received by the Advocates' Library, under the copyright acts, no account having been kept." If, however, we assume (1), that the number of volumes yearly added to the library from this source must nearly correspond with the *average* number so received by other libraries having the same privilege; and (2), that the books received are preserved; it will follow that the aggregate number of volumes must now (1857) have increased to at least 172,000. As to this copyright increment, there is a passage in the evidence of Mr Maitland (then Solicitor-General, and subsequently Lord Advocate for Scotland), before the Select Committee on Public Libraries of 1849, which has a claim to be quoted:—"As the library is the private property of the Faculty," said the Solicitor-General, "it may at first sight appear difficult to find grounds for legislative interference with it. But . . . the possession of the privilege of Stationers' Hall gives, in my view, a very sufficient ground. . . . It could never have been the intention of the statute to give that privilege to injure authors and publishers by immediately converting the books so given to the ordinary purposes of a circulating library. . . . As the books come from the Stationers' Hall, they are boarded, and are immediately placed upon the public tables. In this way, not only . . . ephemeral literature, but works of the highest value, published

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of the *Archives des Missions Scientifiques*, published by the French Ministry of Public Instruction, will be in possession of better testimony than ours on this point.

¹ *Registrum Episcopatus Glasguensis*, vol. i., p. xliii.; vol. ii., p. 344. *Registrum Episcopatus Aberdonensis*, vol. ii., pp. 127-137, 154-159.

² *Dunbar's Poems*, by Laing, vol. ii., p. 348, Edinburgh, 1834, 2 vols. 8vo.

³ *Archæologia Scotica*, vol. iv., p. 1-13.

⁴ In 1707, the library received a large donation of books in natural history, to which many of the most costly and magnificent works on that branch of science have since been added.

⁵ The first productions of the Scottish press preserved in this library should not pass unnoticed. One of these is a unique volume of poetical tracts, printed by Walter Chepman and Andrew Myllar in 1508; of which there exists a limited reimpression in fac-simile, 4to, 1827. The next is a copy of the well-known *Breviarium Aberdonense*, of which a careful republication has recently appeared. This Breviary was composed by, or under the direction of William Elphinstone, then Bishop of Aberdeen, for the use of his cathedral, and printed in the year 1509; and it consists of two volumes in small octavo, but of the first volume the title-page and some leaves at the end are wanting. The second volume, printed in 1510, has at the beginning a calendar, and at the end these words:—"Opido Edinburgensi impresso jussu et impensis honorabilis viri Walteri Chepman ejusdem opidi Mercatoris quarto die Junii millesimo CCCC decimo." On the outside of this leaf is a wooden engraving representing a man and woman clothed in skins of beasts, with their shoulders bare, and their heads adorned with wreaths of flowers; whilst between them stands a tree, from which is suspended a shield with W. C. in cipher. The most perfect copy known is that preserved in the Library of the University of Edinburgh.

⁶ *Public Libraries: Abstract of Supplemental Return*, 9th March 1849 (Sess. No. 18), p. 2.

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in this country, are immediately converted to common circulating purposes. . . . They do not remain a public deposit, but are, to a great extent, so destroyed by the mode in which they are used, as to be unfit to be deposited in a great public library."¹

The department of manuscripts, though not so extensive as in some other libraries of the same class, is nevertheless of great interest and value with reference both to the civil, and still more to the ecclesiastical history of Scotland. Soon after the foundation of the library, the Faculty appear to have turned their attention to the collection of MSS. and this important department now consists of nearly 2000 volumes. The most valuable portion of the MSS. is that which relates to the ecclesiastical state of Scotland immediately preceding the era of the Reformation, and includes, amongst other things, thirteen chartularies or volumes of records of the different religious houses, which escaped the general destruction in which the edifices themselves were then involved. Considerable light is also thrown on the civil and ecclesiastical history of Scotland at a later period, by the documents and other materials contained in the collections of Sir James Balfour, Sir Robert Sibbald, and Wodrow the historian. Balfour's collection, which consists of upwards of 150 volumes, was purchased in 1698. About the half of it consists of original state papers, and several very curious royal letters written in the times of James VI. and Charles I. One of the volumes consists of letters by Anne of Denmark, queen of James VI.; by Prince Henry and Prince Charles, his sons; by the Princess Elizabeth, his daughter; and by the Elector Palatine and his son to James VI., entirely of a familiar nature. From these, some partial selections were made by Lord Hailes, and printed in 1762 and 1765. Most of these chartularies, as well as the more important original letters and state papers referred to, have been published by the Bannatyne Club and other literary associations. The *Annals of Scotland*, compiled by Sir James Balfour, were also printed in 1824, 1825, in 4 volumes 8vo. But there still remain unprinted some MSS. on genealogy and heraldry, besides a considerable number of curious documents. Sir Robert Sibbald's collection, consisting of upwards of 30 volumes, was purchased by the Faculty in 1723. It is chiefly of a topographical and literary character. Wodrow's collection is much more voluminous, consisting of upwards of 160 volumes. It was chiefly from this immense mass of materials that that laborious writer compiled his *History of the Sufferings of the Church of Scotland*; other portions have been published by the Wodrow Society; but by far the greater portion of the collection, containing many original letters and papers, is still unprinted. His correspondence with many eminent literary characters, embracing a period of more than thirty years (from 1694 to 1726), and extending to about 30 volumes, is also full of curious information respecting the literature and history of the period to which it refers. A collection of original documents belonging to the reigns of James V., Queen Mary, and James VI., was presented to the library by the Earl of Balcarras. These MSS., consisting, as now arranged and bound, of 9 volumes folio, include letters from James V., and the Earl of Arran, governor of the kingdom in the infancy of Queen Mary, to the Kings of England, France, Norway, and Portugal, to the Duke of Guise, the Earl of Suffolk, and others, from 1539 to 1542; also original letters by Queen Mary, addressed to her mother the Queen-dowager, during the early years of that beautiful but ill-fated princess. This department also contains Lord Fountainhall's collections, in his own handwriting,

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including his decisions, historical notices, diary, and other matters; from which his published papers have been selected. We may likewise notice the curious and interesting papers of James Anderson, Murray of Stanhope, the correspondence of Gough and Paton, with portions of the MS. collections of George Chalmers and of General Hutton, which have been arranged and bound in several folio and quarto volumes; and also those collected by the Rev. James Scott of Perth, consisting of about 20 volumes folio, and comprising the Blackfriars' Charters, in 3 volumes; extracts from the records of the Church of Perth, in 4 volumes; the records of the Hospital from 1577 to 1732; extracts from the records of the Kirk-session; a chronicle; and a register of baptisms and deaths.

The same department includes a number of manuscripts on heraldry, genealogy, and Scottish law, besides many of a miscellaneous nature. It also contains several early MSS. of the classics, and a few illuminated missals. Amongst the former may be mentioned a very fine copy of Horace, belonging to the thirteenth century; the *Plays* of Terence, executed in the year 1436; a copy of the *Epigrams* of Martial, in perfect preservation, which, from the style of the writing, may be ascribed to the ninth century, and is supposed to be one of the most ancient manuscripts of the *Epigrams* extant;² a copy of Valerius Maximus, beautifully written on vellum, dated 1398; Lactantius, *De Opificio Dei*, a gem of its kind; the mathematical collections of Pappus of Alexandria, written in beautiful Greek, with admirably executed diagrams; besides portions of several classics, as Cicero, Ovid, Juvenal, and Persius, all of considerable antiquity. A manuscript copy of St Jerome's translation of the Bible, supposed to have been written about the tenth century, and said to have been found in the Abbey Church of Dunfermline during the reign of David I.; the Auchinleck Manuscript is a collection of ancient English poems and metrical romances, written about the middle of the fourteenth century: it is so named after the donor, Alexander Boswell of Auchinleck, one of the Lords of Session, in 1744 (from this volume Sir Walter Scott printed the *Romance of Sir Tristrem*). Bannatyne's Manuscript, rebound in 2 vols. folio, being a miscellaneous collection of Scottish poetry, and "written by Geo. Bannatyne in the time of his youth, 1568,"³ likewise adorns this department of the library. It was from Bannatyne's collection that Allan Ramsay selected the poems which were printed in the *Evergreen*; and from the same source Lord Hailes extracted a volume, which was printed in the year 1770. In 1825 about 100 volumes of Icelandic MSS., amongst which are several ancient Sagas, were purchased of Professor Finn Magnuson, of Copenhagen, and added to the collection; and in the following year, Mr Elphinstone, and Mr Erskine, formerly of Bombay, presented to the library some valuable Persian and Sanscrit MSS. A beautiful manuscript of the Hebrew Bible, in 2 large folio volumes, was purchased in Germany; and the Pentateuch, besides the original, has also the Chaldaic paraphrase. A manuscript of the *Corpus Juris Civilis*, well executed, but of uncertain date and doubtful authority, and another of the *Pandects*, were likewise purchased several years ago.

The library is governed by five curators, one of whom goes out of office annually by rotation, and another is elected in his stead from amongst the body of the Faculty. Under the curators are a principal keeper or librarian, and several assistants. The library is supported partly by the acquisitions which it is continually making in virtue of the right conferred upon it by the Copyright Act, and partly by an annual sum paid to the curators for the use of the establish-

¹ *Minutes of Evidence of Select Committee on Public Libraries*, 1849, Q. 1444, p. 94.

² An account of this manuscript was published by Mr Dalrymple in 1811, in 8vo, two copies of which were printed in vellum.

³ Bannatyne's manuscript was presented to the library, in the year 1772, by the Earl of Hyndford.

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ment out of the revenue of the Faculty. Strangers arriving in Edinburgh are freely admitted to the library; and any one who is at all known is never denied the privilege of resorting to, and of reading or writing in the library. Very eminent men have been keepers of this collection, particularly Thomas Ruddiman, David Hume, Adam Ferguson, and Dr Irving, a learned civilian, well known by his *Life of Buchanan*, and other works.

The first volume of the general catalogue was begun in 1735, and printed in 1742, under the superintendence of the learned Ruddiman and Walter Goodall; and this was followed by two others in 1776 and 1807, all in folio; but the MS. additions which have since been made are at least equal to other two printed volumes of the same size. A catalogue of the law books was printed in 1831, in octavo; but an entirely new catalogue of the whole contents of the library has been for several years in course of preparation.

Library of
the Writers
to the
Signet.

The Library of the Writers to Her Majesty's Signet, is an excellent miscellaneous collection of books in the sciences, law, history, geography, statistics, antiquities, literature, and the arts; and it has recently been rendered much more accessible by the ample and spacious accommodation provided for it. It is contained in two large and beautiful apartments, both under the same roof, with small rooms adjoining. The books are so arranged in classes or departments as to afford facilities for reference, and to exhibit, in a general way, the component parts or branches of the collection. The choice and condition of the books generally deserve particular notice; and, indeed, this library, though supported exclusively from the funds of the society to which it belongs, possesses some of the noblest and most expensive works ever published, either abroad or at home. The number of volumes may be estimated at nearly 45,000. There is a classed catalogue, formed on De Bure's system, and very skilfully executed, which was printed in the year 1805; but this applies only to a small portion of the collection, which has been very greatly increased since the catalogue in question was prepared. An alphabetical catalogue of the whole collection has been printed, in progressive parts, with (1836) a *classed index*, which, in a great measure, supplied all the advantages of a catalogue according to subjects. A classed catalogue of the department "Jurisprudence" has recently (1856) been completed; and it will probably be followed by other portions of a general catalogue. The government of the library is vested in a body of curators, elected by the Society. Here, as in the case of the Advocates' Library, the utmost liberality is shown to strangers, and to literary men generally.

Edinburgh
University
Library.

Like most other college libraries, that of the University of Edinburgh was founded by a donation; and, for a long period, the casual contributions of benefactors constituted its principal means of support, as well as of increase. In 1580, Mr Clement Littill, commissary in Edinburgh, bequeathed his library, consisting of about 300 volumes, chiefly theological, "to Edinburgh and the Kirk of God," and this small collection was afterwards transferred by the Town Council to the College, which they were then instituting. Littill's bequest thus laid the foundation of the University Library. But it was subsequently augmented, partly by the donations of citizens, and still more by the benefactions of persons who had received their education in the College. Amongst the latter may be mentioned Dr Robert Johnston, the Rev. James Nairne, and, above all, Drummond of Hawthornden, one of the favourite sons of the Scottish muse. His gift is the more valuable, because,

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independently of the high reputation of the donor, the collection is enriched with many rare specimens of our early literature. In 1627 a list of these was printed in *Auctarium Bibliothecæ Edinburgensæ*; but he gave several other books in 1628 and 1635. These are now collected together. A catalogue of Nairne's books was also printed in 1678. The acquisition of Dr Andrew Balfour's collection in 1697, which served as the foundation of the College Museum, has been much less fortunate. In 1764 the Library of the Incorporation of Surgeons was added to that of the College, in consequence of an agreement, which has eventually proved eminently advantageous to the former body, whatever may be the case in so far as regards the interests of the University. This collection consisted of about 500 volumes, almost entirely professional, and now of very little value. The principal bequest which the library has more recently received is that of Dr William Thomson, who, in 1808, left it about 600 volumes, chiefly on medical subjects. In a testamentary bequest by the late General Reid, who was educated at this university, mention is made of the library, as an object to the improvement and extension of which his munificent legacy is, amongst other things, to be applied. The funds by which the library is maintained, and its progressive enlargement secured, are matriculation fees, fees on graduation in three faculties, a donation of L.5 from each professor on his induction, an annual payment of L.20 by the College of Surgeons, occasional donations of books, and a grant of L.575 from government, in compensation of its abolished privilege. The ordinary management of the library is vested in nine curators, appointed annually by the *Senatus Academicus*, four of whom retire from office every year, and are immediately succeeded by an equal number of such professors next in seniority, as are willing to undertake the duty. Four of these curators are from the medical, one from the theological, and four from the general department, including classes neither medical nor theological.¹ This library consists of somewhat more than 100,000 volumes, and about 400 MSS. The accommodation provided for it is of the most magnificent description, the library-hall being by far the most spacious and noble apartment in Scotland. As to the collection generally, it contains much that is valuable, and a good deal that is both curious and rare; but, considered as a repository of varied information in science and literature, it is unequal and defective. Its most ample department is that of medicine, a purely professional one, and more largely replenished than any other with obsolete matter. Those of natural philosophy and natural history are tolerably supplied with the works belonging to them. But in classical literature, including under that head all that relates to the exposition and illustration of the ancient authors, there are perhaps few great libraries more defective.² It is to be hoped, however, that every exertion will be made to give to the collection that character of generality, founded upon the possession of all that is most useful and interesting in every branch of knowledge, which constitutes the best recommendation of a great public library. This it is which has imparted to the Library of Göttingen its great and acknowledged excellence. The only catalogue yet printed is one of the books relating to medicine, arranged alphabetically according to the names of the authors.³ The library is, of course, primarily for the use of members of the university, and of the College of Surgeons. "But literary gentlemen, or others, who have occasion to consult or to borrow books, on application to the curators, or to individual professors, willing to be responsible for them, are allowed every prac-

¹ *Report of Commissioners on the Universities and Colleges of Scotland*, App. p. 167, et seqq.

² *Edin. Evid.*, p. 648, quoted in the Appendix to the *Report of the Commissioners on the Univ. and Coll. of Scotland*, p. 172.

³ *Catalogus librorum ad rem medicam spectantium in Bibliotheca Academicæ Edinburgensis, secundum auctorum nomina dispositus. Editio altera. Edinburgi, 1798, 8vo.*

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ticable facility.¹ In addition to the public, there is attached to the University a theological library, founded towards the close of the seventeenth century, and now containing about 5000 volumes. In connection with the New College, established by the Free Church, there is an excellent library chiefly of works on theology, amounting to nearly 25,000 vols. Among other special libraries in Edinburgh, there are those of the Royal College of Physicians, founded in 1682, having, according to the printed catalogue in 1849, 9000 volumes; the Royal Medical Society, instituted 1737, with upwards of 16,000 volumes; the Philosophical Institution; the Watt Institution and School of Arts; the Solicitors before Supreme Courts; Solicitors-at-Law; Edinburgh Subscription Library, 1794; Select Subscription Library, 1800; and Edinburgh Mechanics' Subscription Library, 1825.

Glasgow
University
library.

The history of the Library of Glasgow College, though curious and interesting, is chiefly a register of the numerous successive donations by which it was gradually formed. Amongst the names of its early benefactors we find that of George Buchanan, who, it appears, presented to the college 20 volumes, consisting entirely of Greek works, chiefly classics,² and made other benefactions, the extent of which cannot now be ascertained. This library is stated in the official return of 1849, to have contained at the close of the preceding year, 58,096 volumes of printed books, and 242 MSS.³ It receives £707 a-year from the Consolidated Fund for the purchase of books, and must now (1857) contain at least 75,000 volumes. The other funds for its support are derived from the interest of certain small sums bequeathed by individuals, from graduation fees, and from the contributions of students, including the interest accruing from the deposit money. Amongst the manuscripts in this library are several volumes by Wodrow, principally on biography. A catalogue of the printed books, by Professor Arthur,⁴ appeared in 1791. Two supplements have since been published in 1825 and 1836.

St Andrews
University
library.

There was at an early date a library in each of the Colleges at St Andrews,—one such library has been referred to already, as the earliest Scottish collection on record,—but no mention is made of a University Library until about the commencement of the seventeenth century. At that period there occurs a notice of such a collection; and a catalogue of its contents, made at the time, is still extant, the books being chiefly presents from James VI. and the members of his family. With this public University Library, those of St Salvador's and St Mary's Colleges came, in process of time, to be incorporated; and, about the year 1780, that of St Leonard's College, the best of the collections, was conjoined with the rest. As now constituted, the library is supported by the interest of money made up out of the excess of the receipts above the expenditure of its funds; the surplus rent of some teinds and lands held in lease from the Exchequer; certain fees on graduations; together with the grant of £630 a-year from the Consolidated Fund. It contained in 1848, 51,265 volumes of printed books,⁵ and now contains about 61,500 volumes, and 63 MSS.; it is, upon the

whole, an excellent collection. There is a printed alphabetical catalogue to the year 1826, and a progressive manuscript one since that time. There is also a classed catalogue in manuscript. All students attending the University have the use of the library, free of expense, both for consulting and for borrowing books. Other persons, whether resident in St Andrews or elsewhere, if engaged in literary or scientific investigations with a view to publication, may borrow books, under guarantee, on application to the Senate, and free access to the library for the purpose of consulting is granted to any respectable person.

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There is reason to believe, that from the first institution of the University of Aberdeen there was a collection of books at King's College, but no particular record of the library or its management, prior to the year 1634, is now to be found. The collection contains about 37,000 printed volumes, and 74 MSS. Amongst the latter are one of the splendid copies of the Koran said to have belonged to Tippoo Sahib; a work on Hindu theology, written upon fine vellum, and rolled on a piece of ivory, like the *volumina* of the ancients; and a Shaster in Sanscrit, written on the leaves of trees. The grant assigned to Aberdeen, in lieu of the copy-tax, amounts to but £320 annually, that being the estimated average value of the books which it had actually received. The official reply to the inquiries as to public facilities runs thus:—"The library is accessible to all the Professors and Lecturers of this University and of Marischal College, as well as to all graduates and students of the former, on depositing the value of the books received."⁶ This state of things has long been unsatisfactory to Marischal College; the Supreme Civil Court of Scotland having long since decided that the books acquired by copy-tax were to be kept in King's College, "for the use of both colleges." But, as of late the old project for a reunion of the colleges has been revived, it is probable that this minor question, with others of greater moment, may be satisfactorily solved. The separate Library of Marischal College had its origin in a collection of books made at the time of the Reformation by the magistrates of Aberdeen, and partly procured from the suppressed monasteries of that city.⁷ The number of printed volumes in it is about 12,000, and of MSS., 100. The funds for augmenting this library arise from fees of graduation, and are of very small amount.

The Library of Trinity College, Dublin, owed its establishment to a singular incident. In the year 1601 the Spaniards were defeated by the English at the battle of College, Kinsale. Determined to commemorate their victory by some permanent monument, the soldiers collected amongst themselves the sum of £1800, which they agreed to apply in the purchase of books for a public library, to be founded in the then infant institution of Trinity College.⁸ This sum was placed in the hands of the celebrated Ussher, who proceeded to London, and there, in conjunction with his friend Dr Challoner, purchased the books necessary for the purpose. It is a curious coincidence, that Ussher, whilst occupied in purchasing these books, met in London Sir Thomas Bodley, engaged in similar business, with a view to the

¹ *Supplemental Return* (1849), *ut supra*, p. 4.

² Such as the works of Plutarch, Plato, Demosthenes, Apollonius, Aristophanes, Strabo, and Euclid.

³ *Supplementary Return* (1849), *ut supra*, p. 2.

⁴ *Catalogus impressorum librorum in Bibliotheca Universitatis Glasguensis, secundum literarum ordinem dispositus. Labore et studio Archibaldi Arthur, A.M., Glasguæ, 1791, folio.* A second volume consists of a press catalogue, printed by Andrew Foulis.

⁵ *Supplemental Return*, *ut supra*, p. 2.

⁶ *Ibid.*, p. 3.

⁷ These books were retained in one of the churches, under the care of the magistrates, and were called the Town's Library, and *Bibliotheca Ecclesiastica*. On the 19th of May 1624, Mr Thomas Reid, Latin secretary to James VI., bequeathed his books to the college, and left 6000 merks to the town, the interest of which was to be applied as a salary to a librarian. Reid's collection was afterwards united to the *Bibliotheca Ecclesiastica*, and to the books bequeathed by Dr Liddel, and other benefactors; and the whole, forming one collection, was deposited in the college, of which it now constitutes the public library. (See Appendix to the *Report of Commission on the Universities and Colleges of Scotland*, p. 361.)

⁸ Parr, *Life of Ussher* (1686), p. 10. The writer's words are too striking to be passed over: "That army," he says, "resolved to do some worthy act that might be a memorial of the gallantry of military men, and of that due respect they had for true religion and learning." The college had been established nearly ten years before, but no mention of a library occurs in its accounts until the audit of 1605. (*Report of Dublin University Commission*, July 1852).

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augmentation of his famous library at Oxford, and established with him a friendly intercourse and co-operation. From this commencement, the Library of Trinity College was at different periods increased by many valuable acquisitions, including, after many obstacles and long delay, that of Ussher's own collection, consisting of nearly 10,000 volumes. It had been the primate's intention to bequeath what remained to him of his noble library to Trinity College, but the loss of his revenue compelled him to leave it as a provision for his daughter. Both Cardinal Mazarine and the King of Denmark made liberal offers for its purchase, but an order of the Council of State prevented its exportation. "At length," says Ussher's biographer, "it was bought by the soldiers and officers of the then army in Ireland, who, out of emulation to the former noble action of Queen Elizabeth's army, were incited . . . to the like performance; and they had it for much less than . . . had been offered for it before."¹ In a few years, its growing magnitude requiring a corresponding increase of accommodation, the present library-hall, a magnificent apartment of stately dimensions, was erected in the year 1732. In 1726 Dr William Palliser, Archbishop of Cashel, bequeathed his library of 4109 volumes. Ten years later Dr Gilbert gave his own library of 12,749 volumes, and arranged them, in person, on the shelves. In 1787 the entire collection consisted of 36,047 volumes of printed books, and 1111 volumes of MSS. and prints. When the French invaded Holland in 1794, the collection of Pensionary Fagel, amounting to 17,537 volumes, was removed to England, where, in 1802, it was purchased by the College for the sum of L.10,000, towards which sum L.8000 was granted for the purpose by the trustees of Erasmus Smith.² Another important addition was made to the original collection by the acquisition of the select and valuable classical and Italian books which had belonged to Mr Quin; and a considerable increment of books has also resulted from the copy-tax, by which the college has profited since the year 1801. Altogether, the Library of Trinity College now forms one of very high value, and is under admirable management. In the department of printed books, the total number of vols., in September 1851, amounted to 107,650. When reckoned in August 1856, there were 126,095 printed vols., and 1600 MSS. The Ussher MSS. amounts to 693, the Stearne MSS. to 135, the Stearne and Alexander to 77, and those presented by other persons to upwards of 400 volumes. Ussher's MSS. may be classed into Bibles, and parts of Bibles, with commentaries; breviaries, missals, Roman rituals, the works of the Fathers, and oriental writers; systematic, scholastic, and polemic writers; catalogues, philosophical, medical, and historical; and, lastly, Irish histories and genealogies, civil and ecclesiastical. The subjects of the Stearne MSS. are somewhat similar to these, with the exception that some of them treat of forensic matters. In this department of the collection, there is preserved the Gospel of St Matthew, along with other fragments of Scripture, written in Greek capitals, and ascribed by Dr Barret to the sixth century. The total number of MSS. is about 1620. In 1848 a new reading-room was completed and opened for the use of readers.

As to catalogues, this library will soon be much better supplied than it has hitherto been. A very elaborate alphabetical catalogue (of which we have seen a portion) has been long at press, and is now advancing towards completion. Of the Fagel collection, the printed sale catalogue (by Paterson) has always been useful, both from its plan and

its careful execution. There is another and alphabetical catalogue of this part of the library in MS., as there is also of the collection of MSS. By the library statutes, access to the reading-room is restricted to graduates, and of them to such only as shall take the prescribed oath. But the enacting words, whilst they expressly exclude undergraduates, do not, in direct terms, exclude non-members of the University.³ The heads have accordingly given them, in practice, a liberal interpretation. No books are lent from this library; but a special lending collection has been provided for the undergraduates. It contains about 3000 well-selected volumes, and has worked advantageously.

Dublin has another library, strictly public in character, Archbishop Marsh's which has rendered eminent service to learning, though it is of small extent, and has narrow funds. Founded by Archbishop Marsh, about 1694, it was incorporated by act of parliament in 1707, and endowed by the founder's will in 1713. Lapse of time, and its results, which, in so many cases, have largely enhanced the value of endowments, has here seriously diminished what was formerly a fair maintenance fund. The library includes Bishop Stillingfleet's collection,⁴ another collection formed by its first librarian, and a series of nearly 3000 volumes, given by Bishop Stearne, together with some minor donations, nearly all of which accrued during the last century. The present number of volumes is about 18,000 printed, and 193 manuscript. Of late years Marsh's Library has been under excellent officers, and is very freely accessible, but it has long been starved for want of means to keep pace in any degree with the growth of literature. Whilst, on the other hand, the Library of the King's Inns, Dublin, which has always been conspicuous for its restrictive character, has already received in money, from the Consolidated Fund, L.8780; and, in money's worth, from authors and publishers, a further sum of nearly L.10,000, without any *public* equivalent whatever. The naïve remark of Mr Duhigg, the historian of the King's Inns, that "the genius of jobbing occasionally gives birth to a public-spirited establishment"⁵ could, by no ingenuity, have been more singularly misplaced.

The number of printed volumes in the King's Inns Library in January 1849 was 80,938, and that of MSS., 150.⁶ The Library of the Royal Dublin Society, founded in 1781, contains about 24,000 printed volumes, is eminently rich in the Dub-works on natural history, and has some valuable manuscripts, including the important collections of Harris, the historian of Ireland, which were purchased by Parliament of his widow for L.500, and committed to the Society's keeping. The Royal Irish Academy, founded in 1782, has a library of 10,500 volumes of printed books, and about 500 MSS., independently of the Betham collection on Irish archæology, acquired in 1851 (and not yet completely arranged), partly by a public subscription, and partly from the funds of the academy.⁷

Both this library and that of the Dublin Society have been largely aided by parliamentary grants. Both, therefore, are of right, and for some years past have been, in practice, accessible to the public, under proper regulations. But, within the last year or two, the disadvantages of thus separating these storehouses of learning, furnished at public cost, have become increasingly apparent; and powers have been judiciously taken, in framing the recent Act of Parliament for erecting an Irish National Gallery, to combine these collections with that of Archbishop Marsh, on obtaining the consent of their respective guardians, and

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¹ Parr, *Life of Ussher*, p. 102. The Ussher collection did not reach Trinity College until after the Restoration. Parr says that, whilst it was in Dublin Castle, "many of the books, and most of the best MSS. were stolen away."

² Rev. Dr Todd (principal librarian) "Answers to Inquiries of the Dublin University Commission" (*Report, &c.*, pp. 171-178, July 1852).

³ *Statuta Bibliothecæ . . . Trinitatis, &c.*, p. 17.

⁴ Duhigg, *History of the King's Inns* (Dublin, 1806), p. 525.

⁵ Estimates for Civil Services, for the year 1852-53, No. 4.

⁶ Whitelaw and Walsh, *History of Dublin*, p. 940.

⁷ Parliamentary Return of 1849, *ut supra*.

Act of Parliament for combining the smaller libraries into one public library for Dublin (1854-55).

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with all due precautions for the strict observance, both of that prelate's trust and of the proper associative purposes of the other bodies concerned. The new incorporation is to be designated "The Joint Trustees of the National Gallery of Ireland and of Marsh's Library."¹ By this union of so many scattered public collections a fine library of nearly 60,000 volumes—including a body of materials for Irish history of the greatest value—will be at once created. The duplicates may be made the basis of a good lending collection; and should the new institution be wisely worked under the rate-laying powers of the Irish Libraries Act, or under such modifications of those powers as may meet the special circumstances of the case, Dublin may soon possess a great public library worthy of the name. With the library of the King's Inns, Parliament will have to deal hereafter.

Free public
libraries in
the United
Kingdom,
established
under the
Acts of
1850-55.

Under the "Public Libraries Act" of 1850, or under the supplementary acts that have followed it, of which the "Irish Libraries Act" just referred to is one, free rate-supported libraries have already been established, or are now maintained, in the following cities and towns, namely,—Manchester, Liverpool, Salford, Boston, and Warrington (in *Lancashire*); Oxford; Cambridge; Westminster; Norwich; Winchester; Sheffield; Litchfield; Kidderminster (*Worcestershire*); Leamington (*Warwickshire*); Birkenhead (*Cheshire*); Ennis (*Clare*); and Dundalk (*Louth*). At Birmingham, Cheltenham, Exeter, Haslingden (*Lancashire*); Hull; in the metropolitan parishes of Islington and of St Mary-le-Bone; and in the city of London, propositions for the adoption of the act have been, for the present, negatived. By the corporations of Bristol, of Newcastle-on-Tyne, and of Preston (*Lancashire*), preliminary steps with a view to the ultimate adoption of the act have been initiated. Similar steps have also been taken in Aberdeen, at the instance of the present Lord Provost (John Webster, Esq., Advocate); and, we believe, in some smaller towns and in parishes in various parts of the United Kingdom.

Free library
of
Manchester

The city of Manchester was the first to establish a Public Library under the Act of 1850. Small collections of books, attached to museums of natural history, had previously been established (under Mr Ewart's "Museums Act" of 1845), by the town council of Warrington, in 1848; and by that of Salford in 1849 (at the recommendation of the late Mr Brotherton, M.P., whose attention had been called to the subject at the sittings of the "Select Committee on Public Libraries," which commenced its inquiries early in that year). But no power to levy rates, avowedly for the support of libraries, existed in the United Kingdom until 1850. The movement in Manchester was originated in the course of that year by Sir John Potter, then its mayor, and a public subscription was raised, which ultimately amounted to L.12,823. Out of this sum a building was purchased and adapted to its new purpose; and L.4156 was spent in books. The number of volumes so obtained was 18,028, and the number presented, by various donors, 3292. A poll of burgesses on the question of permanently maintaining the library by rate, under the Act, was taken 20th August 1852. The ayes were 3962, and the noes 40. The library was transferred to the Corporation, as an inalienable public institution, on the 2d September following, and was then opened as a consulting library to all comers (without any recommendation, or other preliminary); and as a lending library, to all persons producing a sufficient voucher of responsibility. It was the first library in the kingdom which offered these facilities; and during the first four years of its

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working, it has issued to readers and to borrowers, collectively, 584,792 volumes. During the same period, 11,255 volumes were added to the library, partly by purchase and partly by gift. Of the aggregate issue above mentioned, 322,103 volumes were lent to borrowers, and all the uncompensated loss which has fallen on the Corporation in consequence of this unprecedented freedom of circulation,—independently, of course, of fair wear and tear,—will be fully covered by a sum of 25s. The increased library rate of one penny in the pound will produce, in Manchester, L.4000 a-year, part of which sum will shortly be applied to the establishment of branch lending collections in other parts of that city. The total sum hitherto raised by rate amounts but to L.7485. The total contents of the library, in October 1856, were 32,573 volumes; the classification of which is as follows:—I. *Theology*, 1062; II. *Philosophy*, 421; III. *History*, 11,371; IV. *Politics*, 6830; V. *Sciences and Arts*, 2885; VI. *Literature and Polygraphy*, 10,004. Thus, it will be seen, 18,000 volumes out of 32,000 are either historical or political. This preference has been deliberately given, for the reason, that the selection of two or three principal departments of literature, as the main characteristic of the library, will enable the city council, in course of time, to make the collection one of the highest class and value, as respects those departments; whilst, on the other hand, the formation of an encyclopædical library, of equal value in all departments, would have been an aim too wide to be thoroughly attained. The library is frequented by *all* classes of the community, from those of least, up to those of greatest education. Merchant and artizan, mill-worker and clergyman, may be seen reading at the same tables; and as this (in Great Britain) is one of the most novel, so will it, in its ultimate issues, prove to have been one of the most pregnant results of rate-supported libraries, maintained by the payments of all classes, for the permanent use, the mental recreation, and the spiritual elevation of them all.

Liverpool, though second in the start, bids fair to be, in some respects, first at the goal. Its Free Library was established under a special Act,² which provided alike for the library, for the noble museum of natural history, bequeathed to the town by the late Earl of Derby, and for its botanical gardens. A sum of L.1400 was subscribed (for the purchase of books); the further sum of L.21,846 has been voted by the town council. This library, under regulations copied from those of Manchester, was publicly opened on the 18th October 1852, with a collection for use within the building, of 11,877 volumes; and, on the 18th October 1853, with two branch collections for the loan of books, in the northern and southern districts of the town, containing, together, about 2000 volumes. The reference collection has now increased to 21,020 volumes, and the two lending collections to 13,254 volumes, making an aggregate of 34,274 volumes. The total issues from the former have been 526,801, and from the latter, 364,347 volumes. Out of the issue to borrowers, but four books have been lost without replacement by the losers. As to the Reference Library, "the conduct of the readers," says the last Report, "and the care taken of the books, have been beyond all praise. Many of the artisans have expressed their gratitude and high appreciation of the privilege of consulting the valuable works in their various departments, more especially in ship-building, . . . cabinet and iron-work, and in various branches of practical science."³

This great success has necessitated the erection of a new and large building. The town council, early in 1856, ad-

¹ *An Act for the Establishment of a National Gallery, and for the care of a Public Library . . . in Dublin*, 17th and 18th Vict., c. 99. This act has been amended as to the governing body by the 18th and 19th Vict., c. 44 (*Statutes of the Realm*, 4th edition, vol. xxiii., pp. 211-215, and 584-585; 1855).

² *Liverpool Library and Museum Act*, 1852.

³ *Fourth Annual Report to the Town Council of Liverpool* (Oct. 1856), p. 5.

British
libraries.

vertised for designs for such an edifice, and a collection of drawings, or sketches, from not fewer than 115 architects, was sent in. A second competition by 16 selected architects was invited, and the designs received were exhibited in St George's Hall. But the assigned limit as to cost was greatly exceeded by those designers whose projects best pleased the eyes of the committee. Great difference of opinion existed in the town council, and a third series of plans was about to be invited, when Mr William Brown, M.P. for South Lancashire, offered to take the whole charge of erecting the building upon himself. The plan which he is understood to have approved, cannot, it is stated, be carried out at a less cost than L.25,000. The first stone of the new structure is to be laid in April 1857.

Munificent
gift to Li-
verpool of
W. Brown,
M.P.Free lib-
raries of
Salford and
of Bolton.

Salford, which had continued to increase the small but useful reference collection attached to its excellent museum, opened its Free Lending Library in May 1854. The former contained, in November 1856, 12,603 volumes, and the latter 5952 volumes. The aggregate issues from both collections up to the date last named, amount to 476,825 volumes. The working of the library has been so satisfactory that a large expenditure has been incurred to increase the accommodation for readers, as well as that allotted to the museum. A total sum of L.7942 has been raised by subscription, for books and building purposes; and a further amount, somewhat exceeding L.6000, has been raised by rate, or voted by the town council. Even in the small town of Bolton, a sum of L.3195 has been raised by subscription, and a further sum of L.1500 by rate; a library of 15,000 volumes has been formed, partly for reference and partly for circulation; and the aggregate issues in three years have exceeded 285,000 volumes.

In the cities and towns of the S. and E. of England the working of the Library Acts has been too recent to afford results similar to those of which we have thus given an abstract for some of the towns of the N. But the experience of all, so far as it has extended, is highly satisfactory. There is, however, one point, more especially affecting the southern and eastern towns, which claims brief notice, inasmuch as it possesses practical and present interest. We refer to those few existing town libraries of ancient foundation, several of which might usefully be made the ground-work, and others the adjuncts, of free libraries supported by rate.

Ancient
town lib-
raries in
England.

In every instance, we believe, save one, these old libraries have fallen into neglect. Ipswich has a small collection which dates from 1580. In Norwich a public library was founded in 1608, and was afterwards much augmented by several benefactions.¹ In Bristol another was founded by Robert Redwood in 1615.² In Manchester, Humphrey Chetham, an eminent clothier, founded a library in 1653, and gave it, by his last will, a considerable endowment. A century later, Dr Shepherd, the biographer of Poggio Bracciolini, founded a town library at Preston. There are other small town libraries which cannot here be enumerated. Parochial libraries—of more than a hundred of which we have before us a chronological list—must also be passed over, with the bare remark that a great many of the latter were intended more especially for the use of the clergy, as parsonic heir-looms, so to speak; and that it was with a view to the preservation of these, for succeeding incumbents, that the Act of the 7th Anne, c. 14 (*An Act for the better preservation of Parochial Libraries in that part of Great Britain called England*), was passed in 1709.³

Parochial
libraries.

Both at Bristol and Norwich, the intentions of the founders have been utterly set aside by the unwarrantable trans-

fer of these city libraries to private societies, composed of shareholders and subscribers. But, in both instances, a vote of the municipal councils will suffice to restore them to their proper purpose. Neither possesses any present maintenance fund; both contain valuable books, and will make excellent foundation-stones for free libraries. At Preston the Corporation is already prepared to take this step. The case of Manchester is peculiar. Chetham's Library is the only town library of the seventeenth century which possesses a serviceable endowment, but even here the amount and efficiency of it have been seriously impaired, partly by reason of the subsisting connection between the library fund and that of the school of the same founder,—a school which has been productive of great good to the district, but which, to some extent, has thriven by impoverishing its neighbour,—and partly by reason of large expenditure on the restoration of the curious old baronial hall, of which both library and school are the occupants. This library possesses 18,200 printed volumes, and 137 manuscripts. It is rich in historical works (up to the middle of the last century, indeed, it is a fine collection); but its good old books lack those good new books without which they lose half their proper value. There is, however, some reason to hope that the precedent about to be set in Dublin will have its due influence in Lancashire, as well as in Norfolk and Gloucestershire.

British
libraries.Chetham's
library,
Manchester.

(2.) FOREIGN LIBRARIES.

Having described the principal libraries of Great Britain and Ireland, we shall now proceed to those of foreign countries, and, in particular, endeavour to give some account of the principal collections in France, Spain, Italy, Germany, Holland, Belgium, Switzerland, Poland, Russia, Denmark, and Sweden. This account, however, must necessarily be brief and imperfect; for, owing to the magnitude of the subject, the space we can devote to the whole would scarcely be sufficient for an adequate description of the treasures contained in the Vatican and in the Imperial Library at Paris.

I. FRANCE.

The libraries of France may be divided into those of the capital, and those of the departments. The principal libraries of the capital are,—the Imperial Library, the Mazarine Library, the Library of the Arsenal, the Library of St Geneviève, the Library of the Sorbonne, the City Library, and the Libraries of the Senate, the Legislative Body, the Council of State, the Institute, and the Louvre. The libraries of the departments are 338 in number, exclusively of those which are specially annexed to learned bodies, to establishments of public utility, to colleges, and other institutions.

The Imperial Library at Paris is justly considered as the finest in Europe. It was commenced under the reign of King John, who possessed only 20 volumes; but the number was so increased by his successor, Charles V., who constructed a library in one of the towers of the Louvre, that, at his death in 1380, they amounted (according to Le Prince)⁴ to 910 volumes, several of them superbly illuminated by John of Bruges, the best artist in miniatures of that time. This precious collection was nearly destroyed during the troubles in the reign of Charles VII.; but what remained was recovered and greatly improved by Charles VIII., who added to it the choice books—still to be identified by the curious

Libraries
of France.Imperial
library at
Paris.

¹ Blomefield, *Essay towards a Topographical History of Norfolk*, vol. iv., p. 343.

² Tovey, *The Bristol City Library,—its Founders and Benefactors*, p. 4; and Barrett, *History of Bristol*, p. 507.

³ *Statutes at large* (Raithby's edition), vol. iv., pp. 18, 19.

⁴ *Essai Historique sur la Bibliothèque du Roi aujourd'hui Bibliothèque Impériale* (nouvelle édition, 1856, 12mo), p. 12. But compare Van Praet's edition of the *Inventaire des livres du Roy nostre Sire, estans en son Chastel du Louvre*, which was drawn up by Gilles Mallet in 1373. The original is still visible in the Imperial Library (Fonds de Colbert, No. 83).

French
libraries.

visitor—which he carried off to France, after the conquest of Naples. Francis I. united it in 1544 with that of Fontainebleau, which had been enriched by valuable Greek manuscripts brought from the East. Henri IV. was also a munificent benefactor. He appointed the celebrated historian De Thou to be keeper; brought the Royal Library back to Paris, after an absence of nearly a century (it had been removed to Blois before its transfer to Fontainebleau); and added to it the fine collection of MSS.—more than 800 in number, and chiefly Greek—which had been formed by Catherine de Medicis. From this period the Royal Library continued to receive constant accessions. In 1684 it possessed 50,547 volumes; at the death of Louis XIV., upwards of 70,000; in 1775 it amounted to 150,000; and by 1790 it had increased to about 200,000. Then came the enormous, and for a long time almost chaotic accessions which accrued from the revolutionary confiscations. At present it contains about 815,000 printed volumes, and 84,000 manuscripts.¹

In 1667, Louis XIV., having ordered all the medals and curiosities contained in the royal residences to be collected together, caused them to be deposited in this library. Learned antiquarians, sent into foreign countries, augmented this collection; rare and precious objects were successively acquired; and the library at present possesses the richest and most varied collection that exists in Europe. The cabinet of engravings, also founded by Louis XIV., is composed of paintings on vellum, drawings, and an immense collection of prints, from the discovery of engraving to the present time. It contains more than 1,500,000, arranged in about 12,000 volumes and portfolios. In these numbers is included a noble series of portraits, exceeding 60,000, arranged, as far as possible, in chronological order. A second and still larger collection of portraits, formed by the Debures,—nearly 67,000 in number—has been recently purchased, and arranged in alphabetical order. Large selections of prints are constantly exhibited to all comers, under glass.

Organiza-
tion of the
Imperial
library.

The Imperial Library is at present divided into the following departments, viz.,—1st, Printed Books; 2d, Manuscripts, Charters, and Deeds; 3d, Coins, Medals, Engraved Stones, and other antique monuments; 4th, Engravings; 5th, Maps, Charts, and Plans. These five departments form five distinct establishments, which, by their importance and the richness of their treasures, exceed everything of the kind that is, as yet, to be found in other countries. A decree of 1556, which fell, or partially fell, into desuetude during the troubles of the Fronde, but was renewed in 1689, imposed on publishers the obligation of furnishing to the Library of the King, copies of all works printed with copy-right; and each copy was required to be bound. At present the law prescribes the deposit of copies of all books (as well as maps and engravings) printed; but the other condition is dispensed with.

The additions from the Vatican Library, selected by the French commissioners in 1797, were particularly valuable, amounting to 501 manuscripts. Of these, 20 were Hebrew; 40 Syriac; 19 Coptic; 11 Chinese; 133 Greek, amongst which was the celebrated *Codex Vaticanus* of the Septuagint; 176 Latin, including the famous Virgil, Terence, Horace, Cæsar, Plautus, and other ancient classical manuscripts; besides many other manuscripts illustrative of the

history of the ninth and tenth centuries. Numerous manuscripts in modern languages were also seized in virtue of the compulsory treaty of Tolentino, particularly the *Commedia* of Dante, transcribed by Boccaccio, the *Arcadia* of Sannazaro, Michael Angelo's *Letters*, and also those of Henry VIII. and Anne Boleyn; besides 136 early printed books, 13 Etruscan vases, and 737 ancient coins. To these were added the manuscripts and early printed books collected by the French in other parts of Europe, to which their victorious eagles had penetrated. But the events of 1814 and 1815 were followed by a large restitution of the literary treasures, as well as of the works of art, acquired by right, or rather by abuse, of conquest. Of the contents of this magnificent collection,—named successively *Bibliothèque du Roi*, *Royale*, *Nationale*, and *Impériale*,—it would far exceed our limits to give any details, or even to enumerate the choicest articles. Of books printed on vellum, it contains at once the finest and most extensive collection in the world.² Dr Dibdin, who visited the library in 1821, has devoted a considerable portion of the second volume of his *Bibliographical Tour* to a description of some of the chief literary and artistic treasures accumulated in this library, accompanied with numerous illustrations selected from some of the most precious manuscripts. Excepting on Sundays and holidays, the Imperial Library is open daily, from ten until three o'clock. Every book is brought that can be found; and literary men of known respectability are permitted to take books to their own residences.

French
libraries.

Hitherto there has been no complete catalogue of this vast collection. That of Labbe, printed in 1653, in 4to, treats of some manuscripts, which are divided into historical and chronological, biblical and theological, epistolary and diplomatic, technical and philological. Anicet Melot's catalogue of the manuscripts in the Royal Library was printed at Paris, 1739–1744, in 4 volumes folio. The first volume contains the Oriental manuscripts; the second the Greek manuscripts; the third and fourth comprise those in the Latin language. Besides these, the collection has furnished the materials for a work, published in successive volumes, by the Academy of Inscriptions, under the title of *Notices et Extraits des Manuscrits de la Bibliothèque du Roi* (or *Nationale*) et autres Bibliothèques. The 1st volume is dated 1787, the 17th, 1851, in 4to. This, however, is rather a collection of dissertations, and rescriptions of particular manuscripts, than a descriptive catalogue. The French manuscripts are described with great accuracy by M. Paulin Paris, in his work, *Les Manuscrits Français de la Bibliothèque du Roi*, Paris, 1836–1848, 7 vols. 8vo.

Of the printed books in the then Royal Library, there appeared a catalogue compiled by the Abbés Sallier, Boudot, Capperonnier, and others, in 6 vols. folio, Paris, 1739–1750. It contains the classes Theology, Belles-Lettres, and part of Jurisprudence. After the lapse of a century, the want of a general catalogue having been felt, the deficiency is about to be supplied, by direction of the present Emperor. The task has been undertaken with energy, and carried on with an amount of success worthy of the collections which have accumulated. The new catalogue commences with the class of French History. It is printed in large 4to, in double columns, the books chronologically arranged under the different reigns or periods of govern-

¹ These numbers are based on the official return made in 1850, by General De La Hitte (then Minister of the Interior), to Lord Normanby, in consequence of an application from the Foreign Office (at the instance of Mr Ewart's Committee on Public Libraries). This return says, "700,000 printed volumes, and 500,000 tracts." The latter may be estimated as at least equal to 5,000 volumes. The yearly increment from copy-tax alone, is further stated to be 12,000 volumes. The number of MSS. is reported at "8 707 volumes, and 300,000 charters," &c. M. Grün ("Archiviste de la Couronne"), in his excellent *Dictionnaire de l'Administration Française* (1854), says, "More than 800,000 printed books, and 80,000 MSS."

² The number of books printed on vellum, contained in the Royal Library at Paris, amounts to 1467, exclusively of those restored in 1814 and 1815. The total number of books of this sort extant does not exceed 2700. Lord Spencer's collection, which is the richest in this country, contains only 108. (Van Praet, *Catalogue des Livres imprimés sur Vellin de la Bibliothèque du Roi*, Paris, 1822, in 6 vols. 8vo.)

French
libraries.

ment. The three volumes already published, 1855-56, according to an enumeration prefixed, include 45,729 articles. The fourth volume, which completes the class, is in the press, and will be followed by other classes or divisions. The manner in which the work is executed is worthy of imitation by the Trustees of the British Museum, and of all other great national libraries.

Mazarine
library.

This library was founded by Cardinal Mazarine. The formation of it was intrusted to the learned Gabriel Naudé, who, having first selected all that suited his purpose in the booksellers' shops in Paris, travelled into Holland, Italy, Germany, and England, where the letters of recommendation of which he was the bearer enabled him to collect many very rare and curious works. In 1648 this collection consisted of 40,000 volumes, and was already a public library by its owner's liberality; though that of the king did not become one until 1737. In 1660, Cardinal Mazarine, by his will, bequeathed it to the college which he founded, and which, until the epoch of the Revolution, bore the name of the founder. At present it contains about 132,000 printed volumes, and nearly 3000 manuscripts. It is remarkable for a great number of collections containing detached pieces and tracts, which date as far back as the fifteenth century, and exist nowhere else; nor has any other library so complete a body of the ancient books of law, theology, medicine, and the physical and mathematical sciences. It also possesses a most precious collection of the Lutheran or Protestant authors. The Mazarine Library is habitually frequented by from twenty to eighty readers, according to the season of the year. It is supported by an annual grant of about L.1300, provided for in the budget.¹

Library of
the Arse-
nal.

This library, founded by the Marquis of Paulmy, formerly ambassador of France in Poland, was, in 1781, acquired by the Count d'Artois, who conjoined with it a portion of the Library of the Duke of La Vallière. It consists of more than 202,000 printed volumes, and about 6000 manuscripts. It possesses the most complete collection extant of romances, since their origin in modern literature; of theatrical pieces, or dramas, from the epoch of the moralities and mysteries; and of French poetry since the commencement of the sixteenth century. It is less rich in other branches, but it has all works of chief importance, and, in particular, contains historical collections which are not to be found elsewhere. The Library of the Arsenal has always attracted the attention of the learned from all parts of Europe. It is constantly frequented by from forty to fifty readers, who there apply themselves to scientific and literary researches. The annual grant for its support was, in 1850, 36,000 francs, or L.1440.²

Library of
St Gene-
viève.

The foundation of this library dates from the year 1624, when Cardinal de Rochefoucauld, having reformed the community of Sainte-Geneviève, made it a present of 600 volumes of books. In 1687 the abbey is said to have had already 20,000 printed volumes, and 400 volumes of manuscripts. In 1710 Letellier, Archbishop of Rheims, bequeathed to it all his books.³ At the epoch of the Revolution, it possessed 80,000 printed volumes, and 2000 manuscripts; at present it contains nearly 180,000 volumes, and 3500 manuscripts. In it may be found the principal academical collections, and a complete set of Aldines. It is particularly rich in historical works; and its most remarkable manuscripts are Greek and Oriental. Its typographical collections of the fifteenth century are not more valuable for

their number than for the high state of preservation in which they are found. This fine library is daily frequented by upwards of 300 persons, including many students in the different faculties. It is supported by an annual grant from the public treasury of 75,200 francs, or upwards of L.3000;⁴ and has recently been placed in a new and handsome edifice, erected for its accommodation. The reading-room of this building is the most convenient and capacious one in Paris, as the library itself is the most frequented.

French
libraries.

The City Library is supported by grants from the funds of the municipal council. The foundation dates but from the beginning of the present century; Paris having lost its original City Library, by one of the incidental results of the Revolution. The first books for the new collection were obtained, however, in great measure, from the revolutionary confiscations; and were afterwards augmented by the exertions of the Prefect of the Seine, and of some of the municipal authorities. In 1827 it had grown to 45,000 volumes, and now possesses at least 55,000. The Library of the Palace of the Luxembourg (formerly that of the Chamber of Peers), contains nearly 40,000 volumes, and has allotted to it a sum of 10,000 francs for the purchase of books and to defray the expense of binding. The University Library, which is placed in the buildings of the Sorbonne, consists of 40,000 printed volumes, and 1000 MSS. It is very useful to the students of the different faculties, who frequent it in the intervals between the lectures. It expends annually a sum of about L.1100.⁵

Other pub-
lic libraries
of Paris.

The nucleus of the present Library of the Institute was the old City Library (*Bibliothèque de la Ville*), founded by the eminent magistrate, M. Morieau, who died in 1759, bequeathing to the municipality his collection of 14,000 printed volumes, and 2000 MSS., on condition that it should be publicly accessible. To this gift a liberal addition was made by M. Bonamy, the first and eminently learned librarian. The Library of the Institute having been plundered during the first Revolution, that of the City was transferred to it, by way of compensation. At present this excellent and useful collection amounts to more than 80,000 volumes. It exhibits the best possible selection of the principal works in all the important branches of human knowledge; and it may be truly said that it is kept up to the actual state of science and learning. In the acquisitions which are made, the object is not to search for rare editions, but to obtain such as possess some peculiar merit. Academical collections of all kinds and of all countries, magazines and journals of science and literature in all languages, are to be found here in greater number than anywhere else. This collection is reserved for the members of the five academies of which the Institute is composed; but all strangers presented by them are admitted, and it is *de facto* public.

Library of
the Insti-
tute.

The provincial libraries of France, as they are chiefly supported at the expense of the different cities, are naturally placed under the immediate direction of the mayors and municipal councils; but they are not the less on that account under the superintendence of the superior authority of the Minister of Public Instruction. Their number, as already stated, amounts to 338, exclusively of those attached to societies, colleges, and other institutions. Amongst the most considerable are those of Strasburg, which, at the date of the latest official returns, contained about 180,000 printed volumes, and 1589 MS. volumes; Lyons (120,000 printed, 1518 MSS.); Rouen (110,000 printed, 2355

Provincial
libraries.

¹ General De La Hitte to Lord Normanby, 18th March 1850 (App. to *Report from Select Committee on Public Libraries*, 1850), pp. 176-259. Of the original formation of this library, some curious notices have been collected in the 6th volume of that valuable work of M. Paulin Paris, which we have mentioned on the preceding page.

² According to the notice of Letellier, by Weiss, published in the *Biographie Universelle* (vol. xxiv., pp. 338-339), his bequest was of no less than 50,000 volumes. There is an excellent catalogue of the collection by Nicolas Clement (*Bibliotheca Telleriana*, 1693, folio), to which the Archbishop himself prefixed an account of its formation.

³ *Projet de Budget révisé des Dépenses de l'Exercice* 1850 (Paris, 1849), cxxvii. Comp. De Bougy, *Histoire de la Bibliothèque Sainte Geneviève* (1847), p. 149.

⁴ Ibid.

⁵ Ibid.

Foreign MSS.; Troyes (about 100,000 printed, 3000 MSS.); Aix (95,000 printed, 1062 MSS.); Grenoble and Besançon (each containing about 80,000 printed volumes, and 1500 MSS.); Avignon (60,000 printed, 1200 MSS.); Versailles (55,924 printed, 115 MSS.); Amiens (53,000 printed, 600 MSS.); Marseilles (51,219 printed, 1335 MSS.); Toulouse, Dijon, and Nismes (each with about 50,000 printed volumes, and of MSS., 700, 500, and 207 respectively); Nantes (45,000 printed, 187 MSS.); Caen (40,107 printed, 226 MSS.); Le Mans (40,000 printed, 700 MSS.); Rennes (40,000 printed, 220 MSS.); Arras (36,772 printed, 1137 MSS.); Douay (36,500 printed, 970 MSS.); Chaumont (35,000 printed, 160 MSS.); Colmar (34,859 printed, 481 MSS.); Cambrai (33,133 printed, 1254 MSS.); Orleans (33,000 printed, 486 MSS.); Rheims, Soissons, Nancy, Beaune, and Montpellier (each with about 30,000 volumes of printed books; and with 1300, 293, 265, 160, and 68 volumes of MSS. respectively.¹ The MS. collections of Troyes (a library founded expressly for public use, as early as 1651), Grenoble, Besançon, Aix, Rouen, Nantes, Rennes, and even those of the comparatively small libraries of Montpellier and Auxerre, are rich mines of lore never yet thoroughly explored. The catalogue of the manuscripts in the Library of Lyons, 1518 in number, is one of the most interesting which has issued from the French press (*Paris et Lyon*, 1812, in 3 vols. 8vo). The preliminary disquisition contains notices of the former libraries of Lyons; the historical essay on manuscripts contains an account of the materials anciently used in writing; the biography of writers who have treated of the subject, though brief, is worthy of attention; and the manuscripts are classed and described with much judgment and learning.² At Rouen is the remarkable missal, written by a Benedictine monk, who died in 1714, the work of thirty years; also, St Guthlac's famous missal of the eleventh century, and the still earlier *Benedictionarius*.³

In the extensive series published at the expense of the French government, *Documents sur l'Histoire de France*, we find the commencement (in 2 thick volumes 4to), of a *Catalogue Général des Manuscrits des Bibliothèques Publiques des Départements*, under the direction of the Minister of Public Instruction; Paris, 1849-1855, 2 vols. 4to.

The small Library of Vire,—the antique and craggy little capital of the Bocage of Normandy,—merits at least a word of notice, on account of the singular circumstances which attended its formation. The founder, Thomas Tyrrel, a Frenchman by birth, was an Englishman by naturalization as well as by predilection. He formed his library in London, during a residence of more than twenty years, and bequeathed it to Vire, his birthplace, by his last will. There it remained in cases untouched for nearly as long a period, when, by a lucky accident, it attracted attention, and was made the nucleus of a useful library.⁴

II. SPAIN.

Spanish The number of public libraries in Spain is greater than libraries. has commonly been supposed; nor have the science and literature of that country quite sunk to such a state of depression as some have been pleased to represent. Its principal library is the *Biblioteca Real*, at Madrid, which is

now lodged in an edifice, once the mansion of the Alcanices family, on the Plaza del Oriente. It is open to all comers, as far at least as the printed books are concerned. The reading-tables are placed in three spacious apartments, corresponding to as many sides of the edifice, which is built round a court, with a fine staircase in the centre; in the middle of these rooms are rows of tables provided with writing materials and chairs; and against the walls are the book-shelves, numbered and tastefully ornamented. The catalogues are kept in a small room apart, where there are two or three persons in attendance to answer the inquiries of the stranger, and to furnish him with the number and shelf where any particular work may be found. The service of the library is excellent. The Royal Library contains about 200,000 printed volumes, and from 2000 to 3000 manuscripts, amongst which are many valuable Greek, Latin, and Arabic manuscripts, and inedited works, chiefly Spanish. The *Monetario*, or cabinet of medals, is arranged in an elegant apartment, and contains an unrivalled collection of Celtic, Phœnician, Carthaginian, Greek, Roman, Gothic, Arabic, and modern coins and medals, in excellent preservation. "Le cabinet des médailles de Madrid," says M. Faure, "est sans doute le plus remarquable de l'Europe. Tandis que Paris, qui l'emporte si incontestablement sur la capitale des Espagnes par les monumens des arts et de l'antiquité, n'a que cent mille médailles dans sa collection, il y en a cent quatre-vingt-trois mille dans celle de Madrid: cent cinquante mille sont classées dans l'ordre le plus parfait; trente-trois mille seulement restent à classer. Ces preuves matérielles du passage des Celtes, des Tyriens ou Phéniciens, des Carthaginois, des Romains, des Vandales, des Suèves, des Alains, des Goths, des Maures sur cette malheureuse terre qu'ils se sont arrachée les uns aux autres, réconcile avec les Espagnols, dont on a d'ailleurs tant d'occasions d'accuser l'indifférence. On trouve dans cette collection précieuse de quoi applaudir au zèle de ceux qui l'ont formée et de ceux qui l'entretiennent avec tant de soin."⁵ A more recent traveller, speaking of the *Biblioteca Real*, says, "It is one of many institutions which awaken the admiration of the stranger in Spain, as being at variance with the pervading decay."⁶ Mr Ford, however, tells us that "good modern books are here, as in most other Spanish libraries, the thing needful."⁷ The only catalogue that has been printed is volume first of the Greek manuscripts, by D. Juan Yriarte (Madrid, 1769, folio); and no second volume has ever appeared.

There is another extensive but chaotic library, "one of the many treasures buried in Spanish napkins," where, according to Mr Ford, "are left to the worms, some 100,000 volumes," . . . including the "secret correspondence of Gondomar, during his embassy to England, with the identical letters received from the lords, ladies, and gentlemen, whom he bribed for Philip III., as Barillon did afterwards for Louis XIV. His letters, likewise, on lighter social subjects are extant. This buried mine of the Shakspearian period, which clamours for a Collier, lies unexplored in the private library of the Crown."⁸

The convent of the Escorial, situate upon the southern declivity of the Guadarrama chain, about half way up the mountain, owes its existence to a vow made by Philip II. during the crisis of the battle of Saint-Quentin in 1557. It

¹ Returns addressed by the prefects of the several departments to the French Ministry of Public Instruction, in the years 1853 and 1854, and of which an epitome was published in the *Journal Général de l'Instruction Publique* of the 15th Nov. 1854.

² *Reponses aux Questions, &c.*, App. to Report, *ubi supra*.

³ See Dibdin's *Bibliographical Tour*, vol. i., p. 165. He has by no means given an exaggerated account of these volumes.

⁴ From an interesting MS. notice of visits to French libraries, obligingly communicated by R. C. Christie, Esq., M.A., Professor of History in the Owens College, Manchester.

⁵ Faure, *Souvenirs du Midi, ou l'Espagne telle qu'elle est*, pp. 43, 44, Paris, 1831, 8vo.

⁶ *A Year in Spain*, vol. i., p. 243, et seq., London, 1831, 8vo.

⁷ *Hand-book for Spain* (3d edition, 1855), p. 721.

⁸ *Ibid.*, p. 581.

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derives its name from San Lorenzo del Escorial,¹ to whom it was dedicated, and has been often described. At present we have only to do with the literary treasures contained in this magnificent edifice. The library is 195 feet in length, 32 in breadth, and 36 in height. Its vaulted ceiling is ornamented with arabesques and colossal figures, by Pellegrino Tibaldi; the book-cases, of cedar, are beautifully carved, with painting in fresco, by Bartolomeo Carducci, emblematical of the several divisions of the works ranged upon the shelves. Of the contents of this library no trustworthy account is extant; it has been repeatedly said to contain 120,000 printed volumes (unquestionably a gross exaggeration; it is probable that at no time has it contained more than one-third of that number), and between 4000 and 5000 manuscripts, of which 567 are Greek, 67 Hebrew, and 1800 Arabic. The Arabic manuscripts were originally much more numerous,² but a large proportion of them was consumed by the fire which, in 1671, destroyed a great part of the library, and all that remains is the number just stated. Besides these, which are extremely curious, there are other manuscripts of great rarity and value, particularly one, *Codex Aureus*, containing the Four Gospels, written on 160 leaves of vellum, in gold letters, and supposed to be of the tenth century; a treatise by St Augustin, *De Baptismo Parvulorum*, said, by Spanish writers, to be in his own handwriting; the original works of St Teresa; and a parchment roll containing an original Greek manuscript by St Basil. The books are placed, with their backs to the wall, so that the edges of the leaves are turned outwards, and the titles of the works written thereon. This was the practice of Arias Montanus (who bequeathed his Greek, Arabic, and Hebrew MSS. to the Escorial, and his printed books to Seville); and the same absurd method has continued to be followed.³ There is no printed catalogue of the books; Casiri's very inaccurate catalogue includes only the Arabic manuscripts rescued from the conflagration of 1671, with a few others subsequently acquired. This catalogue, however, is in one respect valuable, inasmuch as each manuscript is not only enumerated, but its age and the author's name, when known, are also given, together with occasional extracts both in the original Arabic and in the Latin language.⁴

An excellent catalogue of the Greek MSS. by Miller, was printed at the expense of the French government, in 1848; for, to the honour of France, under all its changes of polity and administration, the promotion of learning is uniformly regarded as one of the public duties of a government, whatever its party complexion, and alike whether the political barometer may stand at "stormy," or at "set fair."

The number of provincial libraries in Spain is considerable; but (like too many of the libraries themselves) unprogressive. There is no official account of them of later date than 1835, when the more extensive and important were then stated to be those of Toledo (30,000

printed books), Salamanca (24,000, with 1500 MSS.), Santiago University at Corunna (17,307, with 41 MSS.), and Valladolid (13,250). At Malaga, Peruel, Murcia, Lugo, Cervero, Oviedo, Palma, and some other places, not to mention the library of the Asturian Institute, and that of the Junta of Commerce at Corunna,⁵ are collections of books varying from 3000 or 4000 to between 9000 and 10,000 volumes each.

Elsewhere than in Spain, the Columbian library at Seville would surely have grown into a very cynosure of book-lovers. At one time, it was so choice a collection as to be worthy of the great name it bears; but (*cosa de España*) the *tinea* and the *blattæ* had it so long to themselves, that they quite ruined many of its treasures, although it still possesses about 18,000 volumes; and, amongst them, a precious MS. in which Columbus tried to satisfy the Inquisition that his discovery had been scripturally predicted; it has also some books that were his cabin companions, and bear his MS. notes.⁶

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Amongst the libraries of Italy, that of the Vatican, at Vatican Rome, stands pre-eminent, not more for the grandeur and magnificence of its habitation, than for the inestimable treasures with which it is enriched. Pope Nicholas V. (1447), learned himself, and a distinguished patron of letters, is justly considered as the founder of the Vatican Library; for of the collections of his predecessors little remained when he ascended the papal throne, the books having been either lost or destroyed by the frequent removals from Rome to Avignon, and from Avignon to Rome. This pontiff added above 5000 manuscripts to the fragments of the original collection, placing all in the Vatican; and Calixtus III. is said to have enriched it with many volumes saved from the libraries of Constantinople, when that city fell into the hands of the Ottomans. The collection, however, suffered an almost total dispersion at the sacking of Rome, by the Duke of Bourbon, in the year 1527. Pope Sixtus V., a man of learning, and a zealous patron of the arts, rebuilt the library in 1588, and considerably augmented the collection. From this period it continued to increase in steady progression, receiving additions, almost every year, sometimes even of whole libraries, owing not only to the favour of the pontiffs and various princes, but also to the well-directed zeal of its librarians, many of whom have been men of eminent talents as well as of high rank and extensive influence. Under Gregory XV. an important addition was made by Maximilian, Duke of Bavaria, who, yielding to urgent entreaties and cunning devices, presented to that pontiff the old Library of Heidelberg, belonging to the Elector Palatine, which had been part of the plunder seized by Tilly at the capture of

¹ *Escorial* is formed from the Spanish word *escoria*, signifying *dross*. It is commonly applied to all places where there are old or exhausted mines.

² In a fortress belonging to the Emperor of Morocco, there were found, it is said, 4000 Arabic manuscripts, which were carried to Paris for sale; but not being prized in that capital, they were transported to Madrid, where about 3000, including the most valuable, were selected for the Library of the Escorial by order of Philip II. But we do not vouch for the story.

³ It is not a little singular, that in the return of the "Public Libraries and Archives of Spain," made to Lord Palmerston by Mr Villiers, and printed in the Appendix to the *Report on the British Museum* (p. 511, *et seq.*), no notice whatever is taken of the Library of the Escorial; whilst the regulations of a provincial library (that of the Junta of Commerce at Corunna) are inserted at full length.

⁴ The Library of the Escorial has always been difficult of access. Probably no library, containing such treasures, ever rendered so small service to literature; and none, perhaps, has suffered more severe losses, not alone by calamity, like fire, but from sheer plunder. When Los Santos wrote his *Description breve del Monasterio del Escorial* (1657), it certainly contained 18,000 volumes. It received considerable accessions, but most of them were antecedent to the destructive fire of 1761. Very soon after that event, Beaumarchais visited the library, and his keen observation detected an agency that was to prove more fatally obstructive of the growth of a great library than fire could be. The works of all our "modern philosophers," he says, are prohibited, and not only all that they have written, but "all that they may hereafter write." (Letter to the Duke of La Vallière, Madrid, 24th Dec. 1764, published in the *Revue des Deux Mondes*.) About 1809 it was removed to Madrid, and when restored by Ferdinand VII., nearly 10,000 volumes, according to Mr Ford, lost their way. Mr Inglis saw it in 1830, and says that it did not then contain more than 24,000 volumes. (*Spain in 1830*, vol. i., p. 347.)

⁵ See Appendix to the *Report on the British Museum*, pp. 514, 515, *et seq.*

⁶ Ford, *ubi supra* (p. 176).

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Heidelberg in 1622. Among other important additions that have a claim to notice are,—the greater part of the Library of Urbino, founded by Duke Federigo; a portion of the collection of the Benedictine monastery of Bobbio, composed chiefly of palimpsests; and the books and manuscripts of Christina, Queen of Sweden, comprising the treasures taken at Prague, Wurtzburg, and Bremen, by her father, Gustavus Adolphus. After her death at Rome, they came, by succession, to the family of Ottoboni. Pope Alexander VIII., as head of that family, in 1690, placed 1900 of the MSS. in one of the galleries of the Vatican, and gave it the appellation of *Bibliotheca Alexandrina*, in honour of the Queen, who had received the additional name of Alexandrina on abjuring the Lutheran religion. All the MSS. in the Vatican, anterior to the ninth century, and those with the choicest illuminations, to the number of about 500, were selected and conveyed to Paris in the year 1797, but the greater part were restored in 1815. Of the Palatine MSS., about 900 volumes, more than nine-tenths of them German, but among which were some early Greek MSS., were at length returned (in 1816) to the University of Heidelberg, where they now remain.¹

The magnificent library of the Vatican consists of three divisions or compartments, besides the vestibule; the anteroom, the double gallery, and the great saloon or hall. The vestibule contains Chinese works relating to geography and chronology, together with two columns bearing ancient inscriptions. The anteroom is appropriated to the two keepers of the library, and the secretaries, or interpreters, usually seven in number, who speak the principal languages of Europe, and who attend for the convenience of learned foreigners. In this apartment are also accommodated those engaged in translating from the Hebrew, Arabic, Syriac, Greek, and Latin languages; and it is open daily for the use of students, Sundays, Thursdays, and very numerous holidays excepted. Passing from the anteroom, the visitor enters a double gallery of 220 feet in length, on either side of which are arranged the Greek and Latin MSS. of the ancient Papal collection, which strangers at first conceive to be the whole library; but at its extremity there opens up, in almost interminable perspective, another gallery of about 1000 English feet in length.² As the visitor enters this gallery, or "great hall of the Vatican," he has on his right hand the Palatine and Urbino collections of MSS., and, beyond them, the general library of printed books; whilst, on his left, extend in succession the Oriental MSS.,³ the MSS. of Christina, the Ottoboni MSS., those bequeathed by the Marquis Capponi, and (last of all) the

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choice collection of printed books on the fine arts, nearly 5000 in number, formed by Count Cicognara, and purchased by Leo XII. for L.4000. These galleries and apartments, all vaulted and painted with varied effect by painters of different eras and talents, constitute the receptacle of this noble library. The books are nearly all kept in close cases; so that in the Vatican the stranger seeks in vain for that imposing display of volumes which he may have seen and admired in other libraries. Their number has never been officially and precisely recorded; and such is the discrepancy of the various accounts, that the printed books, by some reckoned not to exceed 30,000* or 50,000 volumes, by others are stated at ten times these numbers. This monstrous discrepancy has been occasioned partly by the want of a catalogue, and partly also by the books being kept in close cases. Valery, whose statements in other similar matters we have found to be trustworthy, and who appears to have had some facilities of access and examination, estimated them, in 1840, at 80,000 volumes. We are not now inclined to reckon them as exceeding 100,000 volumes; as the collection is not increased, like many other great libraries, by extensive and systematic purchases. Of the manuscripts, the same author fixes the number at 24,000, namely, 5000 Greek, 16,000 Latin and Italian (these last only in small number), and 3000 in various Eastern languages. The official return of 1850 says 25,000 MSS.

But the importance of a library is not to be estimated by the mere number of volumes. The great value of the Vatican Library consists in its manuscripts. Those usually shown to visitors impress the mind with no ordinary ideas of their inestimable value and importance, and include some of the highest antiquity, such as the Virgil of the fourth or fifth century, written in uncial letters, and illuminated with most curious miniatures; a Terence equally ancient; another of the ninth century, illuminated with ancient masks; the celebrated Greek Bible of the sixth century (*Codex Vaticanus*), written in capital letters, according to the Septuagint version, and from which all the subsequent copies have been taken; and the Gospels of St Luke and St John written in the tenth century, and bound in ivory. There is also the palimpsest, containing the treatise of Cicero *De Republica*, discovered by Cardinal Angelo Mai, conjectured to be of the third century; and perhaps, in the form of books, this, and the Virgil, are the oldest manuscripts in existence. Amongst the rare manuscripts in this splendid collection may also be mentioned, several Hebrew, Syriac, Arabic, and Armenian Bibles; a very large Hebrew Bible⁴ formerly in the library of the

¹ *Serapeum* (1845), vol. vi., pp. 157-8. The best account of the transfer and subsequent fortunes of the Palatine collection—not the least curious episode in the remarkable history of the Vatican Library—may be found in Dr Anton Ruland's elaborate essay, entitled, *Zur Geschichte der alten nach Rom entführten Bibliothek zu Heidelberg*, which occupied several numbers of the *Serapeum* in 1856 (vol. xvii., pp. 185-191; and 193-235). The reader should also consult, besides the well-known work of Wilken (into whose hands the partial restitution of 1816 was made), Theiner's *Schenkung der Heidelberger Bibliothek . . . und ihre Versendung nach Rom; mit original Handschriften*, published at Munich in 1844; but, in reading this work of the worthy Oratorian priest, he will do well to have beside him the keenly critical articles which appeared in the *Serapeum* of the following year (vol. vi., pp. 1-11; 113-127; 129-159), from the pens of Dr Gessert (of Munich), and of Dr Bahr (of Heidelberg). Dr F. L. Hoffman has also contributed an interesting paper (including an early Palatine catalogue), towards the elucidation of a subject which has always had special attractions for bibliographers, in the same *Journal* for 1850, vol. xi., pp. 161-173; 177-188; 193-208). Allatius wrote in Italian a tract on the conveyance of the Palatine Library to Rome, under his direction, which tract was translated into Latin by Quade, and published at Gryphiswald, 1708, 4to. (Leonis Allatii, *Instructio de Bibliothecâ Palatinâ Romam transportandâ*.) The writer takes pride in the fact that not a leaf of the library was lost on the road.

² *Rome in the Nineteenth Century*, vol. ii., p. 383, Edinburgh, 1822, 8vo.

³ Of the Oriental MSS. there is a valuable catalogue by J. S. Assemani, *Bibliotheca Orientalis Clementino-Vaticana, Roma*, 1719-28, 3 vols. folio. It is continued by Angelo Mai, in the fifth and subsequent volumes of his *Nova Collectio Scriptorum Veterum*. In Montfaucon's *Bibliotheca Bibliothecarum Manuscriptorum nova*, Paris, 1739, 2 vols. folio, is given a catalogue of Queen Christina's manuscripts.

⁴ Sir George Head, writing of repeated visits made to the Vatican in 1840 and 1841, says roundly, "The reputed contents of the whole establishment amount to 30,000 printed books, and 23,580 MSS. (*Rome, a Tour of many days*, vol. iii., p. 231.) Mr Curzon, on the other hand, a writer versed in such subjects, and also writing of visits in 1840, says, "about 100,000 printed books, and about 36,000 MSS." (*Notes on Italian Libraries*, privately printed in *Miscellanies of the Philobiblon Society*, 1855, pp. 34, 35). The official return obtained by our Foreign Office in 1851, runs thus:—"The present number of printed volumes is about 100,000; of MSS., 25,000. The number of tracts or pamphlets is reported to be incalculable."

⁵ "They think it to be of great antiquity, but . . . it is of A.D., 1294." (Montfaucon, *Diarium Italicum*, c. xx.) This visit of Montfaucon was in 1698. The MSS. were then, he was told, "nearly 12,000 in number."

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Dukes of Urbino, for which—though it is so ponderous as to require two men to carry it!—the Venetian Jews are said to have offered its weight in gold; a Greek manuscript containing the Acts of the Apostles, written in gold letters, and presented to Innocent VIII. by the Queen of Cyprus; a Missal written in 1118; another adorned with miniatures by Giulio Clovio, the scholar of Giulio Romano, and the finest miniature painter of his time; a large Breviary, ornamented with beautiful miniatures and presented to the library by Matthias Corvinus, King of Hungary; the *Annals of Baronius*, in 12 volumes, written with his own hand; several volumes of Ecclesiastical History, by the learned Onofrio Panvinio; a Martyrology, curious on account of its antiquity and its miniatures; a manuscript of Pliny, with fine miniatures of animals; a beautiful Dante adorned with exquisite paintings, begun by the Florentine school, and finished by Giulio Clovio; another Dante, the most precious that exists of the *Divina Commedia*, in the handwriting of Boccaccio, and sent by him to Petrarch, thus connecting the three great names of Italian Literature; also an autograph manuscript of the *Rinaldo* of Petrarch, with his corrections; and another autograph of Tasso, including a sketch of his *Gerusalemme Liberata*, written when nineteen years of age. To some English visitors, the most interesting volumes are the dedication copy, printed at London by Pynson, in 1521, on vellum, of Henry VIII.'s treatise against Luther, *Assertio Septem Sacramentorum adversus Mart. Lutherum*, with this distich in the king's autograph on the last page,—

"Anglorum rex Henricus, Leo Maxime, mittit
Hoc opus, et fidei testem et amicitiae;"—

(a work which obtained for that monarch his title of *Fidei Defensor*); and his Love Letters to Anne Boleyn, seventeen in number, nine in French, and eight in English, which have also found a place in this library. It is rich in early printed editions, and amongst those on vellum may be specified the Epistles of St Jerome, printed at Rome in 1468; Aulus Gellius, 1469; the Greek Bible of Aldus, 1518; one of four copies of the celebrated Polyglot Bible of Cardinal Ximenes, 1514–1517. This library possesses a very fine cabinet of medals, which was carried off by the French, but restored, after the events of 1814 and 1815. There is also attached to it a room filled with a fine collection of prints, to which admission can only be obtained by a particular order; and in another are deposited the secret archives of the Vatican, to which, of course, there is no admission at all. A cardinal is always nominal librarian. Of the difficult accessibility of this great storehouse, at almost all periods of its history, it were easy to adduce a long chain of testimony. Some years since, Cardinal Consalvi somewhat relaxed the prevailing restrictions, but the liberality scarcely survived its author. "The Papal government," writes Von Raumer, in 1839, "has returned to the old seclusion and exclusion."² "Of all the tombs in the world, the Vatican Library is the most impressive," says Mr Samuel Laing in 1842; . . . "Book-cases well stocked; no readers; no [accessible] catalogue."³ "The privilege of consulting books," says Sir George Head, a year or two later,

"is merely nominal, in consequence of the imperfect state of the catalogue; and, in point of fact, the multitudinous volumes on the shelves may be compared to a mine . . . whence only a few particular objects, considered as the staple curiosities of the region, . . . are extracted."⁴ Even the return to the inquiries of the Foreign Office, in 1851, after describing the authorized regulations as to access, adds, "There are few days in the year in which it is open to the public."⁵ In fine, there is ample evidence that this library has yet to be explored, and that an abundant harvest awaits those future inquirers who to the requisite skill may join inflexible perseverance and happy fortune.

The other libraries at Rome, of sufficient importance to deserve notice, are the Barberini collection, containing between 30,000 and 40,000 volumes of printed books, and about 7000 manuscripts. This collection was formerly open to the public, but has ceased to be so, "on account of extensive robberies which took place some years ago."⁶ (2.) The *Casanata* Library, bequeathed by Cardinal Casanate to the Dominican convent in the Piazza della Minerva, in 1700, together "with suitable funds to render it one of the first in Italy and Europe."⁷ It occupies magnificent apartments. According to the official return of Monsignore Barardi (1851), "the number of volumes exceeds 200,000," (not counting pamphlets, miscellaneous works, and plays, which exceed the number of 3000.) The accessibility of the library is liberal.⁸ (3.) The *Angelica* Library, founded by Angelo Rocca, and the first collection opened to the public in Rome (1604), containing 84,819 printed books, 2945 MSS., and 60,960 tracts (*opuscoli*).⁹ The number of persons frequenting it—no ticket of admission being requisite—is stated to be from 30 to 40 daily. It includes the collections of Pignoria, Holstenius, and Passionei. (4.) The *Alexandrine*, or "Sapienza" Library, founded by Alexander VII., also the founder of the library in the Chigi palace, (now, we believe, closed like the Barberini, save by special favour). It appears to contain about 80,000 printed volumes, and 3000 MSS. The reigning Pope has given permission, granted to no other library in Rome, for the keeping this library open to the public in the evening.¹¹ (5.) The *Corsini* Library, founded by Clement XII., occupies 8 rooms in the Corsini palace, and is stated to contain about 60,000 printed volumes, and 3000 MSS., with 60,000 engravings. Its manuscript collection is poor in classics, but abounds in documents illustrative of the history, both political and literary, of the sixteenth and seventeenth centuries.¹² (6.) The Franciscan, or *Aracelitana* Library, containing, according to Sir George Head (1841), 18,000 volumes;¹³ but according to the Foreign Office Returns (1851), though "despoiled of the greater part of its most valuable works after the French invasion, it has still from 40,000 to 50,000 volumes."¹⁴ (7.) The *Lancisiana* Library, founded in 1721, and placed in the Hospital of the Holy Ghost, with "from 30,000 to 40,000 volumes."¹⁵ (8.) The Library of the *Roman College* (Jesuits), said to contain 70,000 volumes;¹⁶ and, (9.) The *Vallicellana* Library (sometimes termed Library of the Oratory); chiefly noticeable for its manuscripts. They include many ancient classics of interest, and are singularly rich in materials for French history, especially in respect to

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Rome.

¹ Dennistoun, *Memoirs of the Dukes of Urbino*, vol. i., p. 422.

² F. von Raumer, *Italy*, vol. ii., pp. 119, 120.

³ Head, *Rome, a Tour of many days*, vol. iii., pp. 222–231.

⁴ Appendix to Report from Select Committee on Public Libraries, 1851, p. 41.

⁵ Mr Petre to Mr Scarlett, 2d June 1851 (*Foreign Office Returns*, 1851, p. 40).

⁷ 4000 Roman crowns (L.833), according to M. Beuchot (art. "Casanate," in the *Biographie Universelle*), is the revenue of this foundation, part of which is applied to theological tuition.

⁸ This number is somewhat startling, but the statement is clear and precise. There is, at all events, no doubt that, as respects printed books, the Casanata is the largest library in Rome.

⁹ Head, *ut supra*, vol. i., p. 317.

¹² *Archives des Missions Scientifiques*, tom. i., p. 376 (1850).

¹⁴ *Foreign Office Returns*, *ut sup.*, p. 43.

¹⁰ *Foreign Office Returns*, *ut supra*, p. 42.

¹⁵ *Ibid.*, p. 42.

¹¹ *Ibid.*, p. 43.

¹³ Head, *ut sup.*, vol. ii., p. 37.

¹⁶ Head, *ut sup.*, vol. i., p. 320.

* Laing, *Notes of a Traveller* (1842), p. 423.

Foreign libraries. the relations which have subsisted between the Court of France and the Papal See.¹ Thus, if these statements be trustworthy, the nine chief libraries of Rome contain more than 41,000 volumes of MSS., and 700,000 of printed books.

Ambrosian Library at Milan. The Ambrosian Library at Milan owes its existence to the munificence of Cardinal Federigo Borromeo, nephew of Charles Borromeo, and his successor in the see of Milan, (1609). This prelate began to collect books, when a student at Rome; and enlarging his plan as he advanced in age and dignities, he, when raised to the archbishopric of Milan erected an edifice, placed in it his collection, and opened it to the public under the title of *Bibliotheca Ambrosiana*. Some of its choicest treasures carry back the visitor's imagination to the remote antiquity of the seventh century, when the monastery of Bobbio was founded by Scottish and Irish monks in the heart of the Apennines. When, in 1690, Montfaucon visited the *Ambrosiana*, it had accumulated 40,000 volumes, conveyed, he says, "from Thessaly, Chio, Corfu, the country of Otranto, and Calabria."² . . . Two or three years later our own Addison paid a similar visit, and his first reflection is,—“to show the Italian genius, they have spent more money on pictures than on books. . . . *Books are, indeed, the least part of the furniture that one ordinarily goes to see in an Italian library.*”³ So variously does the same object impress different beholders, and so true is it that the eye sees what it brings.

This library contained, in 1836, according to the statement of its librarian, Signor Amati, nearly 100,000 volumes of printed books, and 4633 volumes of MSS., comprising about 18,000 separate works or articles.⁴ No numerical return for the *Ambrosiana* appears in the Foreign Office Correspondence of 1850–52. It is, however, very probable that a similar (and unintentional) mistake was made in reckoning the number of volumes of printed works in this library, as that which is known to have been made in its neighbour, the *Brera*,⁵ and that the former does not really possess, even in 1857, much more than 80,000 printed volumes, and 5500 MSS.; and there is annexed to it a gallery of pictures, statues, antiques, and medals, comprising many articles of great rarity and value. In the department of MSS. is a solitary but enormous volume of the physico-mathematical works of Leonardo da Vinci, with his designs representing machines, with figures and notes, collected by Pompeo Leoni; it was presented by a citizen named Galeazzo Arconati, who generously refused a vast sum for the precious treasure, and, to secure the possession of it to his country, consigned it to the Ambrosian Library as to an inviolable sanctuary. The sanctuary, however, was violated by the French in 1791, who seized the cherished relic of Leonardo's genius, and sent it to Paris;⁶ but what an abuse of victory enabled them to carry off, the fortune of war at length compelled them to restore. The same department also includes the famous Virgil, with annotations by Petrarch, in his own handwriting, with his impassioned note, in eight lines, regarding Laura; ten letters of Lucretia Borgia, addressed to Cardinal Bembo; the Missal of Cardinal Borromeo, richly illuminated; and, amongst various early Greek manuscripts, a

Josephus, translated by Rufinus, on papyrus, written on both sides of each leaf. Manuscript books upon this material are of the greatest rarity, and this volume, according to Montfaucon, was 1200 years old, or of the fifth century. The MSS. in this library were chiefly collected from the suppressed monasteries; and, in particular, those which came from Bobbio are of peculiar value. Most of the Ambrosian palimpsests belonged to this collection, including fragments of Cicero's *Orations*, and the Letters of Marcus Aurelius and of Fronto. There is also a Psalter of the seventh century, with the *Commentary* of St Jerome, filled with Gaelic glosses in the ancient Irish character.⁷ Cardinal Angelo Mai, afterwards librarian of the Vatican, formerly held the same office in the Ambrosian Library at Milan, and there commenced those researches which have entitled this distinguished scholar to the lasting gratitude of the learned. The Brera Library at Milan was counted in 1845, and found to contain 104,298 volumes. In 1847 it contained 108,971 volumes;⁸ and in the preceding eleven years the average annual rate of increase was 2180 volumes; so that its present numbers will probably be about 125,000 volumes of printed books, and nearly 1000 volumes of MSS. The other libraries of chief note in the Lombardo-Venetian territory are those belonging to the Universities of Pavia and Padua. These libraries contained, at the end of 1846: the first, 70,564, the other 79,226 volumes; and are open ten months in the year, four hours in winter and six in summer, every day excepting Wednesdays, Sundays, and holidays.⁹

Bologna, celebrated for its scientific and literary institutions, and its academy for the encouragement and promotion of art, boasts likewise a great public library. This extensive collection is especially rich in the literature of the natural sciences; and in Oriental MSS. Of Arabic alone there are 550, including a superb Dioscorides, and a curious atlas. It consists of above 105,000 printed volumes, and about 6000 MSS.;¹⁰ is contained in the Manfredi Palace; and is open to the public six days in the week, during nearly eleven months in the year (*giorni festivi*, of course, excepted). Among the MSS. the most precious is a Lactantius, in square quarto, of the sixth century, written in uncial letters; the Four Gospels, in Armenian, with charming miniatures, of the twelfth century; a Greek MS. of modern date,—a sort of medical commonplace book,—which is believed to contain some unedited fragments of ancient authors;¹¹ and 200 volumes of manuscript collections of the celebrated naturalist Aldrovandus. Mezzofanti was long librarian here; and a visitor who profited by his polite readiness to exhibit the rarities of the collection, has noted that on one occasion he produced a Mexican MS. which had puzzled all the pundits of Bologna, even himself included. The other universities of the Roman states are also possessed of considerable collections of books. That of Perugia, founded as early as 1320, has a library of 30,000 volumes;¹² that of Ferrara, founded at a much later period (1646), has a library containing no less than 80,000 printed volumes, and 900 MSS.;¹³ and the three universities of Macerata, Urbino, and Camerino, have each libraries, though upon a smaller scale. The first named

¹ *Archives*, ut supra, p. 374.

² Addison, *Remarks on several parts of Europe*, p. 32.

³ Panizzi, *Information on Foreign Public Libraries of Printed Books*, printed in Appendix to Report of Select Committee on British Museum, 1836, pp. 544, 545.

⁴ *Ibid.*, in *Minutes of Evidence before Select Committee on Public Libraries*, 1850, p. 53, Q. 724.

⁵ Eustace, *Classical Tour*, vol. iv., p. 27, et seqq.

⁷ No special account of this collection, that we are aware of, has appeared in recent times. Oppicelli's *Monumenta Biblioth. Ambros.* was printed at Milan in 1618, 8vo; and Boscha *de Orig. et Statu Bibl. Ambros.* was published in the ninth vol. of Grævinus's *Thesaurus Historiarum Italiae*. Vander Putten's *Oratio de usu fructuque librorum Biblioth. Ambros.* appeared at Leyden in 1623, 8vo.

⁸ *Foreign Office Returns*, 1850, ut supra, p. 111.

¹⁰ *Ibid.*, 1852, p. 24.

¹² Valery, *Voyages Historiques, Littéraires, et Artistiques en Italie*, book xviii., c. 6.

⁹ Montfaucon, *Diarium Italicum*, c. ii.

¹¹ *Ibid.*, pp. 38, 39.

¹³ *Archives*, ut supra, p. 394.

¹⁴ *Ibid.*, book vii., c. 12.

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libraries.

library, otherwise *Mozziana*, contains 12,000 printed volumes, and 68 MSS. The second, interesting, as containing some poor relics of the once noble library of the Urbino *Dukes*, is beginning to be cared for, say recent travellers, with somewhat more of energy than hitherto. The last of them appears to be the smallest and least valuable of all the papal libraries. The most interesting books in the Library of Ferrara, are the autograph manuscripts of the *Orlando Furioso*, in some places so interlined with changes and alterations by the author, as to be scarcely legible; and of the *Gerusalemme Liberata*.¹ It also boasts of a remarkable series of the early editions of Ariosto, now of the greatest rarity. The Town Library of Ravenna contained, according to Valery, at the date of his last visit, more than 40,000 printed volumes, and 700 MSS. Amongst the former are comprised about 700 editions (according to the same authority), of the fifteenth century, some of them of the greatest curiosity.² The once celebrated papyri of Ravenna have nearly all disappeared.

Florentine
libraries.

The public libraries at Florence are the *Mediceo-Laurenziana*, or Laurentian; the collection bequeathed to the public by Magliabechi, by whose name it is distinguished; the *Marucelliana*; the *Riccardiana*, which was purchased, in 1815, of the Riccardi family; and the Library of the *Belle Arti*, containing the books which were taken out of the suppressed convents.

Mediceo-Laurentian
library.

The Mediceo-Laurentian Library, which is contained in the convent annexed to the church of San Lorenzo, was commenced by Cosmo de' Medici, the father of a line of princes whose name and age, as Roscoe has said, are almost synonymous with the restoration of learning. "His credit," says Gibbon, "was ennobled into fame; his riches were dedicated to the service of mankind: he corresponded at once with Cairo and London; and a cargo of Indian spices and Greek books were often imported by the same vessel."³ As the natural disposition of this princely merchant led him to take a very active part in collecting the remains of classical antiquity, so his wealth and extensive commercial intercourse enabled him to gratify his taste to the fullest extent. He enjoined his friends and correspondents, as well as the missionaries who travelled into remote countries, to search for and procure ancient manuscripts in every language and upon every subject. He availed himself of the services of the most learned men, his contemporaries; and the situation of the Eastern empire, then falling into ruins, afforded him an opportunity of obtaining many valuable works in Hebrew, Greek, Chaldaic, Arabic, and other languages.⁴ After the death of Cosmo, his son pursued the same object with steady perseverance, and added considerably to the treasures which had been accumulated by his father. But although the ancestors of Lorenzo de' Medici had laid the foundation of the Laurentian Library, the honour of raising the superstructure belongs to Lorenzo himself, whose assiduity and liberality in enlarging his collection of books, manuscripts, and antiquities, were unbounded. To this object his time and his fortune, exceeding that of princes, were equally devoted. Shortly after the death of Lorenzo, however, this matchless collection was dispersed by the Florentines themselves.

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libraries.

In the disturbances which attended the expulsion of Pietro, and the approach of the French under Charles VIII. (1494), miserable plunderers openly carried off, or secretly purloined, whatever they could lay their hands on that was rare, curious, or valuable. Part of the library, however, was preserved by the interposition of the magistrates, but only to encounter new perils. The Florentine treasury becoming exhausted, the rulers of the day (amongst other expedients) sold the books to the Dominicans of St Mark. At this point the history of the *Laurenziana* becomes linked with the fortunes of the still older library of that monastic community, a collection of which Cosmo may be said to have been the founder, conjointly with Niccolo Niccoli. The 800 volumes (or at least the survivors of them) which Niccoli had bequeathed to his fellow-citizens, and which Cosmo had redeemed from a lien that had well nigh annulled the legacy, and had committed to the custody of the Dominicans, were now united with what remained of the domestic library of Cosmo himself, and of the more splendid acquisitions of Lorenzo. But, within two years, the misdirected zeal of the impulsive Savonarola,—for a while virtual King of Florence,—scattered with lavish hand some of the choicest books as presents, and dragged others with contumely to a vast bonfire in the public square!⁵ In this wild *auto-da-fé*, Boccaccios, Petrarchs, and Pulcis, in all the pomp of their rich illuminations and sumptuous bindings, mingled their ashes; with this result, amongst others,—that the frenzied hatred of Dominican monks in the fifteenth century connects itself with the scarcely less frenzied love of English peers in the nineteenth, as cause with effect. Had no Savonarola burnt *Decamerons* in the Florence piazza in 1497, assuredly no Duke of Marlborough would have given L.2260 for a *Decameron* in 1812. After Savonarola's death, the Dominicans, falling into embarrassment in their turn, sold their library (1508) to Pope Leo X., who caused it to be removed to Rome. It was re-conveyed to Florence by his successor Clement VII., who, by a bull dated the 15th of December 1532, made provision for its future security.⁶ In 1571 the Grand Duke Cosmo I. made the library public. This library, the noblest monument which the Medicis have left of the glory of their line, contains 6952 MSS., of which a very large proportion—despite so many losses, and such strange vicissitudes—combine rarity and value. They have been described in a catalogue of thirteen folio volumes, compiled by the learned Bandini,⁷ formerly librarian, at the suggestion of the Emperor Francis I., who presented him with a sum of money towards the expenses, and made him promises of further assistance, which, however, were rendered unavailing by the death of that sovereign.⁸

The most celebrated manuscripts in the Laurentian Library are,—the Virgil of the fourth or fifth century, the long missing leaves of which Mai had the good fortune to discover in the Vatican; the famous *Pandects* of the seventh century, in two volumes, brought to Florence in 1406; a Tacitus, translated in the ninth century from one dated in the year 395; the *Decameron*, supposed to have been written in 1384 by Amaretto Mannelli; the *Epistolæ Familiares* of Cicero, copied by Petrarch; a Tasso, with copious notes, in the hand of Politian; and many Dante MSS.

¹ There are also a few Arabic MSS. *Archives, ut supra*, (1850), p. 395.

² Valery, *Voyages Historiques, Littéraires, et Artistiques, en Italie*, book xii., c. 3.

³ *Decline and Fall of the Roman Empire*, vol. xii., p. 136.

⁴ Bandini, *Lettera sopra i principi e progressi della Biblioteca Laurenziana* (Fir. 1773), cited by Roscoe, *Lorenzo de' Medici*, vol. ii., p. 387.

⁵ Perrens, *Jerome Savonarola* (1853).

⁶ Roscoe, *Life of Lorenzo de' Medici*, vol. i., pp. 37, 38; and vol. ii., pp. 60, 254, 284, et seqq.

⁷ *Catalogus Codicum Manuscriptorum... Bibliothecæ Laurentianæ*. Florentiæ, 1764—78, fol.

⁸ Roscoe, *Life of Leo X.*, vol. iv., p. 181, 8vo ed. See also *Bibliotheca Leopoldino-Laurentiana; sive Catalogus Manuscriptorum qui jussu Petri Leopoldi in Laurentianam translati sunt*, &c. Florentiæ, 1791—1793, fol.

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libraries.

of the highest interest, although but copies (Dante's autographs have perished)—amongst them the celebrated letter discovered by Mehus, and published first by Dionisi, and afterwards by Foscolo.

Of printed volumes, the Laurentian Library possesses but 1316; having always been pre-eminently, and, until a recent date, exclusively, a library of MSS. The famous collection of first editions of Greek and Latin classics, formed by Count Angelo d'Elci, has worthily created an exception to the rule. It amounts to 1207 volumes; and besides these there are 109 other volumes, which have at various times been presented by, and accepted from, their respective authors.

Maglia-
bechi
library.

Magliabechi, from being a servant to a dealer in vegetables, raised himself to the honourable office of librarian to the Grand Duke of Tuscany at Florence, and became one of the most eminent literary characters of his time. The force of natural talent overcame all the disadvantages of the humble condition in which he had been born, and placed him in a position to make his name known and respected. But he endeavoured to deserve still better of his countrymen, by presenting them, some time before his death in 1714, with his large and valuable collection of books, together with what remained of his fortune, as a fund for its support. This constituted the foundation of the Magliabechian Library, which, by the subsequent donations of several benefactors, and the bounty of some of the grand dukes, was so much increased both in number and value, that it may now vie with some of the most considerable collections in Europe. The books printed in the fifteenth century have been described by the librarians, Fossi and Follini, who dedicated the catalogue¹ to Ferdinand III. Another and larger catalogue was completed in 1856, by the late learned and laborious bibliographer, Giuseppe Molini (who died in December of that year), to whom the *Magliabechiana* is also indebted for an improved rearrangement; but there is no printed catalogue of the library. It is particularly rich in the early productions of the Italian press, which are described by Follini alphabetically, with much accuracy of detail; and to these descriptions are added brief notices of the lives of the different authors. The Magliabechian Library is under the same roof with the Uffizi Gallery. It contains about 140,000 volumes of printed books,² and 10,000 manuscripts. Among its richest treasures are,—the Mentz Bible of 1462, on vellum; the first edition of Homer, printed at Florence, 1488, also on vellum, with miniatures, and presented to Pietro de' Medici; a copy, on vellum, of the Dante of 1481, embellished with miniatures within and nielle without, presented by Landino to the senate of Florence; a magnificent copy of the *Anthologia* of Lascaris, 1494, also a present to Pietro de' Medici; with other vellum copies of singular beauty of the Florentine history of Leonardo Aretino (Acciaiolì's translation, Ven. 1476); and of the *Argonautica* of Apollonius (Flor. 1496).³ These are volumes which would give importance to any library.

Marucel-
lian Li-
brary.

The Marucellian contains 33,435 volumes of printed books, and 1375 volumes of MSS.; the Riccardi collection

about 20,000 volumes of printed books, and 3600 MSS., many of them of the highest value. The collection of the *Belle Arti* contained, when the official returns of 1835 were made, 11,000 volumes.⁴ There is no mention of it in those of 1850. The disbursements on account of these various libraries are made by their respective librarians, under the control of the Minister of the Interior; the sums ordinarily expended, however, are but trifling.

The *Biblioteca Palatina*, or private library of the Grand Duke in the Pitti Palace, dates but from 1815; the old library of the Pitti having been distributed by Duke Leopold amongst the various public collections of the city; the Poggiati collection, and a part of that of Count Reviczky having been its groundwork. Literary researches meet with no obstruction, but as it is not public property, there is no account of its extent in the recent official returns. Valery states that, when he visited it, the number of printed volumes exceeded 80,000, and that of MSS. was nearly 1500. It is, unquestionably, a splendid collection, and in all probability keeps better pace with the progress of publication abroad than does any other library in Florence. Its strength, too, in Italian literature is proverbial. Amongst the *Cimelia* of the Palatine Library are the MSS. of Machiavelli, rich in correspondence and in state papers (although a portion of them has found its way to the British Museum); and those of Galileo, including a noble series of letters (now in course of publication), and of works published by his assistants, and annotated by himself. This collection—which includes the papers of Torricelli, of Viviani, and of other eminent philosophers—amounts to more than 300 volumes.⁵ The libraries of the University of Pisa and of the city of Sienna are valuable, the former possessing about 62,500 volumes,⁶ and the latter about 35,000 volumes of printed books, and 3417 MSS.,⁷ to which an annual addition of books to the value of 100 scudi is respectively made. In almost all the provincial towns of Tuscany, there are also to be found public libraries, more or less extensive, which are all placed under the control of the communal magistrates.⁸

There are four public libraries (or libraries so-called), at Naples, viz., the Royal Library, the Brancacciana Library, the Library of the University, and the Library of the Oratorian Priests of St Philip Neri. The Royal Library (*Biblioteca Borbonica*) contains about 200,000 printed volumes and 4000 MSS.; the University possesses 25,000 volumes; the convent of St Philip Neri has but 18,000 printed volumes, and 60 MSS.; the Brancacciana contains 70,000 volumes of printed books, and about 1000 volumes of MSS., relating chiefly to Neapolitan history.⁹ This library was founded by the bequest of Carlo Brancaccio in 1688. The public have free admission to read in these libraries, but no books are allowed to be taken away. They are all professedly open every day, for periods varying from six hours to two hours daily, excepting on holidays, when they are closed. But how easily liberality on paper may be turned into its opposite in practice will be seen by the testimony of an English visitor towards the close of 1856:—"Nominally open from twelve to two o'clock," he says,

¹ *Catalogus Cod. Sec. xv. impressorum Bibliothecæ Magliabechianæ*, Flor. 1793-95, fol.

² "I volumi stampati si possono giudicare circa 140,000, compresi i duplicati che per ordine superiore sono stati già verificati e separati (*Official Returns to Foreign Office*, 1850, p. 368)." According to Molini, these duplicates amount to 11,000; and many of them occur again and again in other Florentine libraries. This superfluity of books in one direction, combined as it is with paucity of books—foreign ones especially—in another, constitutes one of his arguments for combining the six libraries of the city into three main collections: (1.) *Medical*; (2.) *Legal*; (3.) *General*,—containing all the MSS., and all the printed books relating neither to medicine nor to law. With the bulk of the duplicates he proposes to enrich the provincial collections. (*Progetto di Riordinamento per le Pubbliche Librerie di Firenze*, Fir., 1848, 8vo, p. 3.) The plan has suggestive worth in it, beyond the limits of Tuscany. Some very partial effect has been already given to it, we believe, but the Tuscan returns of 1850 contain no allusion to the subject. The main libraries of Florence continue as yet to be distinct collections.

³ Appendix to *Report from Select Committee on British Museum*, 1835, p. 489.

⁴ Valery, *Voyages*, &c., ut supra, liv. x., ch. 18.

⁵ Appendix to the *Report of the British Museum*, ubi supra.

⁶ *Foreign Office Returns* of 1850, p. 372.

⁷ *Ibid.*, p. 374.

⁸ *Foreign Office Returns* of 1851, pp. 31-33.

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libraries.

"the Borbonica is twice a-week closed at one, under pretence of cleansing, . . . and on fête days innumerable. . . . Having entered, the difficulty is to find the books, for there is scarcely any arrangement,—and why should there be when so many are prohibited? . . . Not only are Filangieri, Bentham, the *Bibliothèque Universelle de Genève*, for instance, refused, but the *Kosmos*. At all events, an express permission must be obtained from Rome to read it."¹ Valery has mentioned a peculiarity in the arrangements here which is probably unique: "One room is set apart for the blind, who pay persons to read to them. . . . The picturesque image of Dante must be often realized there, 'Lo mento a guisa d'orbo in su levava.'"² The expenses of the Royal Library are included in the same grant with those of the Brancacciana. It is entitled to two copies of all books printed in the kingdom of Naples; and 4000 ducats (L.687) are annually appropriated to the purchase and binding of books.³ The expenses of the Library of St Philip Neri, or of the "Girolomini," are defrayed out of the funds of the convent to which it belongs. The Brancacciana and University Libraries are, each of them, entitled to one copy of every book printed in the city of Naples. This collection is rich in ancient books. Its special show volume is a finely illuminated copy of the *Tragedies* of Seneca. The Royal Library was originally formed of the old Farnesian Library, brought from Rome to Naples by Charles III.; and of those of the Jesuits, and various suppressed convents. The collection of early printed books is considerable, and has been described in a catalogue by the Chevalier De Licteris, Naples, 1828–41, 4 vols. folio.⁴ Here is a copy of the *Catholicicon* of 1460, and the Bible of 1472, both upon vellum; the Petrarch of 1470; the Dante of Mantua; the first edition of the celebrated mediæval legist, Bartholus, of Sasso Ferrato, 1471, the first book printed at Naples, and other specimens of the early Neapolitan press. But the most choice book is one of the three or four copies, printed on vellum, of the first edition of Homer, 1488. The volume of the *Iliad* is, unfortunately, defective. Several leaves, on account, no doubt, of their illuminations, having been ruthlessly torn out of the volume.

The *Odyssey* has fortunately escaped, the first page being illuminated in the best style of Italian art, with the arms of the proprietor; and there is also inserted one of the most charming portraits in existence, the full size of the book, of one of the Farnese family, if not by the hand of Raffaele, at least by his master, Pietro Perugino. Among the MSS., besides the celebrated *Hours* of Giulio Clovio, there are many of great beauty and interest; virtually, however, they are sealed books. Even eminent scholars, bearing the commission of the French Ministry of Public Instruction, have wasted a fortnight in waiting for facilities which were, after all, refused. "The palace of the Studj bears for its device, *Jacent nisi pateant*; and for years all the MSS., and part of the *Museum*, were locked up." Such is the testimony of M.M. D'Aremberg and Renan, in their report to the minister of 25th July 1850.⁵ There are no public libraries in any of the provincial towns of the mainland, excepting Brindisi,⁶ which has a small collection bequeathed by Monsignor de Leo; but in every diocese there is a library belonging to the See, to which, upon application, admission may at all times, it is said, be readily obtained.⁷ In Sicily—compared with which Naples has always been a

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Libraries.

laggard—the provision of public libraries is somewhat more ample, and their management more enlightened. The Palermo collection, called indifferently the University,⁸ or the "Communal" Library, contains nearly 80,000 volumes of printed books. The Jesuits of Palermo have another library, reported to contain about 40,000 volumes. The Library of Messina is stated to contain about 20,000, and that of Catania, nearly 40,000 volumes of printed books. Collectively, these four libraries contain upwards of 1200 MSS. There are also libraries of less importance at Girgenti, Syracuse, Termini, Nicosia, Caltagirone, and Trapani.⁹ The monastery of Monte Cassino retains its library (of about 18,000 volumes, according to Valery), but with diminished lustre. The collection, however, still includes some fine specimens of early typography. Amongst the MSS., amounting to about 800 volumes, the most ancient is a Latin version of Origen's *Commentary on the Epistle to the Romans*, dated in the year 569; a Virgil of the fourteenth century, copied from one of the tenth, in the Lombard character; a Dante of the thirteenth century; the Offices of the Virgin, with charming miniatures, executed in 1469 by Bartolomeo Fabio di Sandalio; and an extensive series of original letters of Mabillon, Montfaucon, Muratori, and other learned men of the last century, from which M. Valery has published an interesting selection.¹⁰ In the archives of the monastery there is preserved a very remarkable series of more than 40,000 deeds and records of various kinds,¹¹ including many original charters, papal bulls, and other like documents, from the eighth century. It is rich in materials for the history of Apulia, Calabria, and Naples. The archives occupy three apartments; and, if it be borne in mind where they have been preserved, and what they have survived, may well be termed a wonderful collection.

The Italian libraries which yet remain to be mentioned are numerous, and some of them considerable, particularly those of Venice and Turin. The Library of St Mark at Venice forms the west side of the Piazzeta, or Palazzo Reale. This library was commenced in the fourteenth century, the original collection having been begun by Petrarch, who gave some books to the Republic in 1362. About a century later, Cardinal Bessarion presented to the Republic the curious collection of MSS. which he had formed in Constantinople, in Egypt, and in Greece; and further additions were subsequently made to it by other cardinals. But, strange as it may seem, especially when we read in Bessarion's letter to the Doge, which accompanied the gift (30th April, 1468), the words "*venerable* Library of St Mark," there is not a scintilla of evidence to show either (1.) that the writer had in his memory the gift which Petrarch had so ardently wished should prove the groundwork of a Venetian library; or, (2.) that the new donation put it into any one's mind to ascertain the fate of the old one. Bessarion's collection became the true foundation of the present *Marciana*; and it appears that the books of Petrarch remained entombed until 1635, when researches into his biography gave Tommasino a clue which ultimately set the then procurators of St Mark to ransack a neglected and dust-choked little room, in near proximity to the famous bronze horses. Here the MSS. were found, some petrified into fossils, and others ready to crumble in the hands of the discoverers. The Library of

¹ Letter from Naples, published in the London *Athenæum*, 1857, p. 117.

² Valery, *ut supra*, liv. xiii., c. 6.

³ *Foreign Office Returns*, 1851, p. 33.

⁴ *Codicum Sæculi xv. impressorum qui in Regia Bibliotheca Borbonica adservantur Catalogus*. The first volume of a general catalogue of the printed books appeared in 1832, but has had no successor.

⁵ *Archives des Missions Scientifiques*, vol. i., p. 383.

⁶ *Foreign Office Returns*, 1851, p. 30.

⁷ App. to Report, pp. 490, 491.

⁸ *Foreign Office Returns* of 1852, pp. 25, 26.

⁹ *Ibid.*

¹⁰ *Correspondance inédite de Mabillon et de Montfaucon avec l'Italie*, 3 tom., Paris, 1847.

¹¹ Curzon, *Notices of Italian Libraries* (Philobiblon *Miscellanées*, *ut supra*).

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St Mark is now deposited in two apartments, one of which is appropriated to MSS., whilst the other contains the printed books. The number of volumes of printed books was officially stated at 65,000 in 1822;¹ at 85,602 in 1835;² and at 103,859 in 1848.³ That of MSS. at about 5000, in 1822; and, by Mr Curzon, as amounting in 1840 to nearly 10,000, more than 1000 of which are upon vellum.⁴ Amongst these MSS., it need scarcely be said, but a very small number of the Petrarch donation is preserved. They include a Homer, translated by Leontio Pilato, and copied in the handwriting of Boccaccio; several important Greek MSS.; an Evangelarium, according to Morelli, 1000 years old; the *Laws of Lombardy*, the most valuable copy known; and the original manuscript of Father Paolo Sarpi's *History of the Council of Trent*, corrected with his own hand. Of printed books, several of great value, on vellum, were carried by the Austrians to Vienna; but there still remain some choice specimens of the Aldine press; and a copy on vellum of the first edition of Homer, unrivalled for beauty of condition. It was among the spoils restored by the French in 1815, and Van Praet has expressed his deep regret at seeing the Royal Library at Paris deprived of this and other similar works.⁵ Though small when compared with many other libraries of the Continent, this collection includes an unusual proportion of rare and valuable books.⁶ In the Armenian convent, in the island of San Lazaro, close to Venice, there is a small but interesting collection of books and of Oriental MSS. One of these, the Gospels of Matthew and Mark, is a square quarto of the eighth century; another is a complete Armenian Bible of the twelfth century. The library attached to the University of Turin contained, in 1846, according to the University historian, 110,000 volumes;⁷ and, in September 1849, according to an official return, nearly 121,000 volumes of printed books, and a rich collection of MSS., amounting to nearly 3000.⁸ It is open to the public in general every day except festivals, during ten months of the year. Attached to the University of Genoa, is a library, consisting, in 1849, of about 39,200 printed volumes, and 800 MSS. Genoa has three other public libraries, containing in the aggregate about 60,000 volumes.⁹ The University Library of Padua contained, in 1847, upwards of 78,000 volumes of printed books, and 1672 MSS.¹⁰ Some other libraries in that city contain MSS. of interest, as do also the Chapter Libraries of Verona, Novara, and Vercelli. From a rescribed manuscript discovered by Niebuhr, the Roman historian, in the collection of the Chapter of Verona, was deciphered and published no inconsiderable portion of the *Institutions* of Gaius, which served as a model to Justinian, or rather to

Tribonian, in framing that elementary exposition of principles which is prefixed to the *Digest*. The writing is in uncial letters, perhaps of the fourth century, and the superscribed MS. itself—containing the *Homilies* of Jerome—can scarcely be older than the seventh. The same collection contains a palimpsest Virgil of the third or fourth century, overwritten with the Gregorian *Comment on Job*, in a Longobardic hand of the eighth. Mr Curzon looks on this as anterior to the Medicean Virgil.¹¹ The Library at Mantua contains upwards of 40,000 volumes of printed books, and about 400 MSS.¹² Some of its books are curious, and it is very freely accessible.

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IV. GERMANY

The libraries of Germany, taking that name in its widest Libraries acceptance, are, some of them, of the first order, and many of them extensive and important; but we confine our many notices exclusively to the principal collections, which we shall describe mainly in the order, not of place or of time, but of their relative magnitude and value.

The Imperial Library at Vienna was long esteemed inferior only to that of the Vatican and to the Royal Library at Paris for the rarity and value of its contents. It was founded, as early as the year 1440, by the Emperor Frederick III., who spared no expense to enrich it with printed books, as well as manuscripts in every language. By the munificence of succeeding emperors, numerous important and valuable accessions were made to the library, amongst which may be mentioned the famous collection of John Joseph Fugger; the collections of Tycho Brahe, of Busbequius, of Cuspinian, and of Hohendorff; the large and interesting Library of Prince Eugene, and a considerable portion of the Library of Corvinus. In 1575 it was declared publicly accessible for the promotion of learning. The Imperial Library occupies eight spacious apartments, and a ninth is appropriated to a very valuable collection of medals and other curiosities.¹³ The Grand Library is a large central room, the floor of red and white marble, diamond-wise. The vaulted oval dome, 193 feet in height by 57 wide, supported by columns of scagliola, with its painted ceilings, and marble statues, exceeds in splendour any similar room in Europe. In Dibdin's *Bibliographical Tour* there is an admirable representation of it. The books in this great room, being for the most part from the fine library of Prince Eugene, are in rich old morocco bindings, with arms on the sides. The entire collection, according to the latest authority, now consists of more than 365,000 volumes of printed books, and about 20,000 volumes of MSS.¹⁴ The books are disposed according to their sizes, and include

¹ Bettio, librarian of St Mark's, as quoted in Balbi's *Essai Statistique des Bibliothèques de Vienne*, p. 48.

² Panizzi, *ubi supra*.

³ *Foreign Office Returns*, 1850, p. 110.

⁴ Curzon, *ubi supra*.

⁵ The privation, however, was far from being complete. A bystander who (in 1815) made some notes of what passed under his eyes, had opportunities of witnessing the active "requisitions" of the commissaries of the allied powers, for those literary trophies which had long been as keenly regretted by the losers, as they were proudly treasured up by the captors. The Prussians pre-eminently distinguished themselves for the fierce assiduity of their quest. But marvellous was the ingenuity which occasionally perplexed the poor commissioners who, catalogue in hand, had to scrutinize, first the books produced, and then the lists of those that had been carried off. Many travellers who visited the Royal Library, under favourable auspices, while the memory of these things was yet fresh, will recall the subdued but irrepressible glee with which choice books were sometimes shown,—books that had formerly been shown by other librarians to other visitors.

⁶ Balbi, in the appendix to his *Essai Statistique*, gives some very extraordinary particulars of the *Archivio Generale* at Venice, to which great attention is paid by the Austrian government. This unparalleled collection contains, he says, 8,664,709 stitched quires, divided into 1890 departments, and arranged in 298 apartments. But whether its value corresponds with its magnitude, is a point on which we are very much left to our own conjectures; nor would it be easy to determine to what extent Vienna may have been enriched at the expense of Venice. See *postea*, p. 419.

⁷ Vallauri, *Storia della Università degli Studj del Piemonte*, tom. iii., p. 138.

⁸ *Foreign Office Returns* of 1850, p. 341.

⁹ *Notices of Italian Libraries*, *ut supra*, p. 43.

¹⁰ *Ibid.*

¹¹ *Ibid.*, p. 111.

¹² *Foreign Office Returns*, *ut supra*, p. 311.

¹³ "Ce cabinet est encore plus remarquable par la collection de toutes les monnoies, qui est unique dans le monde, quoiqu'elle ne soit pas absolument complète." (*Voyage de deux Français*, tom. iv., p. 144, Paris, 1796.) But some fine collections have been formed since this admiration was recorded.

¹⁴ Comp. Petzhöldt, *Handbuch Deutscher Bibliotheken* (1853), p. 384, and the *Foreign Office Returns* of 1850, p. 109, with their statements as to annual increase.

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almost a complete series of *Incunabula*, exhibiting the origin and progress of the typographic art. The number of works printed in the fifteenth century is estimated at 15,000, of which perhaps 3000 are duplicates. Amongst these, the first place for rarity and value belongs to those printed upon vellum, including the *Psalter* of 1457; the *Rationale* of Durandus, 1459; the *Constitutiones* of Pope Clement V., 1460; the Latin Bible of 1462; *S. Hieronymi Epistolæ*, 1468; Cæsar, Apuleius, and Aulus Gellius, each of them in 1469; the Pliny of the same year, and also that of 1472, and many others, all in the finest condition. The Apuleius and the Aulus Gellius were once the property of Cardinal Bessarion, and are comparatively but recent acquisitions of the imperial collection. The Florence Dante of 1481, with the commentary of Landino, and the plates of Baldini, from designs by Botticelli, is likewise in this library. This is the finest copy extant, excepting that in Lord Spencer's collection, and each of them possesses twenty copperplates.¹ The Cimelia, or most remarkable rarities, are twenty-four in number. Amongst them are a tablet of bronze, containing the original *Senatus-consultum*, or decree of the Roman senate for the suppression of the Bacchanalians, passed in the year 186 B.C.;² the imperfect *Tabula Peutingeriana*, a travelling map of the ancient world, compiled in the eighth century, on parchment;³ and several palimpsests procured from the monastery of Bobbio. About 3000 of the MSS. are on vellum. Some deserve to be mentioned, on account of their singular rarity; as, for example, (1.) A Mexican manuscript,—a specimen of that curious coloured figure-writing which Lord Kingsborough's great work has made familiar to students. It is, as travellers are usually told, on human skin, or, much more probably, on deer-skin; (2.) The unique manuscript of the Fifth Decade of Livy, assigned to the sixth century, and reported to have been brought from Scotland by St Suelbertus, the apostle of the Frisians; (3.) A *Psalter* (*Codex Aureus*), being written in letters of gold, which belonged to Charlemagne; (4.) A manuscript of St Mark's and St Luke's Gospels, written in gold and silver characters; (5.) A manuscript of Dioscorides, with coloured drawings of plants, the characters marked with minute accuracy, written in the year 505, by order of the Princess Julia Anicia, only daughter of the Emperor Olybrius. This precious manuscript was brought from Constantinople in 1550 by the

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celebrated Busbequius,⁴ ambassador from Charles V. to the Porte, by whom about 300 other Greek manuscripts were collected in the Turkish capital, including a manuscript of Pliny's *Historia Naturalis*, of contemporary date; and, (6.) An autograph manuscript of the *Gerusalemme Liberata* of Tasso. Besides these, there are in this collection fragments of Genesis, in uncial Greek of the fourth century, the letters of gold and silver, on purple vellum, richly ornamented with miniature paintings; a fragment on papyrus, containing the decrees of the third council of Constantinople, held in the year 680; the *Codex clathratus*, or fragments of the most ancient German translation of the Gospel of St Matthew, written in the early part of the eighth century;⁵ a German Bible, in six volumes folio, richly illuminated, written for the Emperor Wenceslas, who died in 1419; a French manuscript of the fourteenth century, written in large letters, according to the ancient orthography, profusely illuminated, and containing the history of Tristan, the celebrated Knight of the Round Table; together with many other rare, curious, and interesting works. The Greek MSS. in the Imperial Library have been described by Lambeck,⁶ Kollar,⁷ and Nessel,⁸ whose labours were confined to this class; and in the important and accurate work of Denis⁹ may be found an ample account of many of the Latin, with a few notices of Oriental MSS., the ages of the different MSS. being stated where these could be ascertained. Besides the cabinet of medals, there is also attached to the library a superb collection of engravings, reckoned to consist of 300,000, arranged and bound in 590 large folio volumes, 726 volumes of various sizes, and 322 portfolios. The collection of music contains 6000 works, theoretical and practical, in about 9000 volumes; and that of autographs amounts to nearly 10,000 pieces, classed under the heads of monarchs and princes, ministers and statesmen, poets, philosophers and men of learning or science, generals and renowned warriors, artists, and others.¹⁰ The sum allowed for the purchase of new books, independently of extraordinary grants, is about L.1100 annually.¹¹ The Imperial Library is open to the public every day, except on Sundays, holidays, and the vacations.¹² Here, however,—as in most of the greater Continental libraries—it is very reasonably expected that those who frequent it shall be students, not idlers, or seekers for mere amusement, and to

¹ Dibdin's *Bibliographical Tour*, vol. iii., pp. 291, 486, 518. See also his *Library Companion*, pp. 22, 581, 752.

² This is the same decree which is cited by Livy (lib. xxxix., c. 18); it was found in Calabria, on the estate of Prince Cigala. (*Voyage de deux Français*, tom. v., p. 136.)

³ For a long time this Itinerary was believed to be of the fourth century, and was identified with that Theodosian map alluded to in the well-known epigram of Sedulius,—*Hoc opus egregium, quo mundi summa tenetur*, &c.,—but the opinion is altogether untenable; although it is highly probable that its author (whomsoever he may have been) compiled it from ancient authorities, some of them perhaps older than the Itinerary of Antoninus. The Peutinger map has otherwise a curious history. Conrad Celtes discovered it at Spire, whilst searching for books and MSS. on behalf of the Emperor Maximilian I., to be placed in the Imperial Library. He seems to have looked on this remarkable document as out of the limits of his commission, and to have parted with it, either by gift or by sale, to Peutinger, who proposed to publish it, but died too soon. It then disappeared. Velsler, having vainly sought for it, published Peutinger's unfinished transcript. Seven years afterwards (1598), it was found in an old chest. Morelius then edited it, and it was subsequently republished by Berlius (1618), by Arnold (1682), and by Horn (1686). Then it disappeared again, and was not recovered until 1714. At length, after the lapse of 200 years, it found a secure place in that Imperial Library to which it should have gone at first; and thence, in 1753, it was superbly edited by Christ. von Scheyb. To complete these "Adventures of a MS.," it may be added, that a fragment of the missing portion of this most curious work has been recently discovered in the binding of a volume in the Public Library of Treves.

⁴ Of this manuscript Dioscorides, Busbequius himself has given a very interesting account. See Busbequii *Epistolæ*, lib. iv., p. 391.

⁵ These fragments were found in some old bindings of books.

⁶ *P. Lambeckii Commentariorum de Bibliotheca Cæsarea Vindobonensi libri viii.* (1665–79, fol.) The eight books occupy eight volumes. A fragment of the ninth volume is in Schelhorn's *Amanitates* (tom x., pp. 97–115). It would have taken seventeen more to have worked out the vast plan of the author. The rarity of the original edition is said to be owing to the avarice of Strellmayer, Lambeck's heir, who, under annoyance at the slowness of the sale, made a bargain with the War Department at Vienna, when paper was somewhat scarce, for the conversion of the remaining stock into cartridges. (Struvii, *Bibliotheca Historica Litteraria*, p. 594.) Kollar published a new edition in the years 1766–82.

⁷ *Breviarium et supplementum Commentariorum Lambeckii*, &c. (1690, fol.)

⁸ A. F. Kollarii *Ad Lambeckii Comm. de Bibl. Cæsarea Vindobonensi Supp.* (1690, fol.)

⁹ *Codices MSS. Theologici Bibl. Cæs. Vindobonensis* (1795–1800, fol.)

¹⁰ Petzholdt, *Handbuch Deutscher Bibliotheken* (1853), p. 384.

¹¹ *Foreign Office Returns*, ut supra, p. 96.

¹² *Foreign Office Returns* of 1850, p. 103.

Foreign Libraries this end dictionaries and school-books of all kinds, together with works of "light literature," are given out only on some literary purpose being assigned for their demand. For MSS. there is a special reading-room. Books are lent to the dignitaries and high functionaries of the empire, and to those scholars and literary men whose known position and responsibility ensure their safe return.

University and other Libraries at Vienna. In Vienna, the University Library ranks next to the Imperial Library. It contained in 1848, according to an official report, 120,609 volumes,¹ independently of the special collection attached to the observatory which occupied the same edifice. The present University Library dates but from 1777; the former collection—founded in 1435—having been long since incorporated with the Imperial Library. The University received the collections which had belonged to the convents suppressed by Joseph II.; and since 1806 it has had a right to a copy of every work printed in Lower Austria. Amongst what are called the private libraries, the most important is that of the Military Archives, established in 1801, upon a plan devised by the Archduke Charles. It contains 22,500 volumes,² chiefly on military science and geography; 20 large folio volumes of bulletins, gazettes, and journals, with an index; 73 atlases, with more than 3000 charts, maps, and plans of various kinds; and a small but curious collection of manuscript military memoirs, amongst which are those of Montecuculi, who commanded the imperialists opposed to Turenne, and of Prince Eugene. The Libraries of the Imperial Academy of Oriental Literature, of the Museum of Natural History, of the Philharmonic Society, and of the Imperial Archives, are also of great value. In the last are preserved some documents taken from the archives of Venice,³ and Marino Sanuto's original History of that republic, in 56 volumes, which was unknown when M. Daru published his celebrated work. The total number of libraries, public and private, in Vienna, is said to be fifty-three;⁴ and most, even of the latter, are accessible to students furnished with proper introductions.

Royal Library at Munich, &c The Royal Library at Munich, founded about 1660, by Albert V., Duke of Bavaria, is the most extensive collection in Germany, containing probably between 400,000 and 500,000⁵ volumes of printed books,—exclusive of a large number of duplicates, which were recently on sale,⁶—and 22,000 volumes of MSS.⁷ From a discourse on the origin and increase of the Library at Munich, delivered in 1784, by the Canon Steigenberger, then librarian (and translated into Latin by Vitali), it appears that the Hebrew, Arabic, Syriac, Greek, and Latin MSS. contained in this library even then formed a precious treasure; and, since that period, vast additions have been made to all de-

partments of the collection. The Royal Library, which formerly occupied a college which had belonged to the Jesuits, is now removed to a magnificent new building, in the style of a mediæval Italian palace. Among its MSS. we may specify a Greek New Testament, in uncial letters, of the eighth century; a copy of the Latin Gospels, of the same age; a New Testament, written in gold and silver letters, on purple vellum, of the ninth century; an Evangelarium and Missal, given by the Emperor Henry II. to the cathedral of Bamberg about the year 1020, most richly decorated with miniatures of the Byzantine school, the binding ornamented with carved ivory; a magnificent copy of the Seven Penitential Psalms, set to music for the chapel of the founder, by Orlando di Lasso, and richly illuminated. Its Oriental, and especially its Hebrew MSS., are both numerous and choice. The ancient MSS. relative to the art of music amount to a great number, and are exceedingly curious.⁸ A catalogue of the Greek MSS. in this library, compiled by Ignatius Hardt, was printed at Munich in 1804.⁹ Of printed books of the fifteenth century, the library is stated to possess (besides 50 block-books,¹⁰ some of them from the Haarlem press), 3500 without date, and 6000 with dates prior to the year 1500. Munich has also its University Library,—formerly at Ingolstadt, and removed to Munich in 1826,—which contained, in 1853, about 220,000 volumes of printed books, and 2000 MSS.¹¹

Royal Library at Dresden. The King of Saxony's Public Library at Dresden was founded in 1555, and now contains 305,000 volumes of printed books, besides 182,000 dissertations, and 2800 volumes of MSS.¹² The valuable library that formerly belonged to Count Bunau forms part of this noble collection, which is most complete in history generally, and in Greek and Latin classic authors. Amongst the printed books are some of the rarest specimens of early typography, including 600 of the Aldine editions, and many on vellum; besides a copy of the first edition of the *Orlando Furioso*, printed by Mazocco, "coll' assistenza dell' autore," in 1516, and other rarities. In the department of MSS. are,—another Mexican manuscript, said to be written on human skin, and containing, according to Thévenot, a calendar, with some fragments of the History of the Incas; *Liber de re militari*, on vellum, with superb paintings, in fine preservation, presented to an elector of Saxony by Matthias Corvinus; the original manuscript of the *Reveries* of Marshal Saxe, bearing at the end that he had composed this work in thirteen nights during a fever, and completed it in December 1733. Here also is a manuscript of Wycliffe's Testament, of the early part of the fifteenth century, let-

¹ *Foreign Office Returns* of 1850, p. 110.

² Petzholdt, *Handbuch*, ut supra, p. 371.

³ There seems to be ample warrant for this statement, notwithstanding the assertion, elsewhere repeated, that these Venetian archives have been "secured in perpetuity to the Municipality of Venice" (*Quarterly Review*, March 1855, vol. xcvi., p. 356). The very valuable article here referred to contains particulars of much interest respecting the present, or recent, state of these archives.

⁴ According to the enumeration of the learned and laborious author of the *Handbuch Deutscher Bibliotheken* (1853). Balbi, in his day, enumerated thirty-two Viennese libraries, without reckoning those of small importance. (*Essai Statistique sur les Bibliothèques de Vienne*, pp. 110, 111.)

⁵ The latest official return reads thus:—"800,000 volumes, including (*darunter*) 100,000 Dissertations and Pamphlets, 20,000 MSS. Yearly increase of books, 3000 volumes." Common as is extreme diversity of statement with respect to the extent of great libraries, there is no instance quite so extreme as this of Munich. The number of volumes has within a very few years been stated, in works of authority, sometimes as a little exceeding 400,000; sometimes as nearly 800,000. The main cause lies neither in the bad faith nor in the carelessness of writers, but in the childish vanity which prompts official persons, not merely in conversation, but when drawing up official reports, to shroud themselves in expressions of studied vagueness and obscurity, so that they may appear to be imparting information which, in truth, they are casting about to withhold. At least as much pains seems to be taken at Munich to mislead inquirers, as is commonly taken in Austrian libraries (for example), to give particulars which shall be minutely accurate. It has thus come to pass that the least trustworthy statements about the Royal Library of Munich are precisely the official statements. Yet, in most respects, the collection is so noble, that it need not shun comparisons strictly truthful and exact.

⁶ Murray's *Handbook for Southern Germany*, 7th edition (1855), p. 79.

⁷ Gessert, *Die Cimelien der Münchener Bibliothek* (*Serapeum*, vol. v., p. 86; abridged from the official catalogue).

⁸ Burney's *Present State of Music in Germany*, vol. i., p. 129.

⁹ It is entitled *Catalogus Codicum Manuscriptorum Bibliothecæ Regiæ Bavaricæ* (Monach. 1804–12, 5 vols. 4to).

¹⁰ Of these fine block-books, Dr Massmann has given an admirable account,—a model in its kind,—entitled *Die Xylographa der . . . Staatsbibliothek zu München, &c.*, and printed in the second volume of the *Serapeum*, pp. 273–318.

¹¹ *Handbuch Deutscher Bibliotheken*, p. 274.

¹² *Ibid.*, p. 101; Compare *Foreign Office Returns* of 1850, p. 347; and also the statements as to the average yearly rate of increase.

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tered "Engl. Test. of a Lollar," and having the "Lessons and Pistles after the use of Salisburi;" a fine copy of the *Koran*, taken from a Turk by a Saxon officer at the last siege of Vienna, and said to have formerly belonged to Bajazet II.; a Greek manuscript of the Epistles of St Paul, of the eleventh century; and a very fine collection of portraits of the most celebrated persons of the seventeenth century, by Rabel, a French artist, the outlines only having been engraved.¹ Ebert's bibliographical MSS. were acquired after his death, and form a special collection, called *Eberti Apparatus Literarius*. There is a manuscript alphabetical catalogue, in 53 volumes folio; and a classed catalogue in about 120 volumes. The library occupies twenty-six light and elegant apartments in the Japanese palace, and the books are separated into classes. The expenses of the Royal Library are defrayed by the State. The sum of 3000 dollars, equal to L.450, is allowed yearly for the purchase of books, &c.² There are several other public libraries in Saxony, of which the most important are the University and Town Libraries of Leipsic. The first-named collection (which dates from 1543) contains more than 120,000 printed volumes, and 2500 volumes of MSS. The printed *Incunabula* exceed 2000 volumes.³ The Town Library was founded by Hulderich Gross, in 1677, and although, up to 1838, it had received no accessions of striking magnitude, it had come to be a very useful collection of about 40,000 printed and 1500 MS. volumes.⁴ In 1838 it received a noble gift, in the bequest by C. H. L. Poelitz, of an excellent political library of 25,000 volumes, with a fund for its future maintenance. This collection is kept distinct from the other portions of the Library. In the aggregate, the Town Library now numbers at least 90,000 printed volumes, and 2000 MSS.⁵ These libraries are freely open to the public, except on Sundays and holidays.⁶

Library of
Göttingen.

The library attached to the University of Göttingen contains about 360,000 printed volumes, and 3000 volumes of manuscripts.⁷ But its extent is its least recommendation; for it is not only the most complete amongst the university libraries, but there are very few collections of any kind in Germany which rival it in real utility. This library is mainly indebted for the pre-eminence it has obtained to the labours and exertions of the illustrious Heyne. In the year in which he came to Göttingen as second librarian, the entire control of the library was committed to him, and he became chief. From this moment commenced at once its extension and its improvement. When Heyne went thither, the library already contained from 50,000 to 60,000 volumes, which, compared with those of most universities, was a considerable collection. At his decease it had, according to the most moderate computation, increased, exclusively of extraordinary acquisitions, to upwards of 200,000 volumes.⁸ The system of catalogues which he established is elaborate but clear. There are, in fact, four catalogues connected with each other, and all of them are MSS. Every addition to the library is first entered in the *Manual* of the year, in which are concisely written the title and date of the book, and the day of its reception. Then the book is entered with its full title in the *Accession Catalogue*, which is also commenced with every year, and forms at its close four volumes; the first containing entries of books on theology;

the second, of books on jurisprudence; the third, of those on history; and the fourth, books in the other classes. These two catalogues are intended more particularly for the use of the librarians; the remaining two are for readers. The third of the series is a complete *Alphabetical Catalogue*, in which every book is entered under the author's name, when given, or, when not given but known, with a reference thereto under the chief word of the title. Every book of which the author's name is not known, is entered under such chief word of title; and, on one side, are also entered the date and form, with reference to the entries of the same book in the *Manual* and the *Accession Catalogue*; on the other is entered that heading in the classed catalogue to which the book belongs. Lastly, the book is entered in the *Classed* or *Scientific Catalogue*, according to its subject, and is then placed in its appropriate division of the library. Thus, the *Alphabetical Catalogue* answers the question, whether or not the known book of a known author, or the anonymous book of which the title is accurately remembered, is in the library, and, if there, where it is to be found; and the *Scientific* or *Classed Catalogue* shows what books are contained in the library upon any given subject. Such is a brief account of the mechanism of this very useful library.

Foreign
LibrariesRoyal li-
brary at
Berlin.

The Royal Library at Berlin contains nearly 500,000 volumes of printed books, and about 10,000 volumes of MSS. This collection includes works upon almost all the sciences, and in nearly all languages, but it is perhaps most complete in the sciences. Amongst the MSS. are several Egyptian deeds, written on papyrus, in the demotic or enchorial character, but whether with or without Greek registries, we have not ascertained. Professor Kosegarten, in his *Commentary on the Ancient Literature of the Egyptians*,⁹ has published facsimiles of a considerable portion of one of these, and of the *exordia* of twelve others, with interlinear translations in Latin, according to Dr Young's method of interpretation. Its Oriental section is very rich, and comprises the entire series of Sanscrit MSS. which had been formed by Sir R. Chambers, chief-justice of Bengal. The MS. department also includes several MSS. of Veyssière de Lacroze, the celebrated author of the *Lexicon Egyptiaco-Latinum*, once librarian here, and, amongst them, his reply to Bergier, in which he mentions the additions made to the Royal Library, the librarians, the number of books at the time when he wrote, and the curious articles contained in the collection. The *Alphabetical Catalogue* of this most extensive library is very complete; and six persons have been regularly employed in preparing a revised, or rather a new, classed catalogue. The former extended, in 1851, to upwards of 650 MS. volumes; the latter exceeded 250.¹⁰ Two volumes of a new printed catalogue of the MSS. have been published. The sum ordinarily allotted to acquisitions is about L.1800 a-year; but this amount is sometimes considerably increased by special grants,—as, for example, on occasion of the purchase of the Meusebach collection,—and at other times, when the latter have been of unusual cost, somewhat diminished.¹¹ There is perhaps no library in Germany which is now more efficiently conducted. Among early printed books there are several block-books;—the *Rationale* of Durandus, 1462, on vellum; the Aldine Petrarch, 1501; also,

¹ *Voyage au Nord de l'Europe*, vol. i., p. 71, et seqq.² Petzholdt, *Handbuch*, ut supra, p. 234.³ Appendix to Report on the British Museum, p. 495.⁴ *Foreign Office Returns* of 1850, p. 262. The official statement runs thus:—"In the University Library, there are nearly (ungefähr) 350,000 volumes of printed books, counting each individual volume, whether it be a [bound] pamphlet of a few leaves, or a volume containing 50 or more Tracts or Dissertations bound together." This is precisely the mode of enumeration which has been adopted at the British Museum (Panizzi, *Evidence before Brit. Mus. Commission*, 1849, p. 261); and if it were uniformly followed, would afford a firm and ample foundation for the comparative statistics of libraries.⁵ *Foreign Office Returns*, ut supra, p. 304; Comp. Petzholdt, *Handbuch* (1853), p. 36.⁶ *De Prisca Egyptiorum Literatura Commentatio I.* (Vimaribus, 1828, 4to.)⁷ Pertz, *Die Königliche Bibliothek in Berlin in den Jahren 1851-53* (Berlin 1854, 8vo), p. 1.⁸ *Foreign Office Returns*, 1850, p. 345.⁹ *Ibid.*, p. 229.¹⁰ *Ibid.*, p. 230.¹¹ Pertz, in *Serapeum* (1852), vol. xiii., p. 20.

Foreign Libraries on vellum, Luther's Bible. The collection of historical portraits amounted in 1851 to nearly 30,000.¹

Library of Stuttgart The Public Library at Stuttgart contains about 245,000 printed volumes, and 3230 MSS.² The collection was formed—first at Ludwigsburg in 1765, and removed to Stuttgart ten years afterwards—by the purchase of private libraries, the union of some State libraries, and those of suppressed monasteries. It is divided into three departments, each of which is under the superintendence of one of the librarians, who are charged with the purchase and binding of books, the keeping of catalogues, and other duties. The general government of the library is vested in directors, who endeavour, as far as their means allow, to procure everything that is of real worth. All booksellers in the kingdom are required to furnish a copy of every work published by them. To certain persons, and under certain regulations, books are allowed to be lent out from the library. The ordinary annual expense of the establishment amounts to about 9000 florins (L.750), of which about 6000 (L.500) are expended in the purchase of books; and it is defrayed out of the public treasury. The collection of Bibles is said to be the largest in the world, amounting to 8544 volumes, in sixty different languages. Such anxiety is felt to make this Biblical series as complete as possible that, a few years ago, a set of the *Acta Sanctorum* of the Benedictines was given in exchange for a copy of the famous *Psalter* of 1457. The University Library at Tübingen contains about 200,000 printed volumes; 50,000 dissertations, and 2000 MSS.³

Other German Libraries. The present Ducal Library of Wolfenbüttel dates from 1604, and is little inferior to that of Stuttgart; it contains at least 190,000 printed volumes, with more than 4000 manuscripts.⁴ Its choice treasures, both of MSS. and of early printed books, are numerous, and have been well described by Dr Schönmann.⁵ Here, too, the collection of Bibles is large and precious. Besides the libraries connected with various public institutions, such as the Senkenberg Museum, and the Staendel institution for the fine arts, there is a public library at Frankfurt, called the Town Library, in a handsome modern building facing the river. In the vestibule are various Roman antiquities found in the neighbourhood. This collection contains nearly 80,000 volumes of printed books, and 1000 volumes of MSS.,⁶ of which 20 are Abyssinian, 12 Turkish and Persian, 6 Hebrew, 2 Indian and Burmese, and the rest in Latin, German, and other languages. No catalogue of this library has been published since 1728; but there are good MS. catalogues. The annual expense, which amounts to about 5200 florins (L.434), is contributed by the public treasury.⁷ The Library of Naumburg was founded in the sixteenth century by Julius Pflug, bishop of that place, who is celebrated in ecclesiastical history as a zealous opponent of the Reformation, and as one of the three divines deputed by Charles V. to draw up the plan of the *Interim* in 1548. In the seventeenth century this library received a further augmentation by the purchase of the collection of books formed by Thomas Reinesius. The printed books and MSS., though few in number, are of considerable value. Amongst the latter are—the *Scholia* of Olympiodorus

on several of Plato's *Dialogues*, written in the sixteenth century; a fragment of Orpheus's *Argonautics*, of the fifteenth; the *Olympic Odes* of Pindar, of the sixteenth, apparently transcribed from an ancient manuscript, and including critical notes by Richard Croke; the *Cassandra* of Lycophron, with the *Commentary* of Tzetzes, dated 1438; and several tracts of Jamblichus on the Pythagorean philosophy, belonging to the fifteenth century.⁸ At Nuremberg the public library—founded by Conrad Kühnhofer in 1445—was, in 1538, deposited in the Dominican Monastery, where it still remains. It possesses more than 50,000 volumes of printed books, 900 of which are *Incunabula*. The MS. collection amounts to about 800 volumes, and includes many interesting illuminated manuscripts, with autograph works of Luther, Hans Sachs, the famous German poet, and Albert Durer. One of the volumes is a Latin Breviary of the middle of the fourteenth century, richly illuminated, presented, according to the French inscription, by Charles, King of France, to Madame the Queen of England. This, says Von Murr, was either Isabella, wife of Richard II. (1396), or Catharine, wife of Henry V., King of England. They were both daughters of Charles VI., King of France. An account of the MSS. and early printed books is given in the work of Von Murr, entitled, *Memorabilia Bibliothecarum Publicarum Nurembergensium et Universitatis Altdorfinae*, Nuremb. 1786–91, 3 vols. 8vo. Nuremberg also possesses three several church libraries, all of which were founded prior to 1625, and one of which—the Fenitzer-Dillherr Library—possesses at least 10,000 volumes. In 1852 the foundation of a new library, with reference especially to Germanic history, was laid by the liberality of the Baron Von Aufsess, and is, we believe, making progress.⁹

The Public Libraries of Hamburg are numerous and important. Those of chief note are the City Library and the Commercial Library. The former was founded in 1529, and now contains about 200,000 volumes of printed books, exclusive of a series of Dissertations, the number of which is nearly 20,000. The MSS. are about 5000.¹⁰ The Commercial Library dates from 1735, contains more than 40,000 printed volumes, and is unquestionably the best special collection of its kind in Europe. It has no MSS. of much importance, save on the history of Hamburg itself. On this subject there is a very valuable collection of books and documents, partly printed and partly MS. There is also an extensive collection of maps and charts.¹¹ The catalogue of the Commercial Library is according to subjects, and is printed up to the end of 1853.¹² The catalogues of the City Library remain unprinted. Its manuscript Alphabetical Catalogue fills 40 volumes in folio. Among the MSS. is an early *Homeri Odyssea* in Greek, on charta bombycina; a Latin *Æsop*, with curious drawings; the Gospels in Greek from Uffenbach's Library; and an interesting series of autograph letters of the German Reformers. Many valuable printed works might also have been specified, had the limits of this article permitted.

In Heidelberg, the present University Library dates from 1703, and now contains about 150,000 printed volumes;

¹ *Serapeum*, ut supra, p. 18.

² *Foreign Office Returns* of 1850, p. 377.

³ Dr Petzholdt (*Handbuch*, p. 404), after stating that the number of printed volumes at Wolfenbüttel has been repeatedly but erroneously said to be 270,000, and that of MSS. 10,000, inclines to assign to it about 200,000 of the former, and 5000 of the latter; but there is reason to think that even this is an over-statement.

⁴ *Hundert Merkwürdigkeiten der Herz. Bibliothek zu Wolfenbüttel* (Hann. 1849, 8vo).

⁵ Petzholdt, *Handbuch*, p. 126; Compare *Foreign Office Returns*, 1850, p. 260. The latter account is of a date anterior to the Schlosser bequest to the library.

⁶ Müller, *Notitia et recensio Codicum Manuscriptorum qui in Bibliotheca Numb. asservantur* (1806–1811), as quoted in Horne's *Introduction to Bibliography*, vol. ii., p. 582.

⁷ *Foreign Office Returns*, ubi supra.

⁸ *Ibid.*, pp. 179–189; Comp. *Foreign Office Returns* of 1850, p. 267.

⁹ Hoffman, *Die Commerz-Bibliothek in Hamburg* (Leipzig, 1849, 8vo), pp. 11–16; *Foreign Office Returns*, ut supra.

¹⁰ *Katalog der Commerz-Bibliothek in Hamburg* (1841, 4to); *Mit vier Fortsetzungen* (1844–53, 4to).

¹¹ Petzholdt, *Handbuch*, ut supra, pp. 279–283.

¹² *Ibid.*, pp. 179–189; Comp. *Foreign Office Returns* of 1850, p. 267.

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Libraries

50,000 Dissertations, and more than 3000 MSS.¹ Of the latter the most precious are those which had formed part of the ancient *Bibliotheca Palatina*, and which were restored under the circumstances we have narrated in our account of the Vatican Library. Among these are the famous Greek manuscripts of Xenophon, Thucydides, and the *Anthologia* of the tenth and eleventh centuries; Ottfried's metrical version of the Gospels, of the ninth century; and a volume of old German poems and romances. At Bonn, Breslau, Erlangen, Giessen, Halle, Königsberg, Marburg, and Treves, there are also valuable libraries.

V. HOLLAND.

Dutch Li-
braries.

There are many libraries in Holland; indeed almost every city has one; but the principal collections are the University Libraries of Leyden and Utrecht, and the Royal Library at the Hague. The University Library of Leyden was founded by William I., Prince of Orange, and is justly celebrated throughout Europe for the many valuable specimens of Greek and Oriental literature with which it abounds. To it Joseph Scaliger bequeathed his fine collection of Hebrew books; and it was further enriched by the learned Golius, on his return from the East, with many Arabic, Turkish, Persian, and Chaldaic manuscripts. In addition to these, it received the collections of Holmanus; and those—still more important—of Isaac Vossius and Ruhnken; the former, which had to be removed to Leyden from Windsor, contained a great number of valuable manuscripts, supposed to have once belonged to Christina, Queen of Sweden; and the latter, an almost entire series of classical authors, with a collection of manuscripts, amongst which are to be found copies of several that were subsequently consumed by fire in the Abbey of St Germain-des-Prés. A catalogue of this library was printed in 1716, with a supplement in 1749, both in folio.² In 1852 was published *Catalogus Librorum Manuscriptorum qui inde ab anno 1711, Bibliothecæ Lugduno-Batavæ accesserunt*, 4to. It describes 1015 articles. Many fine manuscripts might be noticed; in particular, a Virgil, an Italian transcript of the fifteenth century, illuminated with some large designs on coloured vellum; a volume of Monstrelet's *Chronicles*, in French, of the same age, with illuminations; the Psalter, illuminated, which, according to a French note, was made use of by St Louis in his childhood. It is apparently of the twelfth century (although, in the printed catalogue, assigned to the fourteenth), and written in England, for the English have that name in the calendar. There are various important Greek manuscripts; and among the printed books, the *Justiniani Institutiones*, 1468, and the *Apuleius* of 1468, upon vellum. There is also a copy of the Bible in Dutch, printed at the expense of Peter the First, at Amsterdam, 1721, 5 vols. folio, in capital letters. Half of each page is left blank, and some copies have the Russian text in parallel columns. Most of the copies are said to have been lost at sea. The library at Leyden is computed to contain upwards of 70,000 printed volumes, and 3000 volumes of MSS.,³ many of which, as we have seen, are equally curious and valuable.⁴ Of the public library at Amsterdam, the official statement is simply this, "The number of

printed books is 3150 [31,500?], and of MSS., 88; a printed Foreign catalogue appeared in 1796." Peignot drily remarked of Libraries this collection, many years ago, that it would be more useful if the books were arranged in better order and method.⁵

Of the University Library of Utrecht the precise date of Library of foundation is not recorded. But there is an entry in the the Uni- proceedings of the town-council which directs the bring- versity of ing together of the books of certain monasteries and col- Utrecht. leges, in order to the foundation of a Town Library, in 1581, fifty-five years before the establishment of the present University.⁶ On the conversion, in 1636, of the pre-existing "Athenæum" into a University, the Town Library was transferred to it. Catalogues were printed in 1670, in 1718, and in 1834-35. The last named is alphabetical, and in 2 vols. folio. The number of printed volumes has been estimated at 80,000, and of MSS. at upwards of 860, of which latter there is a written catalogue, well digested. These numbers, however, are but conjectural. The only direct statement we can trace is of 1835, at which date the number of printed *works*—not volumes—was 27,000,⁷ and that of MSS., 864. The MSS. are not of much general interest, being chiefly scholastic divinity, or ecclesiastical records connected with that district of Holland; but there is an ancient Greek Gospel of the ninth century, known as the *Codex Bezae Cantabrigiæ*, and a Latin Psalter of a still earlier period, with curious drawings. Among the printed books there is a splendid volume on vellum, *Missale Trajectense complectis multis missis rotivis nunquam antea impressis*, printed at Paris by Wolfgang Hopyl, 1515, and (from its having escaped the researches of Van Praet) probably unique. But the chief library in Hol- Royal lib- land is the Royal Library of the Hague. In its present shape rary at the and character this collection is little more than half a Hag- century old. But it includes what remained of the fine Library of the Stadtholders, the collection which had belonged to the States-General, and also some smaller libraries of corporate bodies. These were brought together in the *Mauristhuis*, after the flight of William V., and became the foundation of the Royal Library, which now possesses more than 100,000 volumes of printed books.⁸ Amongst these are comprised, (1.) nearly 1400 volumes from the early presses, about 500 of them Dutch; (2.) An Elzevirian collection, amounting to 690 volumes; (3.) Another special collection of the productions of the Aldine, Juntine, Stephanine, and Plantinian presses; and, (4.) A very curious collection of pamphlets on Dutch affairs, called *Bibliotheca Duncaniana*, after its former possessor. The MSS. amount to 2000. Amongst them is a fine Evangelary of the tenth century, which had formerly belonged to the ancient Abbey of Egmont, and a long series of liturgical and other devotional MSS. superbly illuminated. The historical MSS. are very numerous, and contain rich materials for the history of France, as well as for that of the Low Countries.⁹

VI. BELGIUM.

At Brussels there are two principal libraries; both of Belgian which belong to the government. The first of these is de- libraries. signated the Royal Library of Brussels, and was founded on that which formerly appertained to the house of Burgundy.

¹ Petzholdt, *ut supra*, p. 197.

² The quasi-official returns of 1835 referred to in the "Abstract" appended to Mr Disbrow's letter to Lord Palmerston of 6th Nov. 1849 (*Foreign Office Returns*, 1850, p. 300), says:—"Nearly 70,000 volumes, and 3000 MSS." Fourteen years had elapsed between the two applications for information, but the Dutch functionaries refer to the previous replies—themselves very perfunctory—without indicating change or addition of any kind.

³ See also the art. LEYDEN.

⁴ Buchelius, *Descriptio urbis Trajectinæ* (1605), p. 81, as quoted by Grässe, *Zur Geschichte der Holländischen Bibliotheken* (*Serapeum*, Bd. v., p. 322).

⁵ "Het getal boekwerken is aldaar 27,000." App. to Report of Select Committee on British Museum, 1836, No. 10.

⁶ *Foreign Office Returns* of 1850, p. 300.

⁷ Jubinal, *Lettres à M. le Comte de Salwandy, sur . . . la Bibliothèque Royale de La Haye* (1846), pp. 6-39.

⁸ *Foreign Office Returns* of 1850, p. 300.

⁹ Peignot, *Dict. de Bibliologie*, tom. i., p. 99.

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Santander¹ has traced the history of this library through its varied fortunes, it having been successively exposed to the perils of fire, of interment, and of spoliation by French commissaries. Though it had been restored, in some degree, to its ancient splendour by the care of Count de Cobentzel, and of Prince Stahrenberg, minister-plenipotentiary of the Empress Queen, its prosperity was of short duration. For, when the French armies overran the Netherlands, and occupied Brussels, in 1797, Laurent, the representative of the people, caused seven waggon-loads of books and manuscripts to be taken from the Burgundian Library; and some time afterwards, Wailly, Leblond, and others, deputed to commit a second spoliation, selected about 200 manuscripts for the National Library at Paris. In 1797 a place was provided for the reception of the surviving books belonging to the Burgundian Library; and in 1798 the collection was enriched with all that was most valuable from the great dépôt of the Cordeliers, which was then broken up. But the fine library brought together by C. J. E. Van Hulthem, who died in 1832, has been the most important element in the composition of the present royal collection. It had been formed with great judgment, and was especially rich in Belgian history; nor is it undeserving of record that not a few of the volumes of this library had (in a very unusual manner) helped to *make* Belgian history, in some of its not least glorious pages; many a substantial and venerable folio of Van Hulthem's having done duty by way of breastwork for the Belgic volunteers during their obstinate conflict with the Dutch troops in September 1830. This collection amounted to 29,350 distinct printed works, in about 63,000 volumes, and to 1016 MSS. It was purchased by the government in 1837 for L.11,176, exclusive of incidental expenses.² There is a printed catalogue of it, well compiled by Voisin, in 6 volumes 8vo.³ Two years afterwards the conjoined collections, including that of the city, which had been public from 1794 (as that of Burgundy had been from 1772), were opened as the national collection of Belgium. Since that period the Brussels Library has, by systematic acquisitions, become still more extensive, and at present it contains nearly 203,000 volumes of printed books, and about 19,700 MSS.,⁴ each distinct work or article being counted. "Nothing," says a recent reader there, "can exceed the comfort of the reading-room."

The *Archives Générales du Royaume* form the second of the principal collections of Brussels. They unite the characters of a Library of MSS. and of a State Paper Office; the documents they contain extend from the twelfth to the nineteenth centuries; and in 1838 numbered 130,394, classified in fifty-seven divisions.⁵ The collection is of high historical importance, and has been well arranged by M. Gachard. The provincial libraries of Belgium are those of Antwerp, Bruges, Ghent, Liège, Louvain, Mons, Namur, Tournay, and Ypres, three of which (those of Ghent, Liège, and Louvain) are under the direction of the universities established at these places, whilst the others are under the superintendence of the local authorities. Of these provincial libraries, that of Ghent is the largest. It possesses of

printed volumes about 64,500 (of which 480 are *incunabula*), and of MS. volumes 630. Liège has also nearly 64,000 printed volumes, and 480 MSS. Louvain has about 62,000 printed volumes, and 302 MSS.; Tournay, about 27,700 printed, and 208 MSS.; Antwerp, about 22,000 printed, and 29 MSS.; Namur, about 17,700 printed, and 80 MSS.; Mons, about 16,400 printed, and 348 MSS.; and Bruges, about 12,000 printed, and 550 MSS.

Foreign
Libraries

VII. HUNGARY.

Many fragments of that noble library, so rich in valuable manuscripts, which had been formed at Buda by the celebrated Corvinus, have been mentioned in our accounts of the several existing libraries that possess them.⁶ When this collection was dispersed, on the capture of Buda by the Turks, under Solymán, in 1526, Cardinal Bozman in vain offered the conqueror 2000 crowns to restore this part of the spoil. If no collection subsequently formed, up to the end of the last century, could lay claim to the title of a Hungarian national library, yet since 1804, by the liberality of Count Sczecheny, Pesth has become possessed of an assemblage of books, admirably chosen, fast increasing, and well deserving to be styled the library of Hungary. The books are entered alphabetically in the catalogue and supplements, and classed in the indices according to subjects.⁷ The National Library already contains about 185,000 volumes of printed books, upwards of 10,000 MSS., about 10,000 prints, and 5000 maps. Of the printed volumes some 36,000 are Hungarian books; about 20,000 others are works in foreign languages, but relate to Hungary, as does also the bulk of the MSS.⁸ Few libraries, it will be seen, can possess a better title to be termed "National."

Pesth has two other libraries, both of them important. That of the University owes its foundation to the celebrated Primate of Hungary, Peter Pázmány.⁹ From Tyrnau (the first seat of the University), it was transferred to Buda in 1777, and thence, seven years afterwards, removed to the other side of the river. In 1853 it possessed nearly 72,000 volumes of printed books, and 1510 MSS. The third library of Pesth is sometimes called the *Teleki Library*, and sometimes the *Library of the Hungarian Academy of Sciences*. In the Diet of 1826, Count Joseph Teleki, for himself and his brothers, presented to his fellow-countrymen the fine library of 30,000 volumes, which they had jointly inherited from their father. He also presented the sum of 5000 florins by way of beginning a maintenance fund. The example was followed with the old Hungarian spirit, and amongst the earliest imitators the illustrious name of Batthyány twice occurs; Count Casimir as the donor of 2660 volumes, and that of Count Gustavus as the donor of a library containing very nearly 30,000 volumes. A collection, especially rich in Hungarian history, was purchased in 1849 (5000 volumes); and, in 1852, Count Joseph Teleki increased the acquisition fund by a handsome contribution from the profits of his well-known historical work. In the following year the library possessed 70,660 volumes.¹⁰

¹ *Mémoire Historique sur la Bibliothèque Publique de Bruxelles*, Bruxelles, 1809, 8vo. See also Peignot, *Catalogue d'une partie des livres composant la Bibliothèque des Ducs de Bourgogne, au XV. Siècle*. Dijon, 1841. 8vo.

² Scheler, *Gründung der Königlich Belgischen Staatsbibliothek zu Brussel*, 1842 (*Serapeum*, Bd. iii., p. 23).

³ *Bibliotheca Hulthemiana*, 5 tom., Brux., 1836.

⁴ *Foreign Office Returns* of 1850, pp. 160, 161; Comp. De Reiffenberg, *Annuaire de la Bibl. Roy. de Bruxelles*; and Alvin, *Rapport Général sur la Situation de la Bibl. Roy. de Bruxelles*, 1854 (*Serapeum*, 1855, Bd. xvi., Supp. pp. 25-78).

⁵ Gachard, *Rapport sur les Archives Générales du Royaume*, p. 57.

⁶ The best account of the survivors of this famous collection yet published is to be found in Vogel's *Verzeichniss Corvinischer Handschriften in öffentlichen Bibliotheken*, 1849 (*Serapeum*, Bd. x., pp. 273-205). The inquirer will do well to glance also at the article "Corvin," (by M. Gley,) in the *Biographie Universelle*.

⁷ *Fragmenta veteris Typographiæ Magno-Varadensis*, Pesth, 1801, in 8vo. M. de Miller, librarian to Count Sczecheny, having discovered several works printed at Grosvaradin in the sixteenth and seventeenth centuries, published an account of them at Pesth in 1804.

⁸ Petzholdt, *Handbuch*, *ut supra*, pp. 293, 294; 439-440.

⁹ And not, as Mr Kohl has said (*Austria*, Engl. Trans., p. 244), to the Emperor Joseph II. This library sustained some injury—but none irreparable—in the great inundation of 1838.

¹⁰ Petzholdt, *Handbuch*, *ut supra*, p. 438.

Foreign
Libraries

VIII. BOHEMIA.

National
Museum
library of
Prague, &c.

In the city of Prague there is a library in connection with the National Museum, founded in 1818, consisting of more than 20,000 volumes of printed books, and 1200 volumes of MSS.¹ It is remarkable on account of the number of early works illustrative of Bohemian history and literature, from the first book printed in Bohemia (1462); and is open to all comers. Among other rarities, there is exhibited an original letter, signed "Johanes Hus, Magistre in Artibus, Sacre Theologie Baccalareus." The University of Prague has a fine library, which, in its Carolinian germ, dates, like the University itself, from the middle of the fourteenth century, and contains some relics of a library still older,—that of the Celestine Monastery of Oybin, in Upper Lusatia.² In 1621 both University and library were handed over to the Jesuits, and the latter, in subsequent years, was largely augmented by them. It became well known as the Clementine Library. Joseph II. restored the University to its independence, and vested in it the enlarged collection, which was further increased, first, by the books of dissolved monasteries, and subsequently by purchases. The University Library is well organized. When Mr Kohl visited it in 1841, he was shown a catalogue so arranged that the sum total of volumes could be added up daily. It was then 99,888.³ In 1848, it was 106,735.⁴ The present number of volumes is probably at least 110,000. There are many curiosities, and amongst them a superbly illuminated Hussite *Hymn Book*, the joint-stock production of the chief families and most eminent guilds of Prague. Prague has many other remarkable libraries, which we cannot find room even to enumerate. One, however, may claim a word. The Premonstratensian Monastery of Strahow has a library of great value, displayed in an apartment which, for splendour and elegance, has, it is said, scarcely its equal either in the Austrian States or in Germany.⁵ The number of printed volumes exceeds 50,000 (2000 *incunabula*), and that of MSS. is about 1000.⁶

IX. SWITZERLAND.

Libraries of
Geneva, &c.

In Switzerland there are several libraries eminently worthy of notice. We begin with that of Geneva. The celebrated Bonnard, prior of St Victor, having promised to bequeath his books for the foundation of a public library in Geneva, the council of that city resolved to act upon this promise, and in 1564 purchased the books which had belonged to Calvin, and in 1565 those of Peter Martyr. The progress of the library is detailed in the preface to an excellent *Catalogue de la Bibliothèque Publique de Genève*, by L. Vaucher, 1834, 2 vols. 8vo, when the library contained 31,000 volumes. Among Bonnard's books are several rare editions of the fifteenth century, such as Cicero's *Offices*, both editions, 1465 and 1466, on vellum (the first of them presented by Lord Stanhope); the *Livre des Saintes Angles*, the first book printed at Geneva, in 1478; the *Speculum Vitæ Humanæ*, printed in the Canton of Lucerne in 1472 or 1473; the *Mirouer du Monde*, Geneva, 1517, the only known copy printed on vellum. Among the manuscripts are several richly illuminated. Here also is that most interesting little volume, *La Noble Leyçon*, dated in the year 1100, and including two other treatises

and seven religious poems, in the language of the Vaudois; and, above all, the manuscripts of Calvin, and his correspondence, in many volumes, as described by Senebier in his *Catalogue raisonné des Manuscrits conservés dans la Bibliothèque de la Ville et République de Genève*, 1779, 8vo. The present number of volumes is about 47,000 printed, and 200 MSS.⁷ In 1852 Tutor Weizel made his valuable private collection of German literature publicly accessible. It is said to amount to 8000 volumes,⁸ and may probably become hereafter an important addition to the Town Library.

Zurich possesses two public libraries,—the Town Library and that of the Cantonal Schools;—the former with about 62,000 volumes of printed books, and 3500 MSS.; the latter with 27,000 printed volumes, and very few MSS. The Town Library was founded, jointly, by four young citizens in 1629, on their return from a European tour, which had made them acquainted with many such institutions. Amongst its MSS. the most remarkable volumes are the original letters of Lady Jane Grey and the English reformers to Bullinger, which have been printed for the Parker Society. In Berne the public library, which dates from 1548, contains 49,500 printed volumes, and 2303 MSS.⁹ Of the latter there is a catalogue by J. R. Sinner, in three vols. 8vo.¹⁰

In Basel the University Library possesses several early Greek manuscripts, such as a copy of the Gospels of the ninth, and the Epistles of the tenth century; the Acts of the Council of Basel (142), in several volumes; original unedited letters of Erasmus; also a copy of his *Morie Encomium*, with spirited sketches on the margins by Hans Holbein (some of them apparently retouched and injured), which have been several times engraved; various drawings by the old German masters, including several by the Holbeins, and a portrait of Edward VI. when a boy, marked "H. H." The total contents of the University Library amounted in 1853 to 75,000 printed, and nearly 4000 MS. volumes.¹¹ The library is more especially strong in the physical and mathematical sciences, in theology, and in the polite literature of Germany. According to the recent rate of increase, the number of printed books in this library must at present amount to at least 78,000 volumes.

The canton of Aargau acquired by purchase, in 1804, the valuable collection of General Zurlauben of Zug. The books of secularized monasteries served to augment the Cantonal Library thus begun, and it has also been occasionally increased by purchases. In 1846 it contained about 60,000 printed volumes, and 1200 MSS.¹² The Cantonal Library at Lausanne contains about 45,000 vols. of printed books,¹³ and, perhaps, 300 MSS. But for a long period, Lausanne possessed a literary treasure which had more powerful charms for British eyes than anything they could see in the public library. Few great writers mention their books so frequently or so fondly as does Gibbon; and it is scarcely credible that he would have left his beloved authors behind him with such slender precautions for their safety, had he departed from Lausanne under circumstances of less excitement and alarm than those of May 1793. Nor is it less extraordinary that, after its preservation for many years in an uninhabited house, his library became the property of another English author, who, to use his own characteristic words, "bought it to have something to read when he passed

Foreign
Libraries¹ Petzholdt, *Handbuch*, ut supra, p. 301.² Petzholdt, *Bibliothek des Celestiner-Klosters auf dem Oybin*, 1840 (*Serapeum*, Bd. i., p. 157, et seqq.).³ Kohl, *Austria*, p. 35.⁴ Murray, *Southern Germany*, seventh edition (1855), p. 459.⁷ *Foreign Office Returns* of 1850, p. 366; Comp. Petzholdt, ut supra, p. 140.⁹ *Foreign Office Returns*, p. 354; Petzholdt, p. 428.¹⁰ *Catalogus Codd. MSS., Bibliothecæ Bernens. annotat. crit. illustratus*, Bern., 1760-1762.¹¹ Petzholdt, *Handbuch*, ut supra, p. 24.¹² Kurz and Weissenbach, *Beiträge zur Geschichte der Stadt Aarau*, pp. 107, et seqq.¹³ Petzholdt, ut supra, p. 223.⁴ *Foreign Office Returns* of 1850, p. 110.⁶ Petzholdt, *Handbuch*, ut supra, p. 302.⁸ Petzholdt, ut supra, p. 140.

Foreign
Libraries

through Lausanne,¹ shut himself in it from morning till night during forty days, and then "dashed among the mountains," never to set eyes upon it again (although he survived his purchase a quarter of a century), leaving it still in a house which was usually untenanted.² At length, forty years after Gibbon had fled from Lausanne in hot haste, this precious collection was sold by auction: part went to America, part to the Cantonal Library. Other portions were scattered far and wide, carrying with them, however, traces of two names, suggestive of very different ideas: the one, a monument of what genius can accomplish when aided by self-denying labour; the other a monition, that vast wealth, unusual powers of mind, and refined tastes, may all centre in one man, and yet leave him at the end of a long life, a prodigal and worthless egotist.

X. POLAND

Libraries
of Poland.

Of Poland it may be said, in a bibliographical as well as political sense, *Stat magni nominis umbra*. The literary treasures of that ancient kingdom have gone to enrich its principal spoiler; and it is at St Petersburg rather than at Warsaw that we must seek for evidence of what it originally possessed. What is called the Royal Library at Warsaw is said not much to exceed 20,000 volumes, most of which are modern; but it contains a manuscript, in 3 folio volumes, with nearly 200 fine drawings, descriptive of the antiquities excavated at Velleia, between the years 1760 and 1765. The University of Warsaw, founded by the Emperor Alexander in 1816, had accumulated a library of about 150,000 volumes; but after the events of 1830 and 1831, every book or pamphlet in it conceived to be hostile to the Russian government was removed, and many scientific works have likewise, it is believed, been abstracted and sent off to St Petersburg. As late, however, as 1849, we find mention of this library as being "said to contain 150,000 [printed] volumes, and a great number of scarce and curious MSS."³ If this be not merely a repetition of preceding statements, it may suggest the idea that the two Warsaw collections have perhaps been united. (?) But it is a significant circumstance, that, although the Russian official returns of 1850 enumerate thirty-eight libraries in addition to those of St Petersburg⁴ (some of them containing less than 500 volumes), there is no mention of any library at Warsaw. The University of Cracow, founded by Casimir the Great in 1343, has a library said to contain about 10,000 MSS., amongst which is a Latin Encyclopædia, in a large folio volume, written by Paul of Prague in 1459, and nearly 50,000 volumes of printed books.⁵ But the most extensive and valuable collection that has ever existed in Poland was that which Count Joseph Zaluski and his brother had formed, and which, in 1747, was devoted to the public. The Zaluski Library, afterwards called the Library of the Republic, consisted of 300,000 volumes, including

upwards of 50,000 duplicates, which were subsequently disposed of; and by the sale of these, together with the losses sustained by various depredations, the collection was supposed, in 1791, not greatly to exceed 200,000 volumes. At length, in 1795, this library was unceremoniously seized by Suwarof, hastily packed up, and despatched to St Petersburg, to aggrandise the capital of the conqueror with the literary spoils of Poland.⁶

Foreign
Libraries

XI. RUSSIA.

To this act of spoliation the Imperial Library of St Petersburg owes, if not its existence, at least its first "acquisition" of importance. Nor is it needful to dwell upon dates. If, with Bacmeister, we even trace some beginnings of the Imperial Library as far back as the year 1714, we shall still find the sapling of like origin with the graft. The books of 1714 were seized during the invasion of Courland, just as the books of 1795 were snatched in the swoop on Poland. Nor does the courtly academical think fit to affect the smallest prudery about the matter. "It was thus," he says, "that Paulus Emilius, the conqueror of Perseus, carried to Rome that monarch's books—the first that were seen in the capital of the world. Thus Sylla, after subjugating Athens, gathered from Athenian books a library alike extensive and choice. Peter the Great followed in the footsteps of these great men."⁷ Could Bacmeister have foreseen the achievements of 1795, his vocabulary would scarcely have supplied words sufficiently eulogistic. Later writers, however, have sometimes thought it desirable to fortify Russian practice by modern examples. But the parallel limps. The French, when they conquered Italy and Belgium, stripped the libraries of those countries, indeed, of some of their choicest rarities. But the Russians, when they triumphed over the independence of Poland, carried off, in bulk, the largest collection of books which that country could boast of. The library thus seized had been built up with refined tastes and liberal sympathy. The library into which it was transformed has often been augmented with lavish expenditure; but the dominant spirit that has animated its management has been narrow, jealous, and servile. The one was free to all comers;⁸ the other has been open to everybody—who was in no respect obnoxious to the Russian police.⁹ In the space of forty-three years Count Joseph Zaluski had acquired, at his own expense, above 200,000 volumes. His brother, Andrew Zaluski, Bishop of Cracow, enriched this numerous collection, as well with the books bequeathed to him by the last descendant of John III., King of Poland, as with those which he collected from the libraries of his uncles, Andrew Olszofski, Primate of the kingdom of Poland, Prince Andrew Chrysostom, Bishop of Warmia, and Louis Bartholomew, Bishop of Plock; and after having joined to these the collection in his own cabinet, he transferred the whole, in 1742, to a house which

¹ "Recollections of the author of *Vathek* (*New Monthly Magazine*, vol. lxxi., p. 308).

² Matthews' *Diary of an Invalid* (1820), p. 319.

³ Murray's *Handbook for Russia*, &c., new edition (1849), p. 593.

⁴ *Foreign Office Returns*, 1850, pp. 339, 340.

⁵ Petzholdt, *ut supra*, p. 218.

⁶ It seems almost too poetically fitting to be literally true (under existing circumstances), that the Zaluski Palace at Warsaw has been purchased by a wealthy Polish nobleman, the Marquess Wielopolski, for the establishment of a national library. Some of our readers, however, may remember to have seen the statement in the newspapers early last year (1856). What foundation there may have been for the assertion we do not know.

⁷ Bacmeister, *Essai sur la Bibliothèque de l'Académie des Sciences de St Petersburg* (1776), p. 47.

⁸ . . . "In ornamentum Patriæ, Civiumque suorum perpetuam utilitatem,

Publicam esse voluit:

Adolescentibus illicium, senibus subsidium,

Otiosis spectaculum, occupatis divitiolum,

Studiosis negotium,

Conditori gloriosum monumentum"—

Such were the words of the inscription on the Zaluski Library.

⁹ It would, however, be unjust to state thus much of truth as to the past, without adding that there is some reason to believe that under the present emperor, and under the able administration of Baron von Korff, as chief librarian, greater liberality is likely to characterize the future.

Foreign
Libraries

had previously belonged to the family of Danilovitch, and had probably come to him by inheritance. In 1747 he rendered it public, and settled an annual income or endowment for its support and increase. In the very year in which it was thus made accessible, we find it described as being already "a splendid, unequalled, and, in regard especially to its stores of Polish history, an inestimable library."¹ After the death of this prelate, Count Joseph Zaluski still further augmented it by the addition of a great number of volumes, and, by his will, made in 1761, bequeathed it, along with the house in which it was deposited, to the college of Jesuits at Warsaw,² in trust for the public. After the suppression of that order in 1773, it was placed under the care of the Commission of Education, and at last seized and carried off to St Petersburg in 1795, as already narrated. This transportation being made by land, and along roads which the late season of the year rendered almost impracticable, many boxes of books suffered from the inclemency of the weather, others were broken or damaged, and the works which they contained spoiled, misplaced, or separated, and the sets broken. The collection was conveyed to the imperial cabinet in two convoys, and after the inventory had been completed on the 23d of February 1796, it was found that the collection still amounted to 262,640 volumes, and 24,573 prints. This library comprised in general all the best works, up to the middle of the seventeenth century, in the sciences, the arts, and the belles-lettres. The theological, and, after it, the historical and literary branches, were the most considerable. The theological department alone comprehended above 80,000 volumes. It was also rich in topography, especially in the histories of towns; and the literary branch included a precious collection of classical books and works on bibliography; but the departments of philosophy, mathematics, physics, travels, and antiquities were very incomplete.³ Such was the foundation of the Imperial Library at St Petersburg. But for the spoils of Poland, that collection, instead of now ranking in the first class, would scarcely, perhaps, have been entitled to a place in the third.

This library, augmented by various other collections, and by purchases both extensive and systematic, amounted, in 1849, to 451,532 printed volumes, and 20,689 volumes of MSS.⁴ Of late years, the official reports have been annually published in the *St Petersburg Zeitung*, and reprinted in the *Serapeum*. We gather from them that in some years (as in 1855, for instance, notwithstanding the war), the accessions, from all sources⁵ together, have reached 15,000 volumes.⁶ Probably, for the entire period from 1849 to 1857, they will have averaged 8000 volumes a-year. On this basis the present total would be 519,500 volumes and about 21,000 MSS. Its management is detailed at length in the Appendix to the *Report of the Select Committee on the British Museum* (p. 449, *et seqq.*). Supplementary information of later date will be found amongst

the Foreign Official Returns appended to the *Report from Foreign Select Committee on Public Libraries* of 1850; to both of which we refer.

The Library of the Academy of Sciences at St Petersburg Library of the Academy of Sciences. was drafted from that early "Imperial Library," the origin of which we have already narrated; and the bulk of which Catherine I., in 1726, presented to the newly-instituted society. It continued to increase, by the bounty and by the enterprise of succeeding czars. Bacmeister (whom we know already) has minutely chronicled its progress: after telling of the many collections it had successively absorbed, he breaks into this philosophical reflection,—“It is an astonishing thing that war, which everywhere else has been fatal to the sciences, has in Russia been advantageous to them. It was war that favoured the first establishment of our library, and it is to war that we are indebted for the chief additions that have been made to it.” But, since Bacmeister's days, other sources of augmentation have assisted its growth. In 1802, for instance, it received an important addition in the library and cabinet of Count Boutourlin, purchased by the Emperor Alexander. It is also entitled to a copy of every book printed within the Russian dominions. This collection contained, on the 1st January 1849, a total of 112,213 volumes (including MSS. as well as printed books), of which 24,933 were Russian, and 87,280 foreign. There were besides 6688 printed books and MSS. set apart in the "Asiatic Museum" of the Academy.⁷

The third public library of St Petersburg is that of the "Roumianzoff Museum," which became a public establishment in 1827. It contained, in 1849, 32,258 printed volumes, 965 MSS., 4620 prints, and 590 maps, &c.⁸ The Imperial Private Library is in the Palace of the Hermitage. It includes the Library of Diderot, purchased by the Empress Catherine in his lifetime, with permission to the vender to become its usufructuary for the remainder of his days; and also a considerable collection of the papers of Voltaire. It is a splendid library of more than 80,000 printed volumes,¹⁰ besides its fine MSS.; of the Voltairian portion of which M. Léonzon-Leduc has given an excellent account in the report above quoted.

XII. DENMARK.

There are three public libraries at Copenhagen, viz., Libraries the King's Library, the University Library, and Classen's at Copenhagen. Library. The Royal Public Library of Copenhagen dates its first commencement from the middle of the sixteenth century. In 1665 Frederick III. established it in its present building, and largely improved the collection. It now contains—according to the official reports—nearly 408,000 volumes of printed books, and about 15,000 MSS.¹¹ The University Library was originally founded prior to 1500;

¹ Janozki, *Nachricht von denen in der Hochgräflich Zaluskischen Bibliothek sich befindenden raren Polnischen Büchern* (Dresd. 1747, 8vo), p. 5.

² "The celebrated Library of Zaluski at Warsaw," says Denis, in his *Introduction to the Knowledge of Books*, "was opened to the public in 1747. It must contain at present near 300,000 volumes. Benedict XIV., in 1752, issued a bull of excommunication against those who should dare to commit depredations on this library; but, notwithstanding, many books were carried off, particularly during the late troubles. In 1747, the laborious librarian, Janozki, gave notices of the rare books printed in Polish; and, in 1752, he published a catalogue of the manuscripts in this library. After the death of its founder, the Bishop of Kiev, the king and the commonwealth took possession of this treasure, in spite of the attempts made by the heirs to retain it." (Denis, *Einleitung in die Bücherkunde*, Wien, 1777, th. i., p. 184.)

³ See *Précis Historique sur la Fondation, l'Acquisition, et l'Arrangement de la Bibliothèque Impériale*, Appendix to Report, p. 457, *et seqq.*

⁴ *Foreign Office Returns*, 1850, p. 338.

⁵ Amongst these sources we find one, the official mention of which runs thus:—"Besides the taxed or censorship copies (*Censur-Exemplaren*), the library received gratis from the officers of customs, in pursuance of an enactment of 1854, about 2000 volumes which had been confiscated for various reasons (*die aus verschiedenen Gründen confiscirt worden waren*"). *Jahresbericht der Kaiserl. Oeffentlichen Bibliothek zu St Petersburg*, für 1855, § iv. A.

⁶ *Jahresbericht*, &c., *ut supra*, § iv. D.

⁷ *Foreign Office Returns*, 1850, p. 339.

⁸ *Ibid.*, p. 338.

⁹ Bacmeister, *Essai*, *ut supra*, p. 61.

¹⁰ *Rapport adressé à M. de Salvandy, Ministre de l'Instruction Publique, par M. Léonzon-Leduc, chargé d'une mission littéraire en Finlande et en Russie*, &c., Oct. 1847. (*Archives des Missions Scientifiques*, 1850, tom. i., p. 39.)

¹¹ *Foreign Office Returns*, 1850, p. 176.

Foreign
Libraries

was destroyed by fire in 1730; and soon afterwards restored. It now contains nearly 154,000 printed, and 4000 MS. volumes. Classen's Library contains about 30,000 printed volumes, but possesses no MSS. These libraries, consisting of upwards of 600,000 volumes, printed and MS., are accessible to all respectable householders, and likewise to strangers introduced by such; and the books are, besides, under certain restrictions, allowed to circulate. The King's Library is general, and about equally complete in all the branches of human knowledge. The University Library is also to a certain extent general, but the main body of the collection has been made chiefly with reference to academical education. Classen's Library consists principally of books of geography, travels, natural history, and agriculture. The administration of these libraries seems to be both economical and efficient, and to be conducted solely with a view to public utility, which, in this case, means public instruction.¹ Of the principal catalogues of those Danish libraries we give a list below.²

XIII. SWEDEN AND NORWAY.

Royal Li-
brary, &c.,
of Sweden.

The public libraries in Sweden are, (1.) the Royal Library, situate in the northern wing of the king's palace at Stockholm; (2.) the library called *Benzelstjerna-Engeström*, founded by private individuals, but to which admission is readily granted on recommendation. These are in the capital. The Royal Library, which was founded by Gustavus Vasa about 1540, and enlarged by the liberality of succeeding sovereigns, contains about 96,000 volumes of printed books, with nearly 4000 MSS.,³ besides 16,500 charters and deeds, and is open to the public every day excepting Saturdays, Sundays, and holidays; books are lent out on respectable recommendation. The Library of *Benzelstjerna-Engeström* contains about 14,500 volumes of printed books, and 1200 volumes of MSS., rich in materials for Swedish history.⁴ Besides these, there are libraries attached to the different academies, which are also accessible. The number of provincial libraries in Sweden, including those of the Universities of Upsal and Lund, is nineteen. That of Upsal, which was founded by Gustavus Adolphus, is the largest in Sweden, and contains more than 135,000 printed volumes, with nearly 7000 MSS.⁵ A catalogue of the collection, by Professor Aurivilius, was printed in the year 1814, in 2 vols. 4to. The Library of Lund was founded at the same time as that university (1671) by Charles X., and possesses upwards of 70,000 printed volumes, and 2000 MSS.⁶ These libraries are supported and increased by an annual grant from the state, and by a fee paid by each student on entering the universities. In those provincial towns where large public schools, called *Gymnasia*, are established, there are also small libraries. These collections, which have been founded by private individuals, are kept up much in the same way as those belonging to the universities.⁷

Libraries in
Norway.

At Christiania, in Norway, the Library of the University contains about 115,000 printed volumes, and 600 MSS.⁸ It was founded, in 1811, upon a donation by the King of

Denmark of many thousand volumes of duplicates selected from the Royal Library at Copenhagen, when the extensive and valuable collection of Count Suhm was acquired.

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Libraries

There are six other libraries of some importance in Norway,—two of which are in the capital,—besides a very large number of school and village libraries. Of the former the most extensive is that of Trondheim, counting 26,000 printed volumes, and 800 MSS. The two smaller Christiania libraries have each of them about 12,000 printed volumes. That called *Deichman's Library*, possesses also 320 MSS.⁹

But the MSS. at Upsal, and those at Stockholm, are almost the only MSS. in the kingdom of Sweden and Norway which possess interest of a high order for strangers, as well as for natives. The Upsal collection includes the famous *Codex Argenteus*, containing the Gothic Gospels of Ulfilas. It was amongst the spoils seized by the Swedes at the storming of Prague, in 1648; and after passing successively through the hands of Queen Christina, of Isaac Vossius, and of the Count de la Gardie, was presented by the latter to the University of Upsal. It is, and in modern days has always been, imperfect; but ten leaves of it are said to have been recovered at the end of 1856. It has been recently and ably edited by Dr Massman. Amongst the surviving treasures of Stockholm (the Royal Library suffered severely by fire in 1697), is a golden book which has had even stranger vicissitudes than the silver book of Upsal. The Latin Evangeliary, which is called *Codex Aureus*, bears an inscription in Anglo-Saxon, recording its rescue "from a heathen war-troop, with our pure treasure," by "Alfred, and Werburgh, his wife." Long after this incident it found its way to Madrid, where, in 1690, it was purchased by Sparvenfeldt, and carried into Sweden. Another biblical MS. (*Codex Giganteus*) contains nearly all the Old Testament, much of the Apocrypha, all the New Testament, except the Pauline Epistles and the Apocalypse; the greater part of Josephus; and a strange treatise on magic, adorned with a gilded portrait of the arch-enemy. Here is also a most curious English medical MS., apparently of the fourteenth century, somewhat after the fashion of the *Regimen Sanitatis* of the famous School of Salerno. Appended to this part of the *Codex*, which is metrical, are various prescriptions and clinical memoranda, which have sometimes led to its description as a physician's case-book. There are other choice MSS., which cannot here find mention.¹⁰ Of the Upsal Library, there is a printed catalogue up to 1814,¹¹ since continued in MS. Of the MSS. given by Sparvenfeldt, a catalogue was printed in 1706.¹² Of the Oriental MSS., the first part of a catalogue, by Toruberg, was printed in 1849.¹³

XIV. TURKEY.

Oriental libraries are, usually, but small collections, the contents of which are little known to Europeans. Their general character, however, will be most satisfactorily indicated by the description of some of them.

At Constantinople there are, within the walls of the

¹ App. to the *Report on the British Museum*, p. 483.

² *Codices Orientales Bibliothecæ Regiæ Havniciæ*, &c. Hafn. 1846, 4to; *Description des Manuscrits François du Moyen Age de la Bibl. Roy. de Copenhague*, par Abrahams, Copen., 1844, 8vo; *Catalogus Bibliothecæ Thottianæ* [by Ebert and Ecard] Havniciæ, 1789-95, 12 vols. 8vo. Part of the splendid collection of Thott (who had amassed 121,945 printed volumes—6039 of which were printed anterior to 1530—and 4154 MSS.) was added to the Royal Library by bequest, and part by subsequent purchase. The catalogue is so good, that Brunet has said of it, if it be not one of the choicest, it is certainly one of the most useful books, which a bibliographer could put into his working collection. Of the Oriental MSS. of the University Library, a portion is described in Westergaard's catalogue, entitled, *Codices Indici Bibliothecæ Universitatis Havniciæ*.

³ *Foreign Office Returns* of 1851, p. 45.

⁴ *Ibid.*, p. 47.

⁵ *Ibid.*, p. 48.

⁶ *Ibid.*, p. 47.

⁷ *Notices sur les Bibliothèques Publiques en Suède*, Appendix to *Report*, ut supra, p. 497, et seqq.

⁸ *Foreign Office Returns* of 1851, p. 44.

⁹ *Ibid.*, p. 49.

¹⁰ *Comp. Travels of Dr E. D. Clarke*, vol. vi., pp. 279-283; Elliott, *Letters from the North of Europe*; Von Schubert, *Reise durch Schweden*, &c. (1817-20); Stephens, *Extracts from an old English Medical Manuscript at Stockholm* (*Archæologia*, 1844, vol. xxx., pp. 349-429).

¹¹ *Catalogus Librorum impressorum Bibliothecæ Regiæ Academicæ Upsaliensis*, 1814, fol.

¹² *Catalogus Centuriæ Librorum Manuscriptorum Rarissimorum*, &c., 1706. This catalogue was drawn up by Celsius and Benzelius.

¹³ *Codices Arabici, Persici, Turcici, Bibliothecæ Regiæ Acad. Upsaliensis*, Upsal, 1849.

Foreign
Libraries
of Constantinople.

Seraglio, two libraries, which were founded respectively by Achmed III. and Mustapha III., and enriched with books acquired by themselves or their successors. These libraries do not appear to contain more than 6000¹ volumes, and are seldom increased by purchase, but occasionally by donations made to the sultan by his grandees, or by confiscations of the effects of public officers, amongst which books are sometimes to be found.² Much uncertainty has prevailed, and many erroneous reports have been circulated, respecting the contents of these libraries. The Abbé Sevin, who arrived at Constantinople in December 1728, failed to obtain admission into the Sultan's Library; and, deterred by the assurances he had received, that Amurath IV. had caused all the Greek MSS. to be burned, he deemed any further research or inquiry to be hopeless; whilst succeeding travellers, relying on statements of a different kind, have—as we had occasion to notice in a preceding part of this article—confidently asserted that in these libraries were still preserved the ancient collections of the Greek emperors.³ More fortunate than his predecessors, however, Toderini, after three years' unremitting attempts during his residence at Constantinople, found means to procure transcripts of the catalogues of the libraries in the Seraglio, through the instrumentality of a page who clandestinely copied a few lines every day.⁴ From the inquiries of the learned Abbate, it appears that the merits of these collections had been greatly exaggerated. The libraries of the Seraglio are much inferior to some of those which are open to the public. Commentaries, explanations, marginal notes, and other writings on the *Koran*, form the subjects of the largest portion; to which succeed treatises on jurisprudence (also accompanied with notes and commentaries), on philosophy, logic, astronomy, arithmetic, medicine, and ethics. The historical works are few in number, and chiefly relate to the Ottoman empire. There are some MSS. in the Greek, Latin, and other European languages; but no traces whatever have been discovered of the lost decades of Livy, of the writings of Homer or Tacitus, or of those parts which are deficient in the works of other ancient authors.⁵

Besides those of the Seraglio, Constantinople possesses thirty-nine public libraries,⁶ all varying in extent, but more or less noticeable for the number and value of their manuscripts, which are neatly bound in red, green, or black morocco. The Mohammedans have a peculiar method of indorsing, placing, and preserving their books. Each volume, besides being bound in morocco, is preserved from dust in a case of the same material; and on it, as well as on the edges of the leaves, the title is written in legible characters. The books are placed one upon another in presses ornamented with trellis-work, and are disposed along the wall, or in the four corners of the library. To facilitate literary researches, each library is furnished with a catalogue, containing the title, and giving a short account of the subject of each volume. Theology, including the *Koran* and *Commentaries* thereon, jurisprudence, medicine, ethics, and history, are the sciences chiefly cultivated by the

Osmanlees. The books are usually written with the greatest care, on the finest vellum; the text of each page is inclosed in a highly-ornamented and gilt frame work; the beginning of each chapter or section is splendidly illuminated; and the prices of the manuscripts vary in proportion to the beauty of the characters.⁷ Under the reign of the late Sultan Mahmoud, the introduction of European discipline, and, to a certain extent, of European customs and manners, has paved the way for still more important innovations. Recent events must also greatly facilitate the introduction of European knowledge and civilization, and the ultimate subversion of those fanatical prejudices, which, when fostered by ignorance and matured by superstition, have ever presented the most formidable obstacle to the improvement of nations.

The Library of the Convent of Mount Sinai was found by Mr Burckhardt to contain a great number of Arabic manuscripts, and some Greek books; but the former proved to be of little literary value; and of the latter, Burckhardt carried away two beautiful Aldine editions, a Homer and an *Anthology*. The priests refused to show him their Arabic memorandum-books previous to the fifteenth century; but from those which he was permitted to inspect, he copied some very interesting documents concerning the former state of the country.⁸

Foreign
Libraries

(3.) AMERICAN AND COLONIAL LIBRARIES.

I. UNITED STATES OF AMERICA.

Scarcely any country in the world has made, within a period of ten years, such rapid strides in the provision and improvement of libraries, freely accessible, as have the United States, since the year 1847. Libraries, indeed, had been among the objects of early solicitude to the colonists; but the work that lay nearest their hand was too stern and too urgent to admit of much more being done in this direction than was plainly and immediately educational. Collegiate libraries were cared for from the first. School libraries grew up quietly as incidents of school organization. Men met together to form proprietary libraries of various kinds, as soon as the comparative completion in the older parts of the country of the rough pioneer work gave them a little breathing time, just before the outbreak of the revolutionary war. When that fierce strife came, libraries were not infrequently turned into barracks, or into military hospitals; nor can it be at all a matter of surprise that occasionally books found their way into knapsacks (usually of British manufacture), and suffered an eventual metamorphosis into grog.⁹ In more peaceful times the old libraries were sought for and furnished up. Accessions were made, and a systematic literary intercourse with Europe was established. Private libraries, too, were formed, with improving taste, and with a liberality according well with the great wealth of many of their owners. Two classes of libraries, however,—each of them the most important of all within its own sphere,—have sprung up only in recent

Libraries
of United
States.

¹ White, *Three Years in Constantinople*, 2d edit., 1846 (vol. ii., pp. 182–196). Mr White affirms distinctly that the librarian's own statement of the larger of these two Seraglio Libraries, made to himself in June 1842, was, that it contained but 4440 volumes. It had contained within his memory 6100, but the late sultan had removed some of them to another collection. D'Ohsson has stated that these Seraglio Libraries contained in his day 16,000 volumes. Recent writers have put them at 20,000. The returns sent by Lord Redcliffe to Lord Palmerston, in 1850, do not contain the precise number of volumes in any Turkish library, but say generally that the largest of them "do not contain more than about 4000 volumes." (*Foreign Office Returns* of 1851, p. 50.)

² D'Ohsson, *Tableau général de l'Empire Ottomane*, tom. ii., pp. 487–494.

³ It is not a little singular that Dr E. D. Clarke has made no mention whatever of the libraries of the Seraglio, although he has given a detailed, and, upon the whole, picturesque description of its interior.

⁴ *Catalogo della Libreria della Seraglio, trasportato da Constantinopoli a Venezia, dall' Abbate Giambattista Toderini, nel anno 1786*, in 8vo. See also *Della Letteratura Turchesca*, tom. ii., pp. 53–81.

⁵ Toderini, *Letteratura Turchesca*, tom. ii., pp. 51, 53, et seqq.

⁶ *Foreign Office Returns*, 1851, *ubi supra*; Comp. D'Ohsson, tom. ii., pp. 488, 489; Toderini, tom. ii., p. 32, et seqq.

⁷ *Foreign Office Returns*, 1851, p. 51.

⁸ Burckhardt, *Journals in the Peninsula of Sinai*, May, 1817.

⁹ MacMullen, *The Past, Present, and Future of the New York Society Library* (1856), p. 5.

American days. Of the first class, the Astor Library at New York may be considered a type; and of the second, the Free Public Library of the city of Boston. Our retrospect of the growth and progress of American libraries, from the foundation of that of Harvard College in 1638, to the establishment of the Boston Free Library in 1852, must be compressed into very narrow limits; but will be best arranged in the order indicated by their actual succession. We begin, therefore, with university or collegiate libraries.

Almost the entire progress made by Harvard Library between 1638 and 1764, was cancelled by the disastrous fire which occurred in the college buildings early in the last named year. By that accident, about 5000 books were destroyed, and some pleasant links which visibly connected the memories of many British worthies with the growing American university were sundered. Among the burned books were many that had been given by Kenelm Digby, by John Maynard, by Lightfoot, by Gale, and by Bishop Berkeley. Vigorous efforts were soon made to form a new library. The legislative bodies of other States, as well as that of Massachusetts, contributed. Friends in England, amongst whom Thomas Hollis was pre-eminent, gave zealous help. But the war interposed serious obstacles; and even in 1790, the collection did not muster more than 12,000 volumes. They were well chosen; and have now grown into a library, which (including its ancillary or special collections, such as those of Divinity and of Law) numbers at least 83,000 volumes, and is steadily increasing. There is a good printed catalogue,¹ and the library is freely accessible for literary purposes. The Library of Brown University, in Rhode Island, ranks next. Its first beginnings date from 1768.² It now contains about 30,000 volumes; exclusive of the students' libraries, which number nearly 12,000 more. Yale College Library is somewhat older than the college itself; it being recorded, that at the second of the preliminary meetings, in 1700, each of the ten founders brought with him some books, and placing them on the table, said,—“*I give these books for the founding of a college in this colony.*” But the real cornerstone of the library was laid by Bishop Berkeley thirty years later.³ He sent over the finest collection of books that had then been seen in America; and it is owing to his influence that Yale College can show in her Donation-Book the names of Burnet, Kennet, Bentley, Halley, Newton, and Steele. This collection has grown to somewhat more than 27,000 volumes; besides three subsidiary students' libraries, containing, in the aggregate, 33,000 volumes more. The Library of the University of Virginia dates but from 1825, and was selected and originally arranged by Jefferson. It now numbers upwards of 21,000 volumes. There are more than 100 other college libraries, most of which are yet in the cradle, but give good promise of growth. The aggregate number of volumes in all the libraries of this class is estimated to exceed 650,000; exclusively of the students' libraries, which amount, nominally, to nearly 300,000 volumes in addition; but collections of this kind must obviously require large deduction for wear and tear.

The most valuable of the proprietary libraries is also the oldest of them; “and was,” says Benjamin Franklin, “my first project of a public nature. I drew up the proposals,

... and procured subscribers.” This was in 1731. “We afterwards,” he continues, “obtained a charter [1742], the company being increased to one hundred; this was the mother of all the North American subscription libraries. It is become a great thing itself, and goes on increasing. These libraries have improved the general conversation of the Americans; have made the common tradesmen and farmers as intelligent as most gentlemen from other countries, and perhaps have contributed, in some degree, to the stand so generally made throughout the colonies in defence of their privileges.”⁴ James Logan, the friend and counsellor of William Penn, had formed a valuable collection of books, and had given them to trustees in Philadelphia for public use. Another collection formed in England by his brother served to augment the former; and, in 1792, an act of the Pennsylvania legislature conjoined the Loganian collection with the library founded by Franklin. It now, therefore, under the title of “Library of the Philadelphia Library Company,” combines the characters of a public and of a subscription library; as a reference collection, it is freely accessible; as a lending collection, subscribers only may borrow books. The United Libraries contained in April 1856, 64,195 volumes.⁵ There is a very good classified and printed catalogue, up to 1835 (2 vols. 8vo), which has won the merited commendation of Brunet. (“We consider,” he says, “this catalogue a good model for our own public libraries.”⁶) And we have before us some proof-sheets of a third volume, on the same plan, which contains all the added books up to April 1856. Next in rank comes the Library of the Boston Athenæum, a very choice assemblage of books, and better stocked with foreign scientific literature than are most American libraries, amounting in 1857 to more than 60,000 volumes; and enjoying the eminent distinction of possessing a portion of the library of Washington. The third place belongs to the Mercantile Library of New York, commenced in 1821, and which, under the vigorous management of Mr S. Hastings Grant, had grown, on the 1st August 1856, to 47,082 volumes;⁷ of this collection too, there is an excellent catalogue, or index, on the alphabetical plan. The Mercantile Libraries of Boston, Cincinnati, and St Louis are of subsequent date, and contained, respectively, in 1856, 18,000,⁸ 16,423,⁹ and 12,840 volumes.¹⁰ The library of the American Antiquarian Society at Worcester contains the curious collections of its founder, Dr Isaiah Thomas, the historian of American printing, and also those of the Mather family. It now amounts to nearly 21,000 volumes. The New York Society Library was founded about 1700, by the Rev. John Sharp, the English chaplain of Lord Bellamont, then governor of the colony, and was augmented by a small collection bequeathed by an English rector thirty years afterwards. It now contains upwards of 40,000 volumes of printed books, and a few MSS.¹¹

The earliest of the State libraries is that of New Hampshire, founded at Concord about 1770. It now contains little more than 7000 volumes. Ohio has a State library, founded in 1817, with between 15,000 and 16,000 volumes. That of New York, at Albany, is the largest and best selected of all the State libraries. It dates but from 1818, and was long an inconsiderable collection. The energetic administration of the late Dr J Romeyn Beck

¹ *Catalogue of the Library of Harvard University*, 1830, 8vo, with supplement.

² Jewett, *Notices of Public Libraries in the United States* (1851), p. 54.

³ Jewett, *Notices of Libraries in U. States*, p. 71. Mr Bancroft has said in his noble history, “Berkeley returned to Europe to endow a library in Rhode Island,” &c. (*History of the Colonization of the U. States*, vol. iii., p. 374); but this would seem to be a verbal oversight, although even such oversights are very unusual with that accomplished historian.

⁴ *Autobiography of Franklin*, by Sparks, p. 97.

⁵ *Catalogue of the Books of the Library Comp. of Philadelphia*, vol. iii., p. xiii.

⁶ *Manuel du Libraire*, 4^{me} edit., vol. i., p. 678.

⁷ *Thirty-fifth Annual Report of New York Mercantile Library* (1856), p. 17.

⁸ *Thirty-sixth Annual Report of the Mercantile Library of Boston* (1856), p. 34.

⁹ *Twenty-first Annual Report of the Mercantile Library of Cincinnati* (1856), p. 6.

¹⁰ *Ninth Annual Report of the Mercantile Library of St Louis* (1855), p. 12; *Tenth Report* (1856), p. 15. ¹¹ MacMullen, *ut supra*, p. 5.

American
Libraries.

raised it rapidly to an important position; and it now contains 43,634 volumes of printed books,¹ and some valuable MSS., chiefly relating to American history; amongst them many early colonial charters and other public documents; the papers of Sir William Johnson and of Governor Clinton, and a curious series of letters relating to the affair of Major André. The remaining State libraries, twenty-six in number, range from 3000 up to 17,000 volumes, and contain, in the aggregate, nearly 200,000 volumes. These are of course, in the main, not only political, but Americo-political in character; and are especially intended for the furtherance of public business.

Library of
Congress at
Washing-
ton.

The first Library of Congress was destroyed by the British army in 1815. The second library was founded on the basis of that of President Jefferson, and was partially destroyed by fire in 1851. At the time of this calamity it contained more than 50,000 volumes, but of these about 20,000 were saved,—including much of the Jefferson collection, which was strong in American history,—and became the nucleus of a third library. At the beginning of 1854, 20,000 volumes had been already acquired, chiefly by purchases, to meet which appropriations have been made by Congress, amounting to about L.17,000. Early attention was wisely given to the acquisition of,—(1.) The long sets of important periodicals; (2.) The great antiquarian and scientific works of the Champollions, Rosellinis, Kingsboroughs, and Humboldts; (3.) Valuable and rare works on American history. At present the collection, which is not yet definitively arranged, must number between 60,000 and 70,000 volumes.

Astor li-
brary at
New York

America cannot be said to have possessed any great library, formed with especial view to the wants of the higher classes of students, until the bequest of John Jacob Astor (of "four hundred thousand dollars, out of my residuary estate, to the establishment of a public library in the City of New York") laid a very substantial foundation for such an one, in the year 1839. The testator died nine years afterwards, and his trustees were incorporated in 1849.

Their first proceeding was to select a librarian,—indeed, one had already been virtually selected by Mr Astor's own foresight,—and to send him to Europe (with large powers and wide discretion) for the purchase of books. Dr Cogswell acquitted himself of his task in the manner in which it had been foreseen he would perform it. He is now at the head of a well-chosen library, gathered from the best markets of England, France, Italy, and Germany, already numbering between 95,000 and 98,000 volumes; and lodged in a handsome and fire-proof building—Florentine in style—which is capable of holding, perhaps, three times the number. A sum of 180,000 dollars (L.37,500) was originally invested as a maintenance fund, and has since been increased. Liberal donations in aid of the library have also been received from Mr W. B. Astor, son of the founder.² The library is open to all comers as a library of reference, and is open to nobody as a lending library, so that students are certified that all books which the library possesses will be found within its walls.

Smithson's
library at
Washing-
ton.

The Smithsonian Institution at Washington possesses a library of about 15,000 volumes, the majority of which have accrued either by gift or by exchange for its publications. Founded, as will be remembered, by the contingent bequest of James Smithson, an Englishman (. . . "In case of the death of my said nephew without . . . children, . . . I then

bequeath the whole of my property . . . to the United States of America, to found at Washington, under the name of the Smithsonian Institution, an Establishment for the increase and diffusion of knowledge amongst men"),³ it was incorporated in 1846, and its name and publications have already become familiar throughout Europe. When the contingency occurred, the money was put to interest, so that, at the date of the charter, the fund amounted to nearly L.160,000. Great diversity of opinion prevailed as to the character of the appropriation which would best carry out the testator's purpose, and most redound to the honour of the United States. Eventually it was determined that the plan should include,—(1.) publications, especially such as should add to science; and, also, (2.) a library and museum. But hitherto the first part of the plan has been an Aaron's rod to the second part.

American
Libraries.

The first of those Free City Libraries, which bid fair to be worked out in the United States with true American energy and thoroughness, was that of Boston, organized in 1852 by the city government (by an ordinance of the 14th Oct.), but substantially founded on 5th August 1850, by Mr John P. Bigelow, Mayor of Boston, who then diverted a subscription of 1000 dollars, intended to be expended on some mark of the respect of his fellow citizens for himself, towards "the establishment of a Free Library;" and who had already received a present of French books, through the agency of M. A. Vattemare; and presents of American books from Edward Everett, and from Robert Winthrop, a descendant of the founder of the Commonwealth of Massachusetts.

Free City
libraries.

To this beginning Mr Joshua Bates brought a first contribution of 50,000 dollars (L.10,416), and a second contribution of an extensive series of books, purchased in Europe expressly for the library. Mr Jonathan Phillips gave 10,000 dollars (L.2083) to be invested as a book fund; Mr Abbott Lawrence, an active promoter of the enterprise, bequeathed a like sum at his lamented decease. This remarkable liberality was worthily met by the city authorities. The library was opened for public use in 1853, and now contains about 25,000 volumes. On its committee appear the names of Everett, Ticknor, and Story, in whose report it is described as "intended to furnish . . . the opportunity of completing that education of which the foundations have been laid in the public schools."⁴

The small town of New Bedford quickly followed the example of Boston. Its library is now in the fourth year of its existence, and has nearly 10,000 volumes. In the *Fourth Annual Report*, the trustees thus express themselves,—“A Free Public Library is the crowning glory of the system of public education, which has been, from our earliest history, the pride of Massachusetts. . . . No act of the municipal authorities has ever met so universally and deeply the approbation of the people.”⁵

The most noticeable libraries of the British colonies in America are those at Quebec and Montreal. Both are still small, but are progressive; and the legislature of Lower Canada has recently taken steps for their improvement and extension. In Upper Canada there is nothing which deserves to be called a public library. Even the collection which belongs to the legislature of that province is utterly neglected. “For nearly twelve years,” says Mr Mackenzie, “in several sessions of the provincial legislature, I made

Colonial
libraries.

¹ *Catalogue of the State Library of New York* (1857), preface; Comp. Jewett, *Notices of Public Libraries in the United States* (1850), pp. 73-78; and *Annual Reports of the Trustees of the State Library of New York* (1851-1856), 8vo.

² *Reports of the Trustees of the Astor Library, 1854-1856* (Albany), 8vo.

³ *Representative Documents of the Congress of the United States* (33d Congress, 2d Session), Report, No. 141, p. 5.

⁴ *Boston City Documents*, 1853, No. 73; 1855, No. 57, pp. 7-10; *Proceedings on occasion of laying the Corner-Stone of the Public Library of the City of Boston*, 17th September 1855, pp. 40-64.

⁵ *Fourth Annual Report of the Public Library of New Bedford* (March 1856), p. 12.

American Libraries. repeated efforts to improve the library, . . . but the council refused."¹

II. BRAZIL AND MEXICO.

Libraries of Brazil,

and of Mexico.

In the Brazils the most important collection is that in the "National Public Library" of Rio de Janeiro, said to amount to 70,000 printed volumes, and 851 MSS. When John VI. carried to Brazil the Royal Library of the Ajuda, it included 4000 MSS., but these went back to Portugal on the declaration of independence. Mexico has three libraries in its capital (1. *Cathedral*; 2. *University*; 3. *Gregorian*), with about 12,500, 10,000, 7000 printed volumes; and 500, 600, 200 MSS. respectively; and also a public library at Puebla, founded by Bishop Palafox, with about 25,000 printed volumes.

III. INDIA.

Indian Libraries.

Of the libraries in India, whether composed of European or of native works, the want of information sufficiently to be relied on prevents us from attempting to give many details. The following account of the largest library at Goa, that of the Augustinian monks, extracted from the Diary of Sir James Mackintosh, is now of bygone years, but is curious enough to be worth quoting. It was certainly by no means a flattering description. "The books," he says, "are about 10,000; chiefly Latin and Portuguese, with a few Spanish, a very few Italian and Greek, no French, and of course no English, and none of any other language. There are not above twenty printed after the close of the seventeenth century. There are a few bad editions of classics, but not a complete edition even of Cicero himself: a great many schoolmen, casuists, and canonists, with some jurists: very little history, scarcely any of modern times, except a little Portuguese; about ten volumes of Portuguese and Spanish poetry; no morals, but as the handmaid or rather slave of superstition; no politics, no political economy, . . . no astronomy, no chemistry, no zoology, no botany, no mineralogy, and no book even on mathematics, but Euclid. I did not know before that the world had produced 10,000 such useless and pernicious books, or that it had been possible to have formed a large library, with so curious an exclusion of whatever is instructive or elegant."² At the different presidencies, and in some other parts of British India, collections, more or less extensive and valuable, are in course of formation; but they have not been particularly described. Of the native libraries of India we know as little. That of Tippoo Sahib, which fell into the hands of the British when his capital was taken, consisted of nearly 2000 volumes, many of them highly ornamented. *A Descriptive Catalogue of the Oriental Library of the late Tippoo Sultan of Mysore*, by Charles Stewart, was printed at the University press, Cambridge, 1809, 4to. With the exception of some select manuscripts presented by the East India Company to public libraries in Great Britain, these Mysore MSS. were deposited by the Marquess Wellesley in the College of Fort William, then newly established. There has recently appeared an elaborate *Catalogue of the Arabic, Persian, and Hindustani Manuscripts of the Libraries of the King of Oudh*, by Dr Sprenger, printed at Calcutta, 1854, 8vo. In the preface to this work, after having described the value of the collection, and the neglect into which it had fallen, Dr Sprenger remarks that, unless the travelling Orientalist who may hereafter visit the collection, should chance to be a zoologist as well, it will be prudent for him to poke with a

stick into the boxes in which the books are kept, before putting his hand into them. He illustrates the other departments of library economy, as practised at Lucknow, by observing that the "King's people" have long been accustomed to count the volumes periodically, but without any regard to their contents or character. So that the numbers do not diminish, the superintendents take no note of any changes in the books. "I have heard," he adds, "that a late librarian sold in one week 1100 rupees worth of books to provide funds for the marriage of his daughter."³ At Calcutta there is a good public library,—freely accessible for consulting purposes,—which contained in 1848, upwards of 20,000 volumes, and now contains probably 25,000.⁴

Indian Libraries.

The subjoined statistical table gives a comparative view of the numerical contents of the several libraries which have been referred to in the course of this article, those of private persons only excepted, and suggests a remark or two, with which our historical survey may fitly close. Had such a table been appended to the article "LIBRARIES" in the last edition of this work, the comparative place in it of Great Britain would have been far less creditable than it now is. In point of magnitude, our national library would have figured as tenth instead of second in the scale. In point of accessibility, almost every considerable library in this empire would have shown disadvantageously when compared with many libraries in France, with some in Italy, with nearly all in Germany. In respect to the number of libraries, of importance enough to subserve systematic study and research, our position would have been in direct contrast to the wealth, the extent, the quiet, the freedom, and the literary glory of Britain. If, indeed, our table had been so stretched as to include *private* collections, the list would have worn a different aspect, but (with a small number of honourable exceptions) its additional entries would no more have presented means of gratification to the mental appetites of the scholar, than the extension of his sumptuous bill of fare would have charmed the palate of the immortal Governor of Barataria, whilst he was under the wand of Dr Rezio de Agüero. As it now stands, in 1857, the number, extent, and accessibility of British libraries show a large measure of progress, but a measure which should rather be stimulating than satisfactory.

The main *desiderata* in this respect, as the matter shapes itself to us, seem to be,—(1.) Such a revision of the regulations of existing libraries, and, above all, of those of libraries which in some form or other derive national aid,—either directly from the public purse, or indirectly by contributions levied on authors and publishers,—as shall ensure the largest amount of public service consistent with safety and good order. (2.) The preparation and printing of thorough catalogues of the principal libraries of the country, on as uniform a plan as may be found practicable; and the making of such catalogues accessible to all students. (3.) The removal of all fiscal obstructions to the production of English books, and to the importation of foreign books, whatever the apparent magnitude, the supposed incidence, or the plausible pretexts of such obstructions. (4.) Such measures, with respect to the circulation and diffusion of all books, maps, state-papers, and public documents of every kind, which are printed at the national expense, as shall both ensure their presence in all libraries where they are likely to be of public utility, and transform what has too often been a matter of petty intrigues and miserable jealousies into a potent means for the encouragement of science and litera-

Statistical table of libraries.

¹ Mackenzie, *Sketches of Canada*, p. 383; Comp. Preston, *Three Years' Residence in Canada*, vol. ii., p. 246.

² *Life of the Right Hon. Sir James Mackintosh*, vol. ii., p. 85. London, 1836, 8vo, 2d edition.

³ Sprenger, *Cat. of the . . . MSS. of the King of Oudh*, pref., p. 5 (Calcutta, 1854, 8vo).

⁴ *Circular of the Curators of the Calcutta Public Library*, sent to Europe in 1849; Comp. *Report, &c.*, p. 1847-8 (Calcutta, 1848, 8vo), p. 5.

Concluding remarks. (5.) Thorough inquiry into the existence, the condition, and the means of vivifying such old libraries, founded for public use, as may have fallen into more or less of desuetude or neglect. And, (6.) Such further amendment of the "Public Libraries Acts" as the results of practical experience may commend to legislative consideration, with a view to their increased efficiency, where action under them shall already have taken place; to their greater adaptability to the varying circumstances of different localities; and to the removal of obstacles which may have impeded their extended adoption.

The measures here roughly suggested, will need time, patience, and industry for their thorough elaboration. One means of setting to work in this direction is close at hand; underlies to some extent every measure which has been indicated; and enwraps within itself an amount of latent power, the full force of which is incalculable. That means

is PUBLICITY. If every library in the country, on which the public has any fair claim, could be brought under public view by a clear and regularly recurring statement of (1.) what it *is*; (2.) what it *has*; and (3.) what it *does*; a long train of improvements would come into quiet and irreversible operation. But this is an instrument which, if it is to produce national results, must be nationally handled. It is *not* a matter for any private society or institution, howsoever patronized. If it were taken up (for example) even by a society, as useful in its proper sphere as has been the "Society for the Encouragement of Arts, Manufactures, and Commerce," it will assuredly fail. If it be taken up, on the other hand, by a public department, such as the "Committee of Council for Education," or, still better, by an individual Minister, possessing due authority and definite responsibility, it will as inevitably tend to make the libraries of Britain, in course of time, the foremost in the world. (E. E.)

STATISTICAL VIEW OF THE PRINCIPAL LIBRARIES ENUMERATED IN THIS ARTICLE.

GREAT BRITAIN AND IRELAND.	Name of Library and Date of Foundation.	Conditions of Public Accessibility.	No., or Estimated No. of Vols.		GREAT BRITAIN AND IRELAND.	Name of Library and Date of Foundation.	Conditions of Public Accessibility.	No., or Estimated No. of Vols.	
			Printed.	MSS.				Printed.	MSS.
Aberdeen...	{*University (or King's Coll.) 1634	By favour.....	37,000	74	Manchester and Salford	{†Free Public, 1852. ...	Open to all comers	32,573	...
	Marischal College.....	Free.	12,000	100		Chetham's, 1653.	Do.	18,200	137
Bolton	†Free Public, 1853.....	Open to all comers	15,000	...		†Salford Borough, 1850	Do.	18,553	...
Bristol.....	City. (Founded for public use, but now in the hands of a private society.) ...	.....	...	...	Norwich ...	Cathedral.	By permission...	4,350	...
	{*University, 1475. ...	By favour.....	197,000	3,163		City. (Founded for public use, but now in the hands of a private society.)	.....	...	...
	Trinity College.	By special perm.	43,000	...		*Bodleian, 1597.....	By special perm.	256,000	22,000
	St John's Coll., 1530.	Do.	26,000	...		Radcliffe, 1737.....	Freely granted...	24,000?	...
	Queen's College.	Do.	25,000	...		Taylor Institn., 1847....	Members of Univ.	10,000	...
	Gonville & Caius Coll.	Do.	14,000	700		Ashmolean Museum..	Do. ....	...	...
Cambridge	Emmanuel College....	Do.	17,000	...			Respecting the majority of the Oxford Libraries, H.M. Com. failed to obtain accurate information, either as to extent or accessibility; although they made repeated efforts..		
	Pepysian (Magd. College), 1703.	Do. ....	...	...	Oxford.....	Queen's College.....			
	Pembroke College.....	Do.	10,000	...		Christ Church Coll.			
	Peterhouse.....	Do.	6,300	...		All Souls' College. ..			
	King's College, 1577(?)	Do. ....	...	...		St. John's College....	...	3237	
Canterbury	Cathedral.....	Occasionally.....	5,000	...		University College.			
Carlisle. ...	Do.	Open to the Public	3,174	...		Merton College.....			
	*Trinity College, 1602.	By free ticket.	126,000	1,600		Balliol College.....			
	*King's Inns, 1787.....	Inaccessible	30,938	150		Worcester College.			
Dublin.....	*Dublin Society, 1731.	Free to consult....	24,000	...	St Andrews	University, c. 1600.....	By perm., freely...	61,500	63
	Archb. Marsh's, 1697.	Do.	18,000	193	Winchester.	Cathedral.....	Open to clergy....	3,500	...
	*Irish Academy, 1787.	Do.	10,000	500	Worcester.	Do.	Access on applic.	3,600	...
Durham ...	Cathedral.....	Open to the Public	11,000	520	York.	Do.	Free access	8,000	...
	*Advocates', 1680.	Do.	172,000	2,000					
	*University, 1580.....	Do.	100,000	400					
Edinburgh	Signet.....	Do.	45,000	...	FRANCE.				
	Medical Society, 1737.	For members.	16,000	...	Aix.....	Mejanes, 1418.....	Free access	95,000	1,062
	Physicians, 1682.....	Do.	9,000	...	Amiens.....	Communal, 1791.....	Do.	53,000	600
Ely	Cathedral.....	By special perm.	4,000	...	Arras.....	Town	Do.	36,772	1,137
Exeter.....	Do.	Do. (freely)	5,000	...	Avignon....	Do.	Do.	60,000	1,207
	*University, 1473.	Do.	75,000	242	Beaune. ...	Do.	Do.	30,000	160
Glasgow...	Stirling's, 1791.....	Free access.....	13,000?	...	Besançon..	Do.	Do.	80,000	1,500
	Hunterian Museum, }	Do.	12,500?	...	Bordeaux...	Do. 1738.....	Do.	123,000	320
	1781.....								
Lincoln ...	Cathedral.....	Open to clergy....	4,500	...	Caen.	Do.	Do.	40,107	226
Liverpool..	†Free Public, 1852.....	Open to all comers	34,274	...	Caubray.	Communal, 1791.	Do.	33,133	1,254
	*British Museum, 1753	By free ticket.....	562,000	10,000	Chau mont	Town	Do.	35,000	180
	London Institn., 1805	For members.....	60,000	...	Colmar ...	Do.	Do.	34,859	481
	London Subscrip. 1841	Do.	65,000	...	Dijon.....	Do.	Do.	50,000	500
	Royal Society, 1667....	By special perm.	41,000	...	Douay.....	Do. 1767.....	Do.	36,000	970
	*Sion College, 1631....	By free ticket.	41,000	...	Grenoble...	Do. 1771.....	Do.	80,000	1,500
	Lincoln's Inn, 1622....	By special perm.	28,000	900	Le Mans...	Do.	Do.	40,000	700
	Royal Institn., 1803....	For members.....	27,000	...	Marseilles	Do.	Do.	51,219	1,335
	Lambeth Palace, 1610.	By special perm.	25,000	1,200	Montpel- }	Do.	Do.	30,000	68
	Middle Temple, 1641.	Do.	21,000	...	hier ... }	Do.	Do.	22,000?	...
	Dr D. Williams', 1716.	Open to all comers	21,000	200	Nancy.....	Town, 1751.	Do.	30,000	265
	Inner Temple, 1707....	By special perm.	16,000	500	Nantes. ...	Do. 1588.....	Do.	45,000	187
	St Paul's Cath., 1713.	Inaccessible.....	8,000	...	Nismes. ...	Do.	Do.	50,000	207
		To inhabitants of Westminster by right, to others by courtesy.....	...	...	Orleans ...	Do.	Do.	33,000	486
	Archb. Tenison's, 1684.		3,000	...		Imperial, 1350 (?) re-organized, 1595....	Do. since 1737	815,000	84,000
		Fnd. for public use, but inaccessible.)	...	...	Paris.	Arsenal, 1781.....	Do.	202,000	6,000
	Westminst. Abbey, 1620.		11,000	...		St Genevieve, 1624.	Do. since 1790	180,000	3,500
						Mazarine, 1660.....	Do. since 1688	132,000	3,000
						Institute, 1759.	By permission ...	80,000	...

* The Libraries thus marked (*) are supported (wholly or partially) by parliamentary grant, or by copy-tax.

† The Libraries thus marked (†) are supported by rate.

LIBRARIES.

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STATISTICAL VIEW OF THE PRINCIPAL LIBRARIES, &c.—Continued.

Libraries.
Statistical
View.

Libraries.
Statistical
View.

	Name of Library and Date of Foundation.	Conditions of Public Accessibility.	No., or Estimated No. of Vols.			Name of Library and Date of Foundation.	Conditions of Public Accessibility.	No., or Estimated No. of Vols.	
			Printed.	MSS.				Printed.	MSS.
FRANCE.					ITALY.				
Paris	{ Louvre.....	By permission.....	80,000?	...	Vercelli	Chapter, or Agnesian..	.....	12,000	...
	{ Luxembourg.....	Free access	40,000	...	Verona.....	Town, 1802.....	.....	10,000	...
	{ Town, 1801 ?	Do.....	55,000	1,000	Vicenza.....	Bertoliani, 1755?	Free access	36,000	200
Rennes. ...	Town.....	Do.....	40,000	220	GERMANY AND SWITZERLAND.				
Rheims. ...	Do.....	Do.....	30,000	1,300	Aarau	Cantonal, 1803.....	Do.....	60,000	1,200
Rouen.....	Do.....	Do.....	110,000	2,355	Augsburg ..	{ Provincial and.....	Open to edu-	118,000	394
Soissons...	Do, 1794.....	Do.....	30,000	293		{ Town, 1537.....	cated pers. ...	70,000?	2,800
Strasbourg	Do, 1531.....	Do.....	180,000	1,589	Bamberg...	Royal Public, 1611	Do.....	78,000	4,000?
Toulouse...	Do.....	Do.....	50,000	700	Basel.....	University, 1530 (?).....	Free access	500,000?	10,000
Troyes.....	Do.....	Do.....	100,000	3,000		{ Royal Public, 1661	{ Open to edu-	40,000	...
Versailles..	Do.....	Do.....	55,924	115	Berlin	{ University, 1830	{ For profs. and	164,000?	450
SPAIN AND PORTUGAL.					Berne	Town, 1548.....	Free access	49,500	2,303
Coimbra.....	University, 1597.....	Open to Public...	52,000	900	Bonn.....	University, 1818	Do.....	350,000	2,000
Corunna....	Santiago University...	Do.....	17,307	41	Breslau.....	{ Royal and Univer-	Do.....	25,000?	800
Escorial....	Royal, 1575.....	By special perm.	40,000?	4,500?		{ sity, 1811.....	Do.....	15,000?	...
Evora.....	Town, 1805.....	Free access	25,000	1,800	Cassel	{ Ducal, 1580 (?) org. 1760	Do.....	60,000?	1,400
	{ National, 1796.....	Do.....	86,000	8,075	Darmstadt..	Ducal, 1760.....	Do.....	197,000?	4,000
	{ Academy of Sciences }	Do.....	50,000	10,000		{ Royal Public, 1555	Do.....	305,000	2,800
	{ 1779.....	Do.....	200,000	2,500	Dresden.....	{ Secundogenitur, 1750(?)	By permission...	30,300	300
Madrid. ...	National, 1712 (?).....	Do.....	48,000	1,222	Erfurt	{ Royal, 1716 (reorga-	Do.....	31,300	1,178
Oporto.....	Royal Public, 1833	Do.....	24,000?	1,500		{ nised 1816).....	{ Open to edu-	135,000	1,500
Salamanca..	University, 1215 (?) ..	Do.....	18,000?	700?	Erlangen...	University, 1743	{ cated pers. }	39,200	800
Seville. ...	Columbian, 1560.....	Do.....	30,000	125	Frankfort..	University.....	Do.....	47,000	200
Toledo.....	{ Town or Cathedral(?)	Do.....	13,250	...	Geneva.....	Town, 1564.....	Free access	92,000	1,274
Valladolid..	{ 1598.....	Do.....	105,000	6,000	Giessen.....	University, 1607.....	Do.....	150,000	5,000
	{ Town (?).....	Do.....	83,000	...	Gotha.....	Ducal Public, 1640	Do.....	360,000	3,000
ITALY.					Gottingen..	University, 1736	{ Chiefyalend-	59,000	636
Bologna ...	{ University, 1690.....	Do.....	80,000	900	Greifswald.	University, 1604	{ ing library }	100,000?	934
	{ Magnani.....	Do.....	1,316	6,952	Halle	University, 1696	Free access	200,000?	5,000
Catania....	Town.....	Do.....	40,000	...		{ Town, 1529.....	Do.....	40,000	...
Ferrara....	{ Do, 1646.....	Do.....	80,000	900	Hamburgh ..	{ Commercial, 1735	By permission...	6,000	...
	{ Laurentian, 1444.....	Do.....	140,000	10,000		{ Society of Arts and	Free access	105,000	...
	{ Magliabechian, 1714.....	Do.....	80,000	1,500	Hanover.....	{ Manufactures, 1765,	Do.....	150,000?	3,000
	{ Palatine.....	By perm. freely.....	33,435	1,375	Heidelberg ..	{ (restored 1843).....	Do.....	90,000?	...
	{ Marcellian, 1753.....	Free access.....	20,000	3,600	Jena.....	Royal, 1690.....	Do.....	75,000	...
	{ Riccardian, 1612.....	Do.....	11,000	...	Königsberg...	University, 1703	Do.....	45,000	300
	{ Library of the Fine Arts	Do.....	39,200	800	Lausanne....	Do, 1548.....	Do.....	120,000	2,500
	{ University, 1770 (?).....	Do.....	60,000	...		Do, 1544.....	Do.....	81,000?	1,034
	{ Berian, 1791.....	Do.....	12,000	68	Leipsic.....	Town.....	Do.....	480,000?	22,000
	{ Franzonian, 1773	Do.....	40,000	400	Mentz.....	University, 1543.....	Do.....	220,000?	2,000?
	{ Library of Missions	By permission }	12,000	...	Munich	{ Royal Central, 1660 ?.	Do.....	41,000	320
	{ of St Charles, 1727	Open to the pub.	40,000	400		{ University, 1575 (at	Do.....	50,000	800
Macerata...	Comm. or Mozian, 1787	Free access	80,000?	5,500	Nuremberg ..	{ Ingoldstadt)	Acceabl. once }	10,000?	...
Mantua....	Public.....	Do.....	125,000	1,000	Saint Gall..	Cantonal, 830(?).....	Free to citizens..	245,000	3,230
Messina...	Town.....	Do.....	18,000?	800		Royal, 1765.....	Free access	90,000	2,120
Milan.....	{ Ambrosian, 1604.....	Do.....	200,000	4,000	Stuttgart...	Town, 1773.....	Do.....	200,000	2,000
	{ Brera, 1763.....	Do.....	70,000	1,000	Tubingen....	University.....	Do.....	365,000	20,000
Monte Cassino }	Benedictine Monastery	By permission...	20,000	60	Vienna.....	University, 1777	Do.....	120,609	...
	{ Royal Bourbon, 1780(?)	Nominally free...	79,000	1,672		{ Military Archives,	Special permis-	22,500	...
	{ Brancaccian, 1688.....	Do.....	40,000	...	Wolfen- bützel. }	{ 1801.....	Free access	190,000	4,000
	{ University.....	Do.....	30,000	...		Ducal, 1604.....	{ Accessible }	62,000	3,500
	{ Oratorian.....	Do.....	62,500	...	Zurich.....	{ Town, 1639	{ twice a week }	27,000	...
	{ Chapter.....	On application...	40,000	700		{ Cantonal, 1835.....	{ For use of can-	...	...
	{ University, 1629.....	Free access	23,500?	448	BELGIUM AND HOLLAND.				
	{ Univ. or Communal	By permission...	100,000	25,000	Amster- dam. }	Town	Uncertain.....	31,500?	88
	{ Jesuits.....	Do.....	70,564	...		Town, 1476.....	Free access.....	22,000	29
	{ University, com. 1500,	Free access	30,000	...	Antwerp...	Do, 1798.....	Do.....	12,000	550
	{ reorganized, 1772	Do.....	62,500	...		{ Royal (Burgundian)	Do.....	203,000	19,668
	{ Town.....	Do.....	40,000	700	Bruges.....	{ c. (1400), 1837.....	Do.....	...	...
	{ Pisa.....	Do.....	23,500?	448		{ Archives.....	{ Sep. arts & doc'ts.	130,394	...
	{ Ravenna.....	Special permis...	100,000	25,000					
	{ Rimini.....	Free access	200,000	...					
	{ Vatican, 1450.....	{ At present in- accessible... }	35,000	7,000					
	{ Casanata, or Min- erva, 1700.....	Free access	84,819	2,945					
	{ Barberini.....	Do.....	80,000	3,000					
	{ Angelica, 1604.....	Do.....	35,000?	...					
	{ Alexandrine or 'Sa- pienza,' 1660.....	Do.....	60,000	3,000					
	{ Lancisiana, 1720	By permission...	40,000?	...					
	{ Corsini.....	Do.....	70,000?	...					
	{ Aracelitana.....	{ At present in- accessible... }	...	...			
	{ Roman College.....	By permission ..	...	...			
	{ Chigi.....	Free access	35,000	8,417					
	{ Vallicelliana or Ora- torian.....	Do.....	121,000	3,000					
	{ Sienna.....	Do.....	103,859	10,000?					
	{ Turin.....	Do.....	...	...			
	{ Venice.....	Do.....	...	...			

STATISTICAL VIEW OF THE PRINCIPAL LIBRARIES, &c.—Continued.

Libraries.

Libraries.

Statistical
View.Statistical
View.

	Name of Library and Date of Foundation.	Conditions of Public Accessibility.	No., or Esti- mated No. of Vols.			Name of Library and Date of Foundation.	Conditions of Public Accessibility.	No., or Esti- mated No. of Vols.	
			Printed.	MSS				Printed.	MSS.
BELGIUM AND HOLLAND.					TURKEY. 				

NUMERICAL RANK OF SO MANY OF THE PRECEDING LIBRARIES AS CONTAIN 150,000 VOLUMES, OR UPWARDS.

CITIES.	Name of Library and Date of Foundation.	Printed Vols.	MS. Vols.	Total No. of Vols.	CITIES.	Name of Library and Date of Foundation.	Printed Vols.	MS. Vols.	Total No. of Vols.
1. PARIS (1.)	Imperial, originated 1350; reorganised 1595.....	815,000	84,000	899,000	13. BRUSSELS.....	{ Royal, orig. 1389? ; reorganised, 1830 }	203,000	19,700	222,700
2. LONDON.....	British Museum, 1753	562,000	40,000	602,000	14. MUNICH (2.) ...	University, 1575.....	220,000	2,000	222,000
3. ST PETERSBURGH	Imperial Public, 1795	519,500	21,000	540,500	15. PARIS (2.).....	Arsenal, 1781.....	202,000	6,000	208,000
4. BERLIN.....	Royal, 1661.....	500,000	10,000	510,000	16. HAMBURGH.....	City, 1529.....	200,000	5,000	205,000
5. MUNICH (1.)	Royal, 1550 (?).....	480,000?	22,000	502,000?	17. NAPLES.....	Royal Bourbon, 1780.	200,000	4,000	204,000
6. COPENHAGEN.....	{ Royal, 1550; re- organised, 1665 }	408,000	15,000	423,000	18. MADRID.....	National, 1712 (?).....	200,000	2,800	202,800
7. VIENNA.....	Imperial, 1440.....	365,000	20,000	385,000	19. TUBINGEN.....	University, 1562.....	200,000	2,000	202,000
8. BRESLAU.....	{ Royal and Univer- sity, 1811..... }	350,000	2,300	352,300	20. CAMBRIDGE.....	University, 1475 (?).....	197,000	3,163	200,163
9. GÖTTINGEN.....	University, 1736.....	360,000	3,000	363,000	21. ROME.....	Cassanata, 1700.....	200,000?	..	200,000
10. DRESDEN.....	Royal Public, 1555.....	305,000	2,800	307,800	22. PESTH.....	National, 1802.....	185,000	10,000	195,000
11. OXFORD.....	Bodleian, 1597.....	256,000	22,000	278,000	23. WOLFFENBUTTEL.	Ducal, 1604.....	190,000	4,000	194,000
12. STUTTGART.....	Royal, 1765.....	245,000	3,230	248,230	24. PARIS (3.).....	St Geneviève, 1624..	180,000	3,500	183,500
					25. STRASBURGH.....	University, 1531.....	180,000	1,589	181,589
					26. EDINBURGH.....	Advocates', 1682.....	172,000	2,000	174,000
					27. HEIDELBERG.....	University, 1703.....	150,000	3,000	153,000

Liburni
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License.

LIBURNI, an ancient people, conjectured by Niebuhr to be of Pelasgic race, who inhabited the northern portion of Illyricum, in the neighbourhood of the Sinus Flanaticus. The country of Liburnia proper was bounded on the one side by the Titius, and on the other by the Arsia; but these limits were only assigned to it after the Gallic invasion, and by no means represent the real strength of the Liburnian people. From a very remote period they had been distinguished as daring seamen, and had spread extensively along the shores of the Adriatic. Corcyra, Issa, and other islands in the neighbourhood, were held by them at the time when the Greeks became masters of these places. The Vindelici and Veneti are believed to have been of Liburnian origin, and the city of Truentum, on the E. coast of Italy, was a Liburnian town. It remained true to the traditions and nationality of the race amid all the fluctuations of the surrounding population. Like all their neighbours, the Liburnians were noted pirates, and their privateers, with a large lateen sail, were for centuries the terror of the seas. Their style of naval architecture was adopted by the Romans in the second Macedonian war. It was chiefly by means of their light galleys that Augustus gained the battle of Actium. The only towns of any importance in Liburnia were Jadera, the capital, and Scardona, at which a famous congress of fourteen Liburnian towns was held. When the country was incorporated with the province of Dalmatia, Jadera was made a colony by the Romans.

LIBYA. See **AFRICA**.

LICENSE, of *Excise*, is a legal document granting permission to deal in certain specified articles of trade. A license is granted annually on application and on payment of the duty, except in cases where an abuse of privilege has been proven. Public-house licenses were granted in England as early as Edward VI. (1551); since which period this mode of imposing duty on excisable articles has been carried into several departments of trade. The annual revenue from licenses now exceeds L.1,000,000.

The following (from *The Business Man's Note-Book* for 1857) is a list of the trades which cannot be carried on in Great Britain without a license, specifying also the rate of license per annum:—

Auctioneers	L.10	0	0
Brewers of table-beer only—			
Not above 20 barrels	0	10	6
... 50	1	1	0
... 100	1	11	6
Above 100	2	2	0
Brewers of strong beer—			
Not above 20 barrels	0	10	6
... 50	1	1	0
... 100	1	11	6
... 1,000	2	2	0
... 2,000	3	3	0
... 5,000	7	17	6
... 7,500	11	16	3
... 10,000	15	15	0
... 20,000	31	10	0
... 30,000	47	5	0
... 40,000	63	0	0
Above 40,000	78	15	0
Brewers using sugar	1	0	0
Brewers for sale by retail, not to be consumed on the premises	5	10	3
Sellers of beer only, not being brewers	3	6	1½
Beer retailers (publicans) whose premises are rated under L.20 per annum (England and Ireland only)	1	2	0½
At L.20, or upwards	3	6	1½
Retailers of beer, cider, and perry, under 4th and 5th Will. IV., cap. 85, to be drunk on the premises (England only)	3	6	1½
Not to be drunk on the premises	1	2	0½
Retailers of cider and perry only	1	2	0½
Retailers of beer, cider, or perry, whose premises are rated under L.10 per annum (Scotland only)	2	10	0
At L.10 per annum, or upwards	4	4	0
Dealers in coffee, tea, cocoa-nuts, chocolate, or pepper	0	11	6½

Maltsters making not above 50 quarters	L.0	7	10½	License.
... 100	0	15	9	
... 150	1	3	7½	
... 200	1	11	6	
... 250	1	19	4½	
... 300	2	7	3	
... 350	2	15	1½	
... 400	3	3	0	
... 450	3	10	10½	
... 500	3	18	9	
... 550	4	6	7½	
Above 550	4	14	6	
Beginners (and a surcharge)	0	7	10½	
Not above 5 quarters	0	2	7½	
Malt roasters	20	0	0	
Dealers in roasted malt	10	0	0	
Paper—every maker of paper or pasteboard	4	4	0	
Passage vessels on board which liquors or tobacco are sold	1	1	0	
Postmasters' (Great Britain) licenses to let horses for hire—				
Persons keeping 1 horse and 1 carriage	7	10	0	
... 2 ... 2	12	10	0	
... 4 ... 3	20	0	0	
... 8 ... 6	30	0	0	
... 12 ... 9	40	0	0	
... 16 ... 12	50	0	0	
... 20 ... 15	60	0	0	
Above 15	70	0	0	
Above 20 horses, then for every additional 10 horses, or less than 10, over 20, or any other multiple of 10 horses, the additional duty of	10	0	0	
Postmasters (Ireland)	2	2	0	
and 1s. in the L.1 thereon.				
To kill game (Ireland)	3	3	0	
Race-horse duty	3	17	0	
Soap, every maker	4	4	0	
Spirits, Distillers	10	10	0	
Rectifiers	10	10	0	
Dealers, not retailers	10	10	0	
Spirit-dealers for retailing foreign liqueurs	2	2	0	
Makers of methylated spirits	10	10	0	
Makers of stills (Scotland and Ireland)	0	10	6	
Chemist, or any other person requiring the use of a still (England)	0	10	0	
... (Scotland and Ireland)	0	10	6	
Retailers of spirits whose premises are rated under L.10 per annum (England and Ireland)	2	4	1	
At L.10, and under L.20	4	8	2½	
... 20 ... 25	6	12	3½	
... 25 ... 30	7	14	4	
... 30 ... 40	8	16	4½	
... 40 ... 50	9	18	5½	
... 50 or upwards	11	0	6	
Retailers of spirits and beer whose premises are rated under L.10 per annum (Scotland)	4	4	0	
At L.10, and under L.20	5	5	0	
... 20 ... 25	9	9	0	
... 25 ... 30	10	10	0	
... 30 ... 40	11	11	0	
... 40 ... 50	12	12	0	
... 50 or upwards	13	13	0	
Retailers of spirits in Ireland, being duly licensed to sell coffee, tea, &c., whose premises are rated under L.25 per annum	9	18	5½	
At L.25, and under L.30	11	0	6	
... 30 ... 40	12	2	6½	
... 40 ... 50	13	4	7	
... 50 or upwards	14	6	7½	
Sweets, retailers (United Kingdom)	1	2	0½	
Tobacco and snuff, and manufacturers of not above 20,000 lb.	5	5	0	
Above 20,000, not above 40,000 lb.	10	10	0	
... 40,000 ... 60,000	15	15	0	
... 60,000 ... 80,000	21	0	0	
... 80,000 ... 100,000	26	5	0	
Above 100,000	31	10	0	
Beginners (and a surcharge on the quantity made)	5	5	0	
Dealers in tobacco and snuff	0	5	3	
Vinegar makers	5	5	0	
Dealers in foreign wine, not having licenses for retailing spirits and beer	10	10	0	
Dealers having a license for retailing beer, but not spirits	4	8	2½	

Lichfield	Dealers having licenses to retail beer and spirits.....	L.2	4	1
||	Grocers who sell wine not to be drunk or consumed on			
Liechten-	the premises (Scotland), viz. :—			
stein.	Every grocer having the justices' certificate			
	to retail beer, but not spirits	4	8	2½
	To retail beer and spirits.....	2	4	1
	Stage carriage, licensed to run (Great Britain).....	3	3	0
	... supplementary license.....	0	1	0
	Every mile licensed to travel.....	0	0	1
	Hackney carriage, license to keep (London).....	1	0	0

LICHFIELD, an episcopal city, a county in itself, and a municipal and parliamentary borough of England, Staffordshire, is situate in a fertile valley, 119 miles N.W. from London. Extensive breweries and carpet manufactories afford employment to the majority of the population. The city has a free grammar school, said to have been founded by Edward VI.; several national schools; hospitals, &c. The other public buildings are a guildhall, a jail, a theatre, a market-house, a house of correction, the churches of St Mary, St Chad, St Michael, and the cathedral, a most noble structure, partly of early English, and partly of later architecture, and surmounted by three beautiful spires. Lichfield returns two members to parliament, and is governed by a mayor, six aldermen, and eighteen councillors. To Dr Samuel Johnson, who was a native of the town, a monument has been erected in the cathedral. The monument of two children is one of the fines of Sir F. Chantrey's works. Pop. (1851) 7012. See Harwood's *Lichfield*.

LICHTENBERG, GEORGE CHRISTOPHER, the famous illustrator of Hogarth, and caricaturist of Lavater, was born in 1742 at Ober-Ramstadt, near Darmstadt, where his father was pastor. He studied at Darmstadt and Göttingen, at which latter university he was appointed to a professorship in 1770. He was raised to the chair of experimental philosophy in 1777. Previously to this he had twice visited Great Britain, and made himself thoroughly master of English literature. In his declining years he was subject to fits of depression and hypochondria, which severed him almost entirely from the world. He died in 1799. His works were collected by F. G. Kries, in 9 vols., Gött. 1800–1806; and his *Erklärung der Hogarth'schen Kupferstiche*, which remained unfinished at his death, was published in 1794–99.

LICHTENBERG, a principality of Germany, in the S. of Rhenish Prussia, and on the confines of Rhenish Bavaria. Area 232 square miles. The surface is mountainous and well wooded. It was ceded to Prussia by the Duke of Saxe-Coburg-Gotha, in 1834, for an annual rent of 80,000 dollars (L.11,583), and it now forms part of the government of Treves. The capital was St Wendel. Pop. about 38,000.

LICINIUS STOLO. See ROMAN HISTORY, § 2.

LICTORS. See FASCES.

LIECHTENSTEIN, a small independent state of Southern Germany, bounded on the W. and S. by Switzerland, and E. and N. by Tyrol. Area 53 square miles. The inhabitants are chiefly engaged in agriculture and cattle rearing. Some wine is produced. This is the smallest of the states forming the German Confederation, to which it furnishes a contingent of sixty-four men. It has one vote in the full council, and, with several of the other small states, occupies the fifteenth place in the diet. The Prince of Liechtenstein has also extensive possessions in Austria, among which are the dependent principalities of Troppau and Jägerndorf, and which have altogether an area of 2212 square miles, and a population of 600,000. His income from these possessions amounts to at least 1,500,000 florins annually, while the revenue of Liechtenstein itself is only about 22,000 florins. Pop. (1853) 7000. Vadutz or Liechtenstein, the capital, has only about 10,000 inhabitants.

LIÈGE, an important province of Belgium, is bounded on the N. by Limburg, E. by Rhenish Prussia, N.W. by South Brabant, S.W. by Namur, and S. by Luxemburg. Area 1115 square miles. Its surface is level in the N. and N.W., but in the S. and E. parts it is mountainous, and covered by extensive woods, including a portion of the forest of Ardennes. The Meuse, the principal river in the province, flows from S.W. to N.E., through a long and fertile plain, and is joined near the city of Liège by the Ourthe, previously augmented by its tributaries, the Ambleve and the Vesdre. Liège contains several mineral springs, the most celebrated of which are those of Spa. The hot spring of Chaudfontaine is on an island of the Vesdre, about 5 miles from the city of Liège. Its water, which is pumped up by means of a wheel turned by the river, supplies a large bathing establishment, much frequented by visitors. The climate in the N. parts of the province, although damp, is in general healthy. In the S. parts the air is keener and the winter longer. The soil in general is fertile and well cultivated, especially in that long sweep of level land traversed by the Meuse, where hops, corn, and wine are produced in abundance. Large numbers of sheep and cattle feed on its pastures. The chief minerals found in Liège are calamine, lead, alum, and iron ores. The coal mines, however, are the great source of industry and wealth, and in 1850 amounted, in this province alone, to 116. The articles manufactured are chiefly woollens, hardware, iron, and especially fire-arms; and all these, together with cheese, Spa-water, timber, coal, and minerals, constitute the exports of the province. The principal seats of the woollen manufacture are Herve and Verviers; those of the iron manufacture are Herstal, Seraing, and Liège. Glous is celebrated for its straw hats. For the purposes of government, Liège is divided into three arrondissements,—Liège, Huy, and Verviers, and subdivided into twenty-one cantons. Previous to 1789, this province was governed by the Bishop of Liege, who was a prince of the empire. It was afterwards subject to the French till the fall of Bonaparte, when it was incorporated into the kingdom of the Netherlands. In 1830 it became a part of the kingdom of Belgium. Pop. (1854) 494,793. See BELGIUM.

LIÈGE (Dutch *Luyk*, Ger. *Lüttich*), an important manufacturing town of Belgium, capital of the province of Liège, situate near the confluence of the Ourthe and the Meuse, in N. lat. 50. 39. 22., E. Long. 5. 31. 42.; 54 miles E. by S. from Brussels. Though in a fine situation, the city is by no means beautiful and healthy, owing to the smoke of its numerous manufactories, the narrowness of many of its streets, and the height of many of its houses. It is divided into two portions, the upper and the lower town: the former on the declivity, and the latter at the foot of a hill. The River Meuse, on entering the town, divides into several branches, which are lined by quays, and crossed by numerous bridges. Liège is famous for its manufacture of iron; and the fire-arms, cannons, and machinery it produces, are said to surpass in quality those of all other countries except Great Britain. The number of cannons and fire-arms submitted to the Board of Approval, in 1849, were 405,030; and in 1850, 432,347. There are large factories at several of the suburbs, especially at Seraing, where spinning machinery and steam-engines are extensively produced. The other manufactories of Liège are,—hardware of all kinds, woollen and cotton fabrics, hats, glue, tobacco, glass, leather, and other articles. There are likewise steel-works, breweries, distilleries, tanneries, and dyeing-houses. The city has a considerable trade, which is greatly facilitated by the roads, railways, and canals, that traverse the country in all directions. The great cause, however, of its prosperity are the coal-mines that abound in the neighbourhood, and are extended even under the town and the River Meuse. Besides coal and iron, the district produces also zinc, lead,

Liegnitz
||
Life-Pre-
servers.

copper, sulphur, alum, marble, and slate. Liège was once fortified, but its sole defence now is a citadel erected at the N. side of the city, on St Walburg's Mount. Its churches are numerous, of which the following are the principal:—The cathedral, founded in the thirteenth century; the church of St Jacques, the finest of all the sacred edifices; and the churches of St Denis, St Bartholomew, St Croix, and St Martin. The university, erected by the King of Holland in 1817, comprises the faculties of law, theology, and medicine; and possesses a museum, containing, among many other specimens, a collection of fossils chiefly culled in the neighbourhood. Besides the Palais de Justice, which is a splendid specimen of ancient architecture, the other public buildings are, a theatre, an episcopal seminary, a royal college, several schools, a library, containing, in addition to numerous volumes, many curious manuscripts, an academy of fine arts, and other educational and benevolent institutions. Liège is the see of a bishop, and the seat of a superior court of justice. In the tenth century, the Emperors of Germany elevated the Bishops of Liège to the rank of independent princes. In 1467, the citizens, rebelling against their liege lord, Charles the Bold, were compelled by him to raze a great part of their fortifications. Pop. (1851) 81,789.

LIEGNITZ, one of the three governments into which Prussian Silesia is divided, comprising the N.W. part of Upper Silesia, and that part of Upper Lausatia which now forms part of Prussia. It is bounded on the N., N.E., and N.W. by the provinces of Posen and Brandenburg, S.E. by the government of Breslau, and S.W. by Bohemia. Area 53,000 square miles. The surface is rugged and mountainous in the S., and traversed by ridges of the Riesengebirge, several of which exceed 4000 feet in height. It then slopes rapidly northward to the great plain of the Oder, which flows from S.E. to N.W. through the government, and forms part of its northern boundary. Besides the Oder, the chief rivers are its affluents, the Katzbach, Bober, and Neisse. The soil is generally sandy, and the corn produced is not sufficient for the wants of the inhabitants. Large numbers of sheep and cattle are reared. Pop. (1849) 921,002.

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LIEGNITZ, the capital of the above government, is situated at the confluence of the Schwarzwasser and Kartzbach, on the Berlin and Breslau Railway, 40 miles W.N.W. of the latter town. It was formerly a place of some strength, but its ramparts are now laid out in public gardens, and only its four gates remain entire. The town, though old, is handsomely built and pleasantly situated. Its old castle has been mostly rebuilt since a fire, which destroyed a great part of it in 1834. In the *Fürsten Capelle* are monuments of the princes of the line of Piast, a family which, from 775 to 1675, when it became extinct, gave twenty-four kings to Poland, and 123 dukes to Liegnitz. This town is the seat of superior, judicial, and other courts for the government; and has a gymnasium, a *Ritter* academy for the education of the sons of Silesian noblemen, an orphan asylum, two hospitals, workhouse, and theatre. The chief manufactures are woollen, linen, and cotton stuffs, starch, beer, and tobacco. There are numerous gardens in the vicinity, and the gardeners are reported to be the most skilful of any in Silesia. Here, on 16th August 1760, Frederick the Great totally defeated the Austrians. Pop., including military (1849), 14,934.

LIERRE, or LIER, a town of Belgium, province of Antwerp, at the confluence of the Great and Little Nethe, 10 miles E.S.E. of Antwerp. It is generally well and regularly built, and has a large and elegant church, hospital, prison, barracks, orphan asylum, and several almshouses. The Nethe is navigable up to the town, and affords it the means of carrying on a considerable trade in its various manufactures. These comprise cotton, woollen, and silk fabrics, lace, soap, leather, cutlery, beer, brandy, tobacco, &c. Pop. (1851) 14,069.

LIEUTENANT (*locum tenens*, holding the place of), in a military sense, means the person second in command: as, lord-lieutenant, one who represents the prince or governing power; lieutenant-general, one who stands next to the general; lieutenant-colonel, the next to a colonel; and lieutenant, the next to a captain, in every company of both foot and horse, and who takes the command upon the death or absence of a superior officer. See ARMY, COMMISSION, &c.

LIFE-GUARDS. See GUARDS.

L I F E - P R E S E R V E R S .

ALTHOUGH it too frequently happens that an accident which materially endangers the life of an individual, deprives him, in the meantime, of that presence of mind which alone would enable him to take proper measures for his safety; yet to have meditated, in an interval of leisure, upon the best method of proceeding in case of emergency, must tend greatly to diminish the embarrassment and confusion that commonly accompany the accident, even if it should not be thought necessary to provide any particular apparatus for the purpose of escaping the danger. There are also many ways in which those who are not immediately involved in the disaster may contribute to the preservation of life, whether actuated by interest, or by humanity only; and the modes of relief will therefore be naturally divided into the *internal* and the *external*, whether relating to *fires* or to *shipwrecks*.

Internal Fire-Escapes.—Whenever a family establishes itself in a residence not detached from others, it becomes of importance to ascertain what facilities the house affords for ascending to the roof, and for passing to those of the neighbouring houses. It is scarcely possible that a conflagration should extend at once to the contiguous houses on each side, before the inhabitants of the house in question

have had time to escape. But in a detached house, if there are not two or more staircases remote from each other, and even in a house contiguous to others, when there is no facility of communicating by the roof, it becomes highly expedient to provide some *internal means* of escaping through the windows in case of fire, and to have on every floor a strong rope, with a hook or a loop at the end, by which it may be fastened to a bed-post, so as to enable an active person to descend by its help out of the window, finding from time to time a partial footing in the inequalities of the wall. This process will be greatly facilitated by having the rope knotted at intervals of about a foot throughout its length; the knots being nearly as convenient as the blocks or clips that are sometimes made for the purpose of retarding the descent, by holding them, and regulating the friction by the pressure of the hand;¹ unless the clip be attached to a strong cross bar, on which a person may sit, while he regulates the position of the clip by its handles, and allows himself to descend with more or less velocity at pleasure. The arrangement for this purpose may be made by a roller, or pipe, sliding on the rope, and pushed down so as to open the handles of the clip and tighten its teeth

¹ Emerson's *Mechanics*, figs. 228, 229; Leupold's *Theatrum Machinarum*, plate liv.

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when the person holds by the roller and draws it down (fig. 1); and, on the contrary, the clip may be opened by pressing on the handles with the other hand, or with the thighs; or any other simple mode of regulating the clip may be adopted, provided that it be not liable to be misunderstood, or misapplied, in a moment of confusion. After all, a rope-ladder would perhaps be preferable, as not being liable to be deranged; it is often kept ready made in the shops; and, in the absence of any other rope, a common bed-cord will generally be found strong enough to support the weight even of a stout man; for a quarter-inch rope may be safely trusted with 2 cwt., and ought indeed to support three times as much, if new and of good quality.

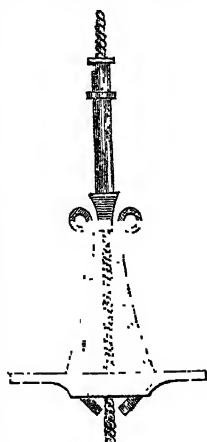


Fig. 1.

In speaking of the duty of providing internal means of escape, Mr Baddeley remarks,¹ that "egress can sometimes be made at the top of a house, either by a door or by an opening made in the roof with a poker for the purpose. Sheets and blankets tied together and fastened to the bed-post, or the bed-cords attached in the same way, afford the means of descending; the feather-bed, &c., thrown out serve to break the fall when jumping from the window as the last alternative. With a little contrivance, women and children may be lowered by means of the bed-clothes. Upon these occasions, all depends upon the persons in danger retaining so much presence of mind as will enable them to avail themselves of the best means in their power; and it often happens that pressing danger develops a great deal more ingenuity and intrepidity in individuals than they have previously taken credit for."

External means of escape from fire.—The external means to be employed in cases of conflagration must be provided by the managers of fire-offices, or by other public officers; and every ingenious workman whom they may employ will be able, at his leisure, to devise such apparatus as he can the most conveniently execute, and to give it a full trial in the absence of all danger; it will therefore only be advisable that he should compare for himself the particular inventions which have been suggested for this purpose, and that he should choose from among them such as he thinks most likely to do him credit; and he may, indeed, very possibly find means of improving on any of them.

In Leupold's *Theatrum Machinarum* (plates liv. lv.), we find the representation of a chair calculated to be drawn up or down by means of pulleys. Mr Varcourt obtained, in 1761, the approbation of the Parisian Academy of Sciences for his invention of a hollow mast, fixed in a waggon, and supporting a stage, with the means of ascending and descending. (*Hist.* p. 158.) In the beginning of the present century, a fire-escape of Mr Audibert was approved by the Parisian Institute. (*Mém. Inst.* iv.) A committee was also appointed for examining several similar inventions at the Lyceum of Arts, and a medal was awarded by it to Mr Dajon, for his apparatus, which consists of a platform carried on wheels, supported by three frames, with brass wires, on which boxes are made to slide up and down for the conveyance of persons or of furniture. (*Annales des Arts. Répertoire* ii., vol. i., p. 439.) Mr Collin's invention of pipes raised by ropes, and affording a centre to a long lever, is described in the fourth volume of the *American Transactions*, and in the *Repertoire* (vol. xv., p. 35). In the thirty-first volume of the *Transactions of the Society of Arts* for 1813 (p. 244), we have an account of a fire-escape

invented by Mr Adam Young, for which he received a Life-Pre-medal from the society. It appears to constitute by far the most portable of ladders, consisting of cross bars or rounds connected by ropes, and having their ends fitted together, so as to form a pole, which is readily elevated to the window; and the rounds being separated, and the hooks at the end properly fixed to the window-frame, the whole forms itself into a very convenient ladder of a mixed structure. The thirty-fourth volume, for 1816 (p. 227), contains a description of Mr Braby's fire-escape, consisting of a car made to slide on a strip of plank fixed to a pole, and governed by a rope, which is cased with iron, to protect it, in case of necessity, from the effect of the fire.

The fire-escape in use in the metropolis is founded on the invention of Mr John Davies, submitted to the Society of Arts in 1809. It consists of three ladders connected to, and sliding upon, each other by means of ropes worked by a small windlass; a second windlass raises and lowers a cradle, which is supported by ropes passing over pulleys at the top of the uppermost ladder. This machine is mounted upon a low four-wheeled truck, and can be drawn by a horse, or by six men. As improved by Mr Gregory, the three ladders sliding on each other, when lowered, are balanced horizontally on a frame, mounted on a light four-wheeled carriage, so as to be run under low gateways, &c. The ladders being brought into a nearly vertical position, are raised by a small windlass in front of the machine to any height between 10 and 40 feet; when the ladders are inclined towards the window, and the top one made to rest against the sill. A greater elevation than 40 feet may be obtained by means of joints fixed at the top, and a cradle is also used for those who are too timid to descend ladders.

A great many other forms of fire-escape might be noticed, for it is one of those subjects which readily appeal to the ingenious mechanic in a large city where fires are numerous; and every form of fire-escape must at times fail. Hence there has been a sort of competition among uneducated inventors, who have displayed some mechanical ingenuity, but have not, as far as we are aware, developed any new principle.

The modes of extinguishing fires are not precisely the object of the present inquiry. The engines employed for the purpose are described under *HYDRODYNAMICS*. Within the last few years, an apparatus called a *fire-annihilator* has attracted some attention; its object is to generate a large amount of gaseous matter, which will not support combustion, and which being injected into the burning mass, is to extinguish the fire by displacing the air. The non-supporting gases are generated by means of chlorate of potash and sugar contained in a perforated cylinder, and ignited, when required, by crushing a small glass vessel containing sulphuric acid. There is also a contrivance for saturating the gases with moisture.

Many attempts have been made to prevent fires by rendering houses fire-proof, either by coating the timber with some unflammable substance, or by rejecting combustible substances altogether in building. The Earl of Stanhope's method of fire-proofing consisted in the use of non-combustible materials, with, among, and between the timbers forming the frame-work of a house. Many other methods have been proposed for coating the timbers with plaster, covering the houses with fire-proof paint, soluble glass, &c. We do not attach much importance to these inventions, for if the house contain goods and furniture of an inflammable kind, and the fire once obtain an ascendancy over them, the house will scarcely escape destruction. In the construction of floors and roofs, Messrs Fox and Barrett propose to substitute for timber joists of iron, and successive layers of incombustible materials, such as mortar, concrete, &c., the floors being finished with a smooth and uniform

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¹ Hebert's *Engineers' and Mechanics Encyclopædia*.

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surface of lime and sand well trowelled up to a face, and coated with linseed oil; while the roofs are finished with a coating of coal-tar, paper, and sand, instead of the ordinary timber and slate. Mr Frost proposes for the floors of rooms to use hollow earthenware tubes, embedded in cement, and so combined as to cover the whole floor. Mr Loudon recommends that the floors be formed of flat tiles and cement. Mr Payne proposes to render timber fire-proof by means of a solution of sulphuret of barium or of calcium, forced into the timber by appropriate apparatus, and then adding an acid or a solution of some substance, such as sulphate of iron, which unites with the barium or calcium, and sets free the sulphur. Iron joists and girders have been largely used in the construction of fire-proof buildings; but it has been shown by Mr Braidwood, that a fire originating in the goods stored in these so-called fire-proof warehouses sometimes produces a temperature nearly equal to the melting point of cast-iron; while the jets of water from the fire-engines crack and bring down beams and columns of cast-iron which are used in supporting the upper floors, so as really to cause a greater destruction of life and property than timber beams, which resist the fire for a considerable time, and permit the inmates to escape, and the firemen to penetrate the building with their branches and water-hose, which they are sometimes forbidden to do if the building is known to have iron-girders. A better plan for fire-proof buildings seems to be the use of groined brick arches, supported by pillars of brick laid in cement.

Internal Means of Escape from Shipwreck.—The means of escaping from shipwreck may be similarly divided into *internal* and *external*, or into the precautions to be taken by the ship's company, and the measures to be adopted by persons on shore. The internal means depend either on enabling the individuals to swim or float, or establishing a connection with the shore by ropes; and of the former, we may first consider those which require no particular preparation before the occurrence of the accident that calls them into action, and which are, therefore, the most universally applicable.

Of such expedients, the most effectual appear to be those which depend on the employment of empty water-casks for assisting the ship's company to drift on shore. 1. A paper on the arrangement of water-casks, to serve as floats in case of shipwreck, appears in the publications of the Society for the Improvement of Naval Architecture, dated in 1796 (vol. ii., p. 51). 2. In 1818, Mr Grant of Bideford obtained a gold medal from the Society of Arts, for the invention of a life-preserver, consisting of a thirty-six gallon cask, with some iron ballast fixed on a wooden bed, and lashed to the cask, and with ropes round it for the men to hold; and it was found that ten men were supported by it with convenience in tolerably smooth water, the bung of the cask being well secured by cork (vol. xxxvi., p. 63). The ballast could be of very little use, and a cask simply tied round with a rope, like a common parcel, would probably answer the purpose equally well. It would, indeed, be prudent for every ship in a storm, on a lee shore, to have a few of her casks well emptied and stopped, and tied in this manner, before the actual occurrence of imminent danger. 3. In the thirty-seventh volume of the *Transactions of the Society* (p. 110), there is an account of Mr Cook's life-raft, consisting of a square frame with canvas nailed across it, supported by a cask at each corner, for which the gold medal was voted to him. 4. It is followed by a description of Lieutenant Rodger's life-raft (p. 112), which obtained a similar compliment. This raft has the advantage of requiring only such materials as are usually found on board of every ship; capstan-bars, boat-masts, yards, or any other spars of moderate dimensions, which are tied together so as to make a sort of waggon frame, with a large cask fixed on each side; it appears to

afford a very convenient support to the men, but it can scarcely possess any great strength for resisting the force of the breakers.

Mr J. Bremner, a clergyman in the Orkneys, had received a medal from the Society in 1810, for his method of converting any ship's boat into a life-boat by putting into it three or four casks lashed to the keel, which is to have ring-bolts fixed in it for receiving the ropes by which the casks are fastened; he gives particular directions for making all the necessary arrangements, in the twenty-eighth volume of the *Transactions* (p. 134); he particularly advises that no use should be made of the natural buoyancy of the cavity of the boat, but that the bottom should be perforated without hesitation, wherever the hole would afford any additional facility for fixing a rope. Captain Manby's jolly-boat, fitted as a life-boat, "at the expense of three pounds," seems to be comprehended among those preparations which are to be made previously to the voyage.

The buckling a soldier's canteen on his breast as an assistance to enable him to float, belongs to those temporary expedients which may occasionally be employed with advantage. Tying a hat in a pocket-handkerchief, and holding it as a float, has been recommended by Mr Lawson in the *Philosophical Magazine* (vol. xx., p. 362); he advises that the crown of the hat should be held downwards, and observes that a stick may be employed, to enable us to use two or four hats at once; but this method can only be adopted when the accident occurs in very still water.

The first and most obvious preparation for enabling a person to float, is the learning to swim. It is well known that swimming is scarcely ever sufficient to enable a seaman to reach the land from a ship that has been wrecked, without some assistance; and many have certainly been drowned from depending too much on their own strength; but for a momentary support, and to afford courage and presence of mind to seek for other aid, there is no question but that the faculty of swimming possesses an inestimable advantage. A boy generally learns to swim by the help of his schoolfellows better than by any general rules, and more agreeably than in a school of natation; but it may be of some use to observe, that the act of diving to the bottom and re-ascending, in tolerably shallow water, is much more easily performed by a beginner than that of simply supporting himself on the surface; and when he has thus acquired the feeling of the immediate effect of his arms in propelling and sustaining him, he soon finds out the means of employing his feet in their assistance. The art of swimming has, however, been systematically treated by Bachstrom, *Kunst zu Schwimmen*; 8vo, Berlin, 1742; by Thévenot, *Art de Nager*, Paris 1711, and by Bernardi, *Arte Ragionata del Nuoto*, 2 vols. 4to. Naples, 1794.

It is easy to convince ourselves, by trials in a warm bath, without reference to Robertson's experiments (*Phil. Trans.* 1757), that a substance possessing a very small degree of buoyancy is sufficient to enable the human body to float without effort. In fact, when the chest is fully expanded, the thinnest and most bony person will commonly float in sea-water; but the effort of keeping the chest expanded is as fatiguing as any other muscular exertion; and when the chest collapses, the fattest people may be in danger of sinking, unless they have learned to swim. Sir William Hamilton, indeed, tells us that, in 1783, "a woman of Scilla, four months gone with child, was swept into the sea by the wave" accompanying the earthquake, "and was taken up alive, floating on her back at some distance, nine hours after; she had been used to swim; her anxiety and suffering, however, had arrived at so great a pitch, that just at the time that the boat which took her up appeared, she was trying to force her head under water, to put a period to her miserable existence."

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In China, a frame of bamboo surrounding the person is used for a float, and the lightness and strength of this substance must well adapt it for the purpose; sometimes also a gourd is tied to a child, to secure its floating in case of accident. The inflated goat-skins used from time immemorial by the Arabs, or the seal-skins employed by the Chilians, have the disadvantage of being easily rent or torn by a rock or a spar; an objection which is also more or less applicable to all substances containing air; for example, to the air-jackets described in Leupold's *Theatrum Pontificum*, published about 1724. A float of a semicircular form was recommended by Ozanam, the author of the *Recreations*; and Bachstrom, in his *Art of Swimming*, proposed to float a troop of cavalry, by fixing cork to the saddles. The cork jacket of Gelacy is described in the *History of the Parisian Academy of Sciences* for 1757, and Lachapelle's *Scaphander*, which is considered an improvement on it, in the volume for 1765. In the year 1764 the attention of the British public was particularly called to the floating powers of cork, by some experiments which were made with cork jackets on the Thames, together with some comparative experiments on air-jackets; and Dr Wilkinson, in the *Philosophical Transactions* for 1765, describes some experiments by which he ascertained that about a pound of cork was amply sufficient to enable a man of ordinary size and make to float without effort. It is almost superfluous to enumerate the multitude of trifling variations that have been made in the arrangements of cork jackets and air-jackets, apparently for the purpose of exciting a momentary interest, though possibly from the best motives. Mr Bosquet advised a bag of cork shavings to be kept in readiness by each person; the *Seaman's Friend* was composed of two pieces of cork, united by straps; the *Collinetta* was a hollow vessel of copper, divided into cells; a "marine spencer" has been described by Mr Spencer, in the sixteenth volume of the *Philosophical Magazine*, consisting only of a number of old corks, arranged so as to form a girdle; and in 1806, Mr T. C. Daniel obtained a gold medal from the Society of Arts, for the invention of an apparatus of waterproof leather, surrounding the body, which, according to the testimonials he produced, had saved the lives of some persons who had been sailing in a pleasure-boat on a river. In smooth water, it has been suggested that throwing a foot-ball, with a small weight tied to it, to the person immersed, would often afford sufficient assistance; and, with respect to floating, there is no doubt that any of the assistances which have been proposed would be sufficient if they were at hand: but there is another object, to which it is necessary to attend, in cold, and even in temperate climates, that of supporting a temperature compatible with life and health, if the immersion is likely to be of long duration; and an additional provision of worsted stockings, jackets, and trowsers, will be almost as essential, in such cases, as the means of obtaining buoyancy.

The invention of India-rubber cloth led to the introduction of inflated belts, the advantages of which, compared with cork, and other forms of belt, are their greater buoyancy compared with their bulk, and their greater portability, for, when emptied of air, they can be folded up, and packed into a small space. The objections to them are their liability to get punctured or torn, and to decay, from being put away damp; the metal valves by which they are inflated may also get out of order; during the hurry and confusion of a wreck they are liable to be only partially inflated, and the valves to be only half screwed up, so as to allow of the escape of the inclosed air.

Commander J. R. Ward, R.N., inspector of life-boats to the National Life-Boat Institution, has invented a belt with four compartments, which admit of being separately inflated, thus mitigating the danger arising from puncture or injury to the inflating valves; it has a buoyancy equal to

30 lb., and should two of its compartments be disabled, the remaining two would be sufficient to float the wearer.

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For the rough purposes of ordinary boat-work, Commander Ward insists on the advantages of cork as a material for life-belts, and he has invented a form of belt, which has been selected by the National Life-Boat Institution for the use of its life-boats' crews. The buoyant power of each belt is from 20 to 24 lb.; the cork is uncovered, so that its quality can be seen, and it is divided into numerous narrow pieces, each of which is sewed separately to a strong linen or duck belt, which covers the body from the arm-pits to below the hips. The pieces of cork are distributed in two rows, one above, the other below the waist, and the belt is secured closely about the body by means of strings passed round the waist, between the two rows of cork. It is further secured by other strings, crossed over the shoulders. By this arrangement the trunk of the body is enveloped in cork, attached so as to be quite flexible, and to allow of the usual movements of the body without inconvenience, while it protects the body against injury from blows, and is a warm covering in cold weather.

Various forms of buoyant mattress have been contrived by Mr Laurie and others. As manufactured by Mr Silver, numerous waterproof tubes are partly distended with horse-hair, woollen flocks, or cocoa-nut fibres, so that, should one or more of the tubes fail, the others may suffice to sustain the required weight on the water. The tubes are made up into mattresses, pillows, and floats,—the last to be placed under the thwarts of boats. A mattress weighing 17 lb. sustains in the water 284 lb. A pillow sustains 28 lb. A mattress for emigrant vessels, sold at 9s., was proved at the Great Exhibition. It sustained 96 lb. in the water during five days, without being injured. Floating mattresses are also made, filled with cork shavings. In the Great Exhibition, Mr Rhind had various models of deck seats and benches for steamers, so constructed as to be readily formed into rafts, each of which was capable of sustaining eight persons.

For the second object which is desirable to a ship in distress, that of obtaining a safe communication with the shore, it has been usual of late years to rely principally on the humane exertions of persons who may be on the coast, and who may have made preparations for this purpose; and with this view, some instructions for properly co-operating in the measures to be adopted with Captain Manby's apparatus have been liberally distributed to all ships when they received their papers from some of the British custom-houses. There are, however, some simple expedients which may be adopted for this purpose by persons on board of the ship; for example, the making a kite with a pocket-handkerchief stretched over a hoop, and causing it to carry a cord to the lee shore, by means of which a stronger line, and at last a hawser, may be drawn by persons standing on the beach. A line may also sometimes be carried on shore by a cask, allowed to drift before the wind; and a bag has been recommended to be attached to such a cask, or to a buoy, in order to act as a sail, and to insure its crossing the surf. Mr Cleghorn was also rewarded, in 1814, by the Society of Arts, for the invention of a buoyant line, having a heart of cork, to obviate the inconvenience which would arise from its sinking and being dragged on the stones under the breakers; but he observes, that in heavy storms there is generally a current along shore which renders the method almost impracticable. (*Transactions*, xxxii., p. 181.) A Mr Wheatley assures us, in Captain Manby's *Essay*, that his own life, and that of eight other persons, was saved, in 1791, by a lead line, which was carried on shore by a Newfoundland dog that he happened to have on board, when two good swimmers had been drowned in the attempt to swim on shore. It had occurred to Lieutenant Bell, in 1791, that a rope might be thrown from a ship which had

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struck, by means of a mortar carrying a heavy shot, and upon the principle of the gun harpoon; and he showed the practicability of the suggestion by an actual experiment, in which a deep-sea line was carried to a distance of about 400 yards. (*Trans. Soc. Arts*, xxv, p. 136.) He recommended that every ship should be provided with a mortar capable of carrying such a shot, and observed that it might be placed on a coil of rope to be fired, instead of a carriage. The line was to be coiled on handspikes, which were to be drawn out before the mortar was fired. In 1792 he received a premium of fifty guineas from the Society of Arts (*Transactions*, x, p. 204); and he obtained his promotion in the Ordnance as an acknowledgment of his merits. The shot was to weigh about 60 lb. or more, and the mortar 5 or 6 cwt. The experiments of the French artillery at Laferre were subsequent to those of Mr Bell, though they have sometimes been quoted as the first of the kind.

It has, however, generally been thought impracticable to manage a mortar with effect under the circumstances of actual shipwreck; and Mr Trengrouse has preferred a rocket, as more easily fired, and as having a smaller initial velocity than a shot, so that the rope would be less in danger of being broken by the impulse. He found that a rocket of 8 oz. carried a mackerel line 180 yards, and a 1 lb. rocket 212; and, in some experiments made under the inspection of the Society of Arts, a rocket $1\frac{1}{4}$ inch in diameter carried a cord across the Serpentine River in Hyde Park. The musket is provided with a valve, to prevent the escape of the materials of the rocket, and it is to be fired with a little powder, without wadding. The whole apparatus is packed in a chest, containing from eight to twelve rockets, the musket, a life-spencer, a chair to traverse on a rope, a canvas bag, and a ball of wood to throw to a person swimming. Mr Trengrouse was complimented with a medal from the Society of Arts in 1820. (*Vol. xxxviii*, p. 161.)

External Means of Escape from Shipwreck.—The means to be employed by persons on shore, in cases of shipwreck, depend either on projecting a line over the ship, or on the use of a life-boat. Mr Bell had cursorily observed that a line might be carried over a ship from the shore by means of his mortar; but for the actual execution of this proposal, in a variety of cases, we are indebted to the meritorious exertions of Captain G. W. Manby, whose apparatus, according to the report of a committee of the House of Commons, dated in March 1810, appears "to be admirably adapted to its purpose, and to have been attended with the fullest success in almost every instance." In consequence of this report, Captain Manby was thought worthy of a parliamentary reward; and he afterwards published a description of his inventions, under the title of *An Essay on the Preservation of Shipwrecked Persons*, 8vo, London 1812. He had previously received a gold medal from the Society of Arts in 1808 (*Transactions*, xxvi, p. 209). His success makes it expedient to extract from his *Essay* a detailed description of the apparatus, and it will be easy to make it somewhat more intelligible by a slight alteration of the order of arrangement.

"The method of affixing a rope to a shot, for the purpose of effecting communication, when projected from a piece of ordnance over a stranded vessel, was at length succeeded in, by introducing a jagged piece of iron, with an eye at the top, into a shell, and securing it by filling the hollow sphere with boiling lead; and in another way, by drilling a hole through a solid ball, and passing a piece of iron, with an eye to it, as before described, to the bottom, where it should be well secured by riveting.

"To produce the means of connecting a rope to a shot, and prevent its being burnt, and rendering it 'irresistible' to the powerful inflammation of gunpowder, was the labour of infinite time, and the number of experiments to accom-

plish it is beyond all possible conception. Chains in every variety of form and great strength breaking, proved that it required not only an elastic, but a closer connected body. At length, some stout platted hide (fig. 2), woven extremely close to the eye of the shot, about 2 feet in length beyond the muzzle of the piece, and with a loop at the end to receive the rope, happily effected it.

"This method is certainly desirable, as the rope may, immediately [as] it is required, be affixed to the loop, and applied in service. The form of the platted hide may

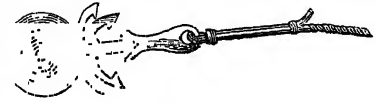


Fig. 2.

likewise be woven by twisting it in the manner that the lashes of whips or ropes are spun; there is another

method, by passing the rope through a case of leather, taking the greatest care that it is so well secured at the eye of the shot, as to leave no room for the slightest play, as is represented by the annexed *barbed shot* (fig. 3).

"When the crews of the distressed vessel are incapable of availing themselves of the benefits arising from communication, they having previously lashed themselves in the rigging to prevent being swept away by the sea, which is repeatedly breaking over them, and when, from long fatigue and the severity of the storm (on which occasions it too frequently occurs), they totally lose the use of their limbs, and are rendered incapable of assisting themselves in the slightest degree—the advantages of this shot are, that, on its being projected over the vessel, and the people of the shore hauling it in, it firmly secures itself on some part of the wreck or rigging, by which a boat can be hauled to the relief of the distressed objects; and by the counterbarbs it is rendered impossible [that it should] give up its hold, or slip, while that part of the wreck remains to which it has secured itself.

"Among the many that have been saved by this shot, the following are testimonials of a few of the cases:—'We, the crew of the brig Nancy of Sunderland, do hereby certify that we were on board the said vessel when she was stranded on the beach of Yarmouth, on Friday morning, the 15th of December 1809, and compelled to secure ourselves in the rigging to prevent being swept away, the sea running so high over the vessel. And we do further declare and certify that Captain Manby, firing a rope with a hooked shot, securely holding on the wreck, enabled a boat to be hauled from the shore over the surf to our relief; otherwise we must inevitably have perished.' This certificate is attested by six signatures.

"Facilitating communication is at all times of importance; but when the stranded vessel is in momentary danger of going to pieces, this point becomes a consideration of extreme urgency. I feel a persuasion that this particular service can only be carried into effect by a small and light piece of ordnance, the range of which is consequently very inconsiderable, when compared with that of a large and heavier piece, as it is weight alone that conveys the rope. In order, therefore, to increase the powers of a shot projected from a small mortar, its natural form must be varied, so as to give it additional 'preponderance.' The annexed shape, in the form of a pear (fig. 4), has been used with the greatest success; for, by the increased weight, the shot's momentum and power over the line is in consequence considerably augmented in its range; and when made to fit the piece as close as possible, a great increase of velocity is likewise produced from that decrease of windage.



Fig. 4.

Life-Pre-
servers.

Life-Pre-
servers.

"Portability in the construction of a piece of ordnance (as just described) is the very essence of this service; and communication with the stranded vessel or wreck may be effected with a cord, by which cord a rope can be conveyed, and by that rope a hawser or cable sent to the distressed vessel; for this purpose the annexed was constructed" (fig. 5).

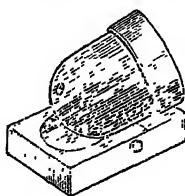


Fig. 5.

"A person completely equipped with every necessary apparatus to effect communication with a vessel driven on a lee-shore . . . the horseman, fully equipped, travelled a mile and a half, the howitzer was dismounted, and the line projected 153 yards, in six minutes.

"The application of a small piece of ordnance likewise offers particular advantages, capable of being employed from a boat to go to the assistance of a vessel grounded on a bar when running for a harbour, the necessity of which repeatedly occurs, and was twice witnessed at Blakey on the 10th of November 1810, when boats endeavoured to go to their relief, and were enabled to get out of the harbour on the ebb tide, within 20 yards of the vessel; but it was found impossible to approach them nearer. Had such boats been provided with a piece of this description, and the same firmly secured on a stout piece of plank, by the holes left at each corner of the iron bed, they might have projected a small rope, coiled in a crate or basket made to the form of the bow of the boat; and the persons in the boat, so provided, would not have remained the distressed spectators of the untimely end of their fellow-creatures, without being able to afford them the smallest relief, although so little was then wanted for that desirable purpose.

"Although advantages have been pointed out in the use of these small mortars, it is necessary to be kept in remembrance, that they are produced for particular services; as the nature of the coast, and circumstances attending the distressed vessel, will direct what piece is best adapted to the undertaking. To enable the mind to form a judgment of what can be effected by other pieces, the following are the minutes of experiments made with a $5\frac{1}{2}$ -inch brass mortar, stating the quantity of powder used, and distance the ropes were projected against a strong wind, at the angle of 17° (elevation): weight of the mortar and bed about 300 lb. :—

Ounces of Powder.	Yards of inch and half Rope.	Yards of Deep-sea Line.
4	134	148
6	159	182
8	184	215
10	207	249
12	235	290
14	250	310

"With a short 8-inch mortar, the weight of which and bed was supposed to be about 700 lb.; the angles of elevation uncertain :—

Ounces of Powder.	Yards of Deep-sea Line.	Yards of two-inch patent Sunderland Rope, capable of hauling the largest Boat from a beach.
32	439	...
32	479	...
32	...	336

"Directions for using the Apparatus.—When the rope (which should be pliant and well stretched) is brought on the beach or cliff opposite to the stranded vessel, the most even spot, and free from projecting stones, should be se-

lected to lay it on, and great care be taken that no two parts of it whatever overlay or even touch each other, nor must it be laid in longer lengths than of two yards. But to project a small line or cord, it will be necessary, if it is required, to contract the faker to half a yard at most, to avoid the jerk received at the end of each right line. The best method, with such a description of cord, is to lay it on the ground in the most short and irregular windings, to relieve it from this powerful impulse. To prove the effect of the impulse on a rope, if it is faked in lengths of 10 or 15 yards, it will break each time, as it then becomes a most powerful pendulum. These precautions are absolutely necessary to the success of the service.

"The following has, after various trials, been found a certain method of laying the rope, and placing it into compartments." (*French Faking*, fig. 6.)

"A particular attention to this mode will never fail with a good rope, when the impediments are removed that might otherwise obstruct its rapid flight. Its

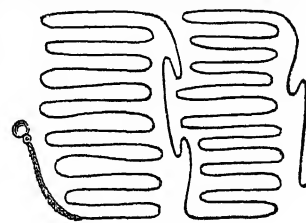


Fig. 6.

advantages are, that it will allow the eye rapidly (yet correctly, *just before firing*, which is absolutely necessary) to pass over the different compartments, and at once discover if any fake has been displaced by the storm, or by any other casualty or accident come in contact with another part, which would destroy its application by the rope breaking.

"It may likewise be coiled in the manner used in the whale fishery, *whale lair* (fig. 7); and in the method called *chain faking* (fig. 8):—

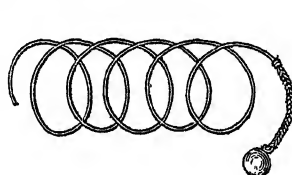


Fig. 7.

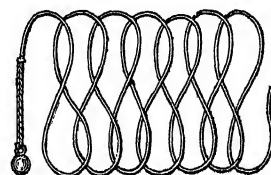


Fig. 8.

"It is, however, necessary to add, that great attention is required in laying it agreeably to the two latter methods, arising not only from the arm being liable to get under certain parts of the rope, and thereby displace it, but from the great anxiety of mind natural on these occasions, where the lives of fellow-creatures are literally dependent on the correctness with which the rope is laid; it is therefore extremely difficult, in a moment of agitation, to determine whether any overlay has taken place, an error that would infallibly destroy every endeavour, and occasion even the fate of those whose lives we might be exerting ourselves to preserve. Could persons in the performance of this service be always collected, the two latter methods would have a decided advantage over the first mode of faking, they being laid in a much less space of time.

"As all these methods of laying the rope occupy time to place it with the care necessary; and as it has repeatedly happened that vessels, very soon after grounding, have gone to pieces, and all hands perished; it was necessary to pro-

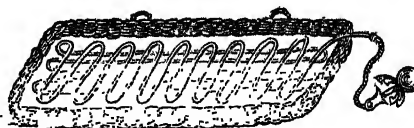


Fig. 9.

duce a method of arranging the rope, so that it could be immediately projected as soon as it arrived at the spot; and

Life-Pre-
servers.

Life-Preservers. none proved so effectual as when brought ready in a basket (fig. 9).

"In this case, the rope should be most carefully laid in alternate tiers or fakes, no part of it overlaying, and it should be well secured down, that in travelling it be not displaced; but, above all, no mistake must happen in *placing the basket properly*. For example, that the end of the basket, from which the shot hangs in the above figure, should be previously marked, and must be placed towards the sea or wreck, that the rope be delivered freely, and without any chance of entanglement. It will be scarcely necessary to add, there will be several tiers of the rope when laid. The utmost care and attention are required in laying the rope in tiers with strict regularity, to prevent entanglement."

"The next is the application of the mortar. If the wind is sideways to the shore, it must be pointed sufficiently to windward to allow for the slack of the rope lighting on the object, as the rope will, of course, be considerably borne to leeward by the effect of a strong wind, and by its being laid at a low elevation insures the rope falling against the weathermost part of the rigging. While this service is performing, great care should be taken to keep the mortar dry; nor should it be loaded until everything is ready; when that is done, it should be primed; but as it would be impossible to do it with loose powder in a storm, a tube is constructed in the simplest manner of common writing paper (the outer edge being cemented with a little gum) in this form (fig. 10). It is filled with meal gunpowder, made into paste with spirit of wine; when in a state of drying, run a needle through the centre, and take care the hole is left open, for, on the tube being inflamed, a stream of fire darts through the aperture with such force as to perforate the cartridge. The mortar should then instantly be fired; and in order to lessen a difficulty that has often occurred in performing this service, a pistol may be used, having a tin box over the lock, to exclude the effect of wind or rain on the priming; and the muzzle being cut [obliquely], dilates the inflammation, so as to require but little exactness in the direction of the aim.



"We will suppose the communication to be secured, although it is scarcely necessary to offer any other assistance than that of a rope, as the inventive genius of a sailor will supply everything else; yet I could expect the people on shore to get a boat ready for meeting the vessel when driven on a beach: it is the promptest and most certain method of relief, as well as the most easy to be accomplished; for by hauling her off with the rope projected, the boat's head is kept to the waves, and not only insures safety by rising to the surge, but prevents her upsetting."

"When the rope attached to the shot (not having barbs to it), is fired over the vessel and lodges, let it be secured by those on board, and made fast to some firm part of the rigging or wreck, that they may haul off a boat by it; but should there not be any boat, then haul on board by the projected rope a larger one, and a tailed block, through which a smaller rope is rove. Let the large rope be made fast at the mast-head, between the cap and the top of one of the lower masts, and the tailed block a little distance below it; but, if the masts should have been cut or carried away, then it must be made fast to the loftiest remaining part of the wreck. When this is done, there will be supplied from the shore a cot, hammock, netting, basket, hoop, or any of the numerous resources of seamen, which will run on the larger rope, and be worked by the people on shore. If a cot be used, the men may be so securely fastened to it as to preclude all possibility of falling out, and then be brought from the wreck, one by one, in perfect safety."

"While communication is gaining, three stakes should

be driven into the ground in a triangular position, so as to meet close at the heads to support each other. As soon as communication has been effected by the crew of the vessel, and they have secured the line attached to the shot, made fast to these stakes, the crew will haul on board by it a large rope and a tailed block, through which a smaller rope is to be rove, both ends of which (the smaller rope) are to be kept on shore. When they have secured these on board, and the larger rope is rove through the rollers, let a gun-tackle purchase be lashed to it, then lash the purchase to the stakes. By the means of the purchase the larger rope may be kept at a fit degree of tension; for, if care be taken to slacken the purchase as the ship rolls out to sea, the danger of the rope being broken will be guarded against; and, on the other hand, if the purchase be gathered in as the ship rolls toward the shore, the slackness of the rope, which would prevent the cot (fig. 11) traversing as it ought to do, and plunge it in the water more than it otherwise would, will be avoided."

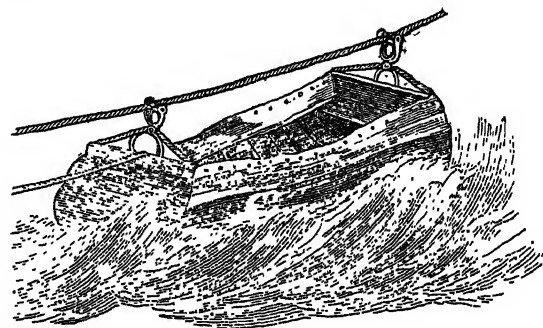


Fig. 11.

"Supposing neither boat nor cot apparatus at hand, first cast off the shot from the projected rope, and with a close hitch, let it be put over the head and shoulders of the person to be saved, bringing it close under each arm, drawing it tight, *observing particularly the knot is on the breastbone*; for, by having the knot in that position, on the people of the shore hauling the person from the wreck, he will naturally be on his back, consequently, the face will be uppermost to seize every moment for respiration, after each surf has passed over the body. If circumstances compel recourse to this method, care must be taken to free the rope from any part of the wreck, and to jump clear away; but should there be more than one on board, each man should make himself fast in the same way, about four feet from the other, and join hands, all attending to the same directions."

"For giving Relief to Vessels Stranded on a Lee Shore in a Dark and Tempestuous Night.—It will be requisite, first, to devise the means of discovering precisely where the distressed vessel lies, when the crew are not able to make their situation known by luminous signals; secondly, to produce a method of laying the mortar for the object, with as much accuracy as in the light; thirdly, to render the flight of the rope perfectly distinguishable to those who project it, and to the crew on board of the vessel, so that they cannot fail of seeing on what part of the rigging it lodges, and consequently have no difficulty in securing it."

"To attain the first object, a hollow ball was made to the size of the piece, composed of layers of pasted cartridge paper of the thickness of half an inch, having a lid on the top to contain a fuze (fig. 12), and it was then filled with about fifty luminous balls of star composition, and a sufficient quantity of gunpowder to burst the ball and inflame the stars. The fuze fixed in the ball was graduated, to set fire to the bursting powder at the height of 300 yards. Through the head of the fuze were drilled



Fig. 12

Life-Pre-
servers.

holes, at equal [distances], to pass through them strands of quick match, to prevent the possibility of any accident from the match falling out, or from its not firing the fuze. On the stars being released, they continued their splendour, while falling, for near one minute, which allow ample time to discover the situation of the distressed vessel. During the period of the light, a stand, with two upright sticks (fig. 13), (painted white, to render them more discernible in the dark), was ready at hand, and pointed in a direct line to the vessel.

"A shell affixed to the rope, having four holes in it to receive a like number of fuzes (headed as before described), and filled with the fiercest and most glaring composition, which, when inflamed at the discharge of the piece, displayed so splendid an illumination of the rope, that its flight could not be mistaken."

"To get a Boat from a Beach over the Surf.—The importance of going to the relief of ships in distress at a distance from the land, or for taking off pilots, was viewed as of the highest consequence by the elder brethren of the Trinity House, and offered to my particular attention by several distinguished characters. After numerous experiments to accomplish it in various ways, the mode following was most approved:—About forty fathoms of $2\frac{1}{2}$ -inch rope, made fast to two moving anchors, was laid out parallel with the shore, at a distance beyond the sweep of the surf; to the centre of this rope was made fast a buoy, of sufficient power to suspend the great rope, and prevent it from chafing on the sand, rock, or stones, as well as embedding, a circumstance that has rendered it impossible, on a sandy or shingly coast, to heave out an anchor with a rope to it from the shore. As this service should be performed in fair weather (to be prepared for the storm), it may be regulated with the greatest exactness, and should take place at the top of high-water, that the upper part of the buoy may be at the full stretch of its power, and only seen at that time. Should the shore be extremely flat, it will be desirable to place another set at a sufficient distance beyond the first, to insure the operation of this method in any state of the tide.

"The royal mortar being brought to the spot, is to be pointed in the direction for the buoy, and should be laid at a very low elevation, but such as to insure the range; for the more it is depressed, the less slack of rope there will be from the parabola formed in the shot's flight; the basket with the rope ready laid (having a barbed shot to it) is to be placed in the front of the mortar; on its being fixed, instantly haul the slack of the rope in, to prevent the

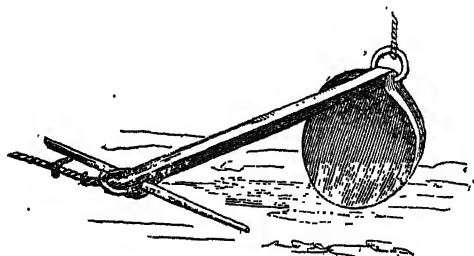


Fig. 14.

effect produced on it by a strong tide; which being done, let the remainder be gently hauled in, to insure the shot's

grappling with the great rope; when that is caught and hooked, a power will be acquired fully adequate to the service.

"As a cast-iron anchor appears particularly adapted to this method, and would be much cheaper than hammered, fig. 14 is a plan of one which the Honourable the Navy Board approved, and allowed me to cast at their expense, for the purpose of making the experiment."

"When a vessel is in that extreme and perilous situation, driven under a rugged and inaccessible cliff, and in danger of going soon to pieces, the most prompt method I should suggest is, by lowering to the crew a rope with stiff loops spliced into it (fig. 15), at the distance of a foot and a half from each loop, of sufficient size to contain the foot, by which they can ascend as a ladder.

"This rope-ladder is capable of being projected; and one of an inch and half rope was thrown from a mortar 194 yards. It might also, from the simplicity of its structure, be extremely useful in escaping from a house on fire. By making one end fast to the leg of a bed or a table, the person would come down from the window in safety, and with much less difficulty, and quicker, than with the common rope-ladder, which is heavier and more unwieldy. It has great advantages when employed in saving shipwrecked men in situations just described, when, from extreme cold, and almost benumbed limbs, it would be impossible for them to climb up a rock, or ascend it even by the aid of a common rope. The holds, thus spliced in, will support both hands and feet."

Fig. 15



The Report of the Committee of the House of Commons contains also a paper of instructions for the managers of Captain Manby's apparatus on shore, which are somewhat more minute than the directions published in his Essay. For example:—

"If the wind be sideways to the shore, the mortar must be pointed sufficiently to windwards to allow for the slack of the rope lighting on the object, as the rope will, of course, be borne considerably to leeward by the effect of a strong wind.

"The distance your judgment decides the vessel to be from the shore should regulate the charge of powder as stated in the scale, taking just a sufficient quantity to clear the object: an attention to this will be more certain of your effecting communication, and guarding against the danger of the rope breaking, or any other circumstance that might prevent the successful performance of the service. The elevation of fifteen degrees is to be preferred, particularly if the wind is sideways, pointing the mortar sufficiently to windward, as the rope would then fall against the weather-most part of the rigging of the stranded vessel.

"When a vessel is driven on shore in the night, you will flash gunpowder as often as convenient on your way; this will animate the crew, and denote to them you are coming to their assistance. On getting to the spot where you have reason to suspect the vessel lies, as you are not able to discover her from the extreme darkness, and if the people on board cannot [make known] their situation by luminous signals or noises (which they will be directed to make if possible), you will lay the mortar at a very high elevation, and fire a light ball.

"Just before you fire (the rope) it would be advisable to let off a blue light to put the crew on their guard, to look out, and be ready to secure the rope. The service can be performed with a carronade."

In chap. iv. we have a copy of directions to persons on board vessels stranded on a lee-shore, proposed to be delivered to the masters at the custom-house. It is observed, that even snapping a pistol, when the powder is wet, may sometimes afford a signal visible on shore, from the sparks

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servers.

of the steel alone. The other parts of the directions will be supplied by those who understand the principles of the proposed mode of relief.

Rockets have of late years been much employed instead of the mortar, in Manby's apparatus for throwing a line to a ship in distress. "Dennett's Rocket Apparatus" is supplied to many stations along the coast. The only advantage which the rocket has over the mortar is its greater portability; for, being much lighter, it can be used with greater facility amongst rocky cliffs, and in positions difficult of access. The disadvantages of rockets are, that they are somewhat uncertain, sometimes exploding as soon as ignited, to the danger of the bystanders; and they are also liable to deteriorate from the effects of damp or of age. Moreover, being expensive, they cannot be often employed in trials, so as to keep up the practice of the people employed in using them. The range of a shot from a 24-lb. mortar, which is the ordinary size, is about the same as that of a 12-lb. rocket, which is the largest in use. As the management of the mortar and rocket apparatus is much better understood by the officers and men of the coast-guard service than by ordinary boatmen and fishermen, it has been almost entirely left in their hands, and is provided by the Board of Customs. There are in England 132 mortar and rocket stations; in Scotland, 15; in Ireland, 22.

Several inventions, or variations, in the Manby apparatus may be just glanced at. M. G. Delvigne uses a howitzer instead of a mortar, while a portion of the line to be carried is contained in the projectile. Mr Greener has a method of discharging a rocket, with a line attached, from a light harpoon gun. When discharged, the rocket ignites, and is said to prolong the range to a greater distance than if the gun or the rocket were alone employed. Captain Jerningham, R.N., has an anchor of a particular form, which he proposes to fire from a Manby's mortar, in sufficient numbers to afford the means of hauling a life-boat through the surf. Mr A. G. Carte employs a war-rocket instead of a Dennett's rocket.

Life-boat.

The last description of the inventions to be considered, with regard to the preservation of lives in cases of shipwreck, is that of life-boats, which are of such a construction as to be incapable of sinking, even when filled with water. The occasional adaptation of the common boats of the ship to such purposes, by means of empty casks, has been already noticed. But the boats now in question are supposed to be kept on shore at proper stations, and manned by active persons, who are in the habit of exerting themselves for the relief of seamen in distress.

Mr Henry Greathead, of South Shields, received a gold medal and fifty guineas from the Society of Arts, in 1802, and a parliamentary reward of L.1200, besides further remunerations from the Trinity House, and from Lloyd's Coffee-House, for his invention of a life-boat, which is described in the *Transactions of the Society*, vol. xx., p. 283. The length of this boat is 30 feet, its breadth 10, and its greatest depth about 3, besides a general curvature, which nearly doubles the depth, as reckoned from the ends; the convexity below being intended to give it a greater facility of turning, and a greater power of mounting on the waves without submersion of the bow, which would increase the resistance, though it would not sink the boat; the breadth is also continued further than usual fore and aft, in order

to contribute to the same property. The gunwale projects some inches, and the sides below it are cased with pieces of cork, amounting in the whole to 7 cwt., which are secured by plates of copper. There are ten short oars of fir, fixed on pins to the gunwales, and a longer oar for steering at each end, both ends of the boat being alike. It is painted white, in order to be more conspicuous; and a carriage is provided, for conveying it overland when required. The description is accompanied by documents of the preservation of 200 or 300 men by the boats of South Shields and North Shields, which were built in 1789 and 1798 respectively.

Mr Christopher Wilson received a gold medal in 1807, for a life-boat with air gunwales, which was tried at Newhaven, and was said to be lighter and more manageable than Mr Greathead's. (*Transactions*, xxv. 55.)

"Little is required," says Captain Manby, "to establish the importance and advantages that will result from giving every boat the properties of a life-boat, particularly when taken into consideration that it can be produced at a very trifling expense."

To illustrate the method of giving the properties of preservation to any boat,—a man of war's jolly boat, for example,—we quote the description of the one which was fitted up to make experiments thereon, by permission of the Honourable Commissioners of the Navy Board.

"To give it buoyancy, empty casks were well lashed and secured in it. For the advantage of keeping it in an upright position, launching from a flat shore, beaching, and to resist upsetting, it had billage boards of equal depth with the keel, and when a good sized piece of iron or lead was let into or made fast to the keel, if any accident did upset the boat, it immediately regained its original posture. A stout projecting rope, with swellings upon it to increase its elasticity, surrounded the gunwale, served as a fender, and prevented it being stoved in lowering down, or when driven in contact with the vessel it might be going to relieve.

"The boat thus described had the plug out, and was filled with water until it ran over the gunwale, when a crew of four, with myself, tried it in every way, and found, from the buoyant property of the casks, it kept the boat so much above the water's edge, that it was rowed with the greatest ease, and was capable of performing any service required."

Mr J. Boyce, in 1814, obtained a medal for his life-boat and safety-buoy, consisting of hollow cylinders made of canvas painted and varnished, and connected with each other. It was tried on a river, and carried a man with safety (*Trans.* xxxii. 177): but surely it could not be trusted among breakers on a lee shore. In 1818 Mr Gabriel Bray obtained a silver medal for his invention of a boat filled with air-boxes under the seats and along the sides. (Vol. xxxv., p. 172.)

Of late years the subject of life-boats has attracted considerable attention, from the circumstance of the increasing number of wrecks, consequent on the rocky nature of our shore, and the vast and increasing amount of our commerce. The exertions, too, of the National Life-Boat Institution¹ have had a powerful influence in directing attention to this subject. The attention of the public is also kept alive by the publication of a journal entitled *The Life-Boat*, which, in addition to statistical returns of shipwrecks, contains information on every subject connected with the preservation of life from shipwreck. One of the publications of the so-

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¹ This society, founded in 1824, is under the patronage of her Majesty, and the presidency of his Grace the Duke of Northumberland. The object is to assist every wrecked person in the kingdom, by such means as the establishment of life-boats and rocket-mortars at all the dangerous parts of the coast; to assist in the formation of local committees at the chief ports; to confer rewards in the form of medals, votes of thanks, or pecuniary remuneration to all persons risking their lives for the sake of others; and also to encourage the invention of new or improved life-boats, belts, rocket apparatus, buoys, and other means of saving life. This admirable society is dependent on voluntary subscriptions for its existence and support. That the society has worked with some success, may be judged of from the fact, that since its establishment it has been instrumental in saving the lives of 9682 persons; it has granted 79 gold medals, and 556 silver medals, besides pecuniary rewards, amounting to L.9631.

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ciety is a *Wreck Chart of the British Islands*, originally published by the Admiralty. A vessel wrecked on our coasts is indicated by a black spot ●, while a vessel so seriously damaged as to require to discharge her cargo is indicated by +; and the number of such marks at any one spot indicates the annual average of wrecks, which may be large because the coast is dangerous, or because the traffic is great. Thus, the mouth of the Tyne shows a larger number of black dots and crosses than any other place; the mouth of the Tees and the mouth of the Weir occupy the next places of distinction in this dismal chart: these three rivers being the outlets of the district by which London is supplied by sea with three million tons of coal every year, giving employment to several thousand collier ships, which sail to and fro, and greatly add to the otherwise large trade of the Northumberland and Durham ports. The coast of these two counties indicates per annum 180 wrecks, sinkings, and serious collisions. The mouth of the Humber, the coast of Suffolk between Yarmouth and Southwold, the sandy shoals off the mouth of the Thames, the Goodwin Sands, the Scilly Isles, Barnstable Bay, and Liverpool, rank as the next dangerous portions of the English coast. The Welsh coast is also dangerous, especially Glamorgan, Pembroke, and Anglesea. Scotland, except near the Firth of Forth, is comparatively free from wrecks, the western coast remarkably so, probably from being less exposed to the winds, which tend to drive ships ashore on the eastern coast. In Ireland the E. and S. coasts present about an equal number of wrecks, the smaller number being on the northern and western. In the year 1855 no less than 1141 wrecks occurred on the coasts of the United Kingdom, about one-half of that number belonging to the E. coasts of Great Britain. The loss of life from shipwreck during that year was comparatively small, being only 469, or less than one-third of the loss of the preceding year, the average loss per annum being between 600 and 700 lives.

Passing over a great variety of proposals for life-boats, we proceed to notice the boat which the Life-Boat Institution recommends and supplies to its stations. Its history is interesting. A few years ago, a lamentable accident occurred to a South Shields life-boat, whereby twenty pilots were drowned. This induced the Duke of Northumberland to offer a reward for the best model of a life-boat. This offer was responded to by boat-builders and others from various

parts of the kingdom, as well as from France, Holland, Germany, and America, so that 280 models and plans were sent in. About fifty of the best of these were exhibited by his grace in the Great Exhibition of 1851; and he expressed his intention of placing the best life-boats, with their subsidiary apparatus, on all the exposed points of the coast of Northumberland. He also caused a report to be prepared, accompanied by plans and drawings, with a view to elicit the best form of life-boat; for although the prize of L.100 was assigned to Mr Beeching of Great Yarmouth, it was considered that a better boat might still be produced. Accordingly, Mr James Peake, assistant master-shipwright in H.M. Dockyard at Woolwich, and a member of the Life-Boat Committee appointed by the Duke of Northumberland, was requested to furnish a design for a life-boat which might combine as many as possible of the advantages, and have as few as possible of the defects, of the best of the models examined by the committee. A boat was accordingly designed by Mr Peake, and built at the public expense in Woolwich Dockyard. Some modifications were from time to time made in her, in consequence of various experiments, and a trial of her capabilities made in a gale of wind at Brighton. The boat, with others of the same design, built at the cost of the Duke of Northumberland, was placed on the Northumberland coast in the autumn of 1852. In the course of the following winter these boats were taken afloat on trial by the Society's inspector of life-boats, some of them in heavy seas and gales of wind, and the result of the trials was considered to be highly satisfactory. Other boats were therefore built on the same plan, and we may therefore consider this as the model life-boat. These boats have been for the most part of two sizes, viz., 27 and 30 feet in length, with $7\frac{1}{2}$ to 8 feet beam, and rowing from eight to twelve oars, double-banked; their weight averaging two tons. But as such boats have been found too heavy to be managed in some localities, where boatmen are few, boats of less beam and weight, rowing six oars single-banked, but on the same design in other respects, have been built under the denomination of second-class life-boats. The former class of boats have also been somewhat modified since the description of the boat was first published, so as to be reduced somewhat in beam, and to have less height, and greater sharpness of bow and stern, to enable them to be rowed with greater speed against a head gale and a heavy

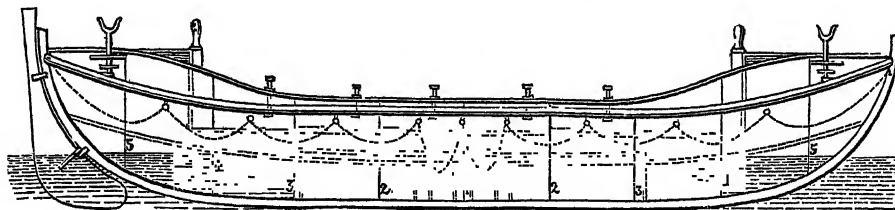
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Fig. 16.

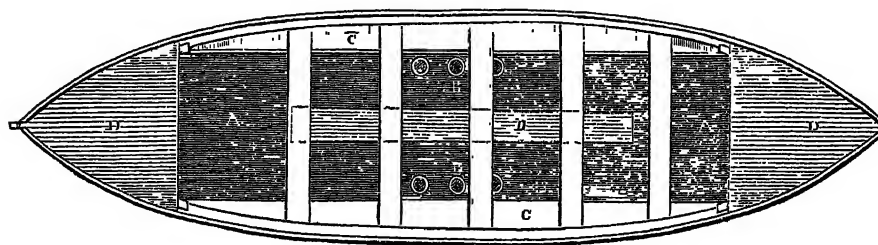


Fig. 17.

sea. They are also built of fir, upon the diagonal principle of double planking without timbers, whereas the earlier

boats were of elm, and clenched, or clinker-built.

The accompanying figures show the general form and the

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nature of the fittings and air-chambers of one of these boats, 30 feet in length, and 7 feet 6 inches in breadth. In figs. 16 and 17, corresponding to the elevation and deck-plans, the general exterior form of the boat is seen, showing the sheer of gunwale, length of keel, and rake, or slope of stem and stern posts. The dotted lines of fig. 16 show the position and dimensions of the air-chambers within board, and of the relieving tubes. A represents the deck, B the relieving tubes, 6 inches in diameter, C the side air-cases, D the end air-chambers. In fig. 18 the exterior form of transverse sections, at different distances, from stem to stern is shown. Fig. 19 represents a mid-ship transverse section, A being sections of the side air-cases, B the relieving tubes, bored through solid massive chocks of wood of the same depth as the space between the deck and the boat's floor; C, C are spaces beneath the deck filled up, over 6 feet in length, at the mid-ship part of the boat, with solid chocks of light wood, or boxes of cork, forming a portion of the ballast; D is a section of a tier below the deck, with a moveable hatch or lid, in which the boat's cable is stowed, and into which all leakage beneath the deck is drained through small holes with valves fixed in them. In some of the later boats a small draining tier only is placed, having a pump in it, by which any leakage

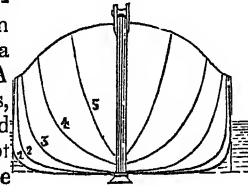


Fig. 18.

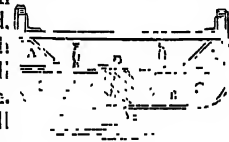


Fig. 19.

can be pumped out by one of the crew whilst afloat. The festooned lines in fig. 16 represent exterior life-lines, attached round the entire length of the boat, to which persons in the water may cling until they can be got into the boat; the two central lines are festooned lower than the others, to be used as stirrups, so that a person in the water by stepping on them may climb into the boat.

The chief peculiarity of a life-boat is its incapability of being sunk, in consequence of its being fitted with water-tight air-cases, or compartments. One of the difficulties of life-boats has been to decide as to the amount and distribution of such air-cases. The necessary space for rowing and working the boat, and for the stowage of shipwrecked persons being secured, the spare space along the sides within-board should be entirely occupied by buoyant cases, or compartments, because, on the boat's shipping a sea, the water, until got rid of, is confined to the midship parts of the boat, where it serves to a great extent as ballast, instead of falling over to the lee-side, and destroying the equilibrium of the boat. Hence, barrels or casks, which do not conform in shape to the sides of the boat, are not well adapted to serve as air-cases. In Mr Peake's life-boat there is a water-tight deck at the load-water-line, and detached air-boxes along the sides, closely conforming to their shape from the thwarts to the deck. Extra buoyancy is also derived from large end air-cases, built across the bow and stern, and occupying from 3 feet to 4½ feet in length, from the stem and stern posts to gunwale height. These cases are chiefly intended to provide self-righting power; but in the event of the boat being stove in, and the space below the deck being filled with water, these air-cases alone have sufficient buoyancy to float the boat.

The second peculiarity of a life-boat is its power of discharging, in a few seconds, any water which may be shipped by the breaking over of the sea, or by the boat being suddenly thrown on her beam-ends. This property does not belong to all life-boats, for, in certain cases (the Norfolk life-boats, for example), the plugs which stop up certain holes in the floors are taken out during a gale of wind, or a heavy sea, so as to let the water into them until it is

at the level of the sea. The water thus let in is confined by the wide side-cases to the mid-ships of the boat, where it serves as a loose ballast, and the boatmen consider that it is safest to go off under sail with the boat deeply immersed. The Liverpool life-boats have no relieving holes, so that when filled by a sea, the water must be got rid of by baling. In Mr Peake's boats there is a water-tight deck at the load-water-line, and a number of large open tubes, opening at the surface of the deck, and passing through the space between the deck and the floor; the bottom orifices being furnished with self-acting valves opening downwards, so as to allow any water shipped to escape through them. The deck being placed at or above the load-water-line, any water which is above it will be above the outside level of the sea, so that the water escapes from the deck by its own weight, and disappears in a few seconds.

As a life-boat has very great buoyant power, it is important to her stability and safety to attend to the ballasting. The Greathead life-boats have usually no ballast, their great breadth of beam being relied on for stability; but some of them have a tank in the midships beneath the deck which can be filled with water. Beeching's life-boats are similarly ballasted; but accidents, with loss of life, have arisen from a difficulty in filling the tanks, and preventing the escape of the water when full; hence solid ballast is to be preferred. Mr Peake's life-boats are ballasted with heavy iron keels, and with solid wood and cork ballast, stowed under the decks; and should these be stove in, and the space beneath be filled with water, the wood and the cork would supply extra buoyancy.

A life-boat ought to be self-righting if upset, a property which, however, belongs only to Mr Peake's and Mr Beeching's boats, some boat-builders considering that stability is sacrificed thereby. The fact, however, has been established in the *Life-Boat Journal*, that the means employed to produce self-righting add to the stability of a boat, and improve her in other respects. The self-righting power is thus attained;—“1st. The boat is built with considerable sheer of gunwale, the bow and stern being from 1 ft. 6 in. to 2 ft. higher than the sides of the boat at her centre, and the space within the boat at either extremity, to the distance of from 3 to 4½ ft. from the stem and stern posts to gunwale height, is then inclosed by a sectional bulk-head and a ceiling, and so converted into a water-tight air-chamber, the cubical contents of which, from the thwarts upwards, are sufficient to bear the whole weight of the boat when she is placed in the water in an inverted position, or keel upwards. 2d. A heavy iron keel (from 4 to 8 cwt.), is attached, and a nearly equal weight of light wood or cork ballast is stowed betwixt the boat's floor and the deck. No other measures are necessary to be taken in order to effect the self-righting power. When the boat is forcibly placed in the water with her keel upwards, she is floated unsteadily on the two air-chambers at bow and stern; whilst the heavy iron keel and other ballast being then carried above the centre of gravity, an unstable equilibrium is at once effected, and the weight of the iron keel falling over on one side, immediately restores the boat to her proper position; in other words, she self-rights” (*The Life-Boat*, No. 22).

Lateral stability or stiffness, being the tendency to preserve an upright position in the water, with proportionate resistance to upsetting, is obtained by breadth of beam or by ballast—as in Mr Peake's boats, by an iron keel and other solid ballast, and by flatness and length of floor, with moderate beam only. The other qualities to be required in a good life-boat are speed, strength, and stowage-room, all of which seem to have been well-considered in Mr Peake's boats.

A new description of life-boat, invented by the Rev. E. L. Berthon, M.A., of Fareham, and known as the Fareham Life-boat, has been made the subject of a patent. Its novel feature is, that it is collapsible, so that it combines the pro-

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servers.

perty of the life-boat, with facility of stowage in a small space. Hence, it is well adapted for the use of ships, especially large steamers, emigrant vessels, and troop-ships. Its frame-work is of wood, all the timbers extending the whole length of the boat, there being no transverse timbers or ribs. The timbers, four on each side of the stem and keel-piece, are thin, flat, and deep, something like a thin slice of melon; they are made without scarfing, by bending plank over plank till the required thickness is attained. They are jointed together at their ends, and to the tops of the stem and stern posts by a kind of chain hinge. When the boat is collapsed, these timbers stand side by side in vertical planes, like the leaves of a closed book; but when expanded, they stand apart in radial planes, somewhat like the segments of an orange. Attached to the edges of all the timbers are the water-proof coverings, of which there are two, the outer skin being secured to the outer edges, and the inner skin to the inner edges of the timbers, by which means the whole body of the boat is divided into eight separate longitudinal cells or compartments, which become filled with air on expanding the boat. This is effected and maintained by the bottom boards and thwarts, which being jointed along the middle line, are made to stand up at an acute angle when the boat is collapsed, and fall down to straight lines when open. The inventor compares the principle of extension to that of a carriage-head, the frame of which may be compared to the boat's timbers, and the joints to the thwarts and stretchers of the bottom boards; and as the leathern covering of the carriage shuts in when the head is down, so the coverings of the boat shut in between the timbers. The boat has rather a deep keel, besides two bilge pieces on each side, and in every other salient point the covering is protected by wood or copper. The boat is lowered by the following contrivance:—Inside the bulwarks is a large, flat, deeply-grooved sheave about 2 ft. 6 in. in diameter; it has two deep, narrow grooves cut nearly to its axis, and in these are wound separately the ends of the two falls. From this sheave is a projection on which a friction-strap with a powerful lever is made to work. This being placed flat against the bulwarks, the falls are brought to it fore and aft by small sheaves set in the top-rail: thus the friction of the strap when the boat is up is enough to prevent motion; but by slacking the lanyard by which the lever is secured, it may be allowed to descend rapidly or slowly, according to the pressure applied to the break. Rising and falling derricks are substituted for davits.

The average size of the Fareham life-boat is 32 by 10 ft., it has eight thwarts, besides seats round the stern, and will pull, if required, twelve oars double-banked.

Captain Manby's proposal for throwing ropes from ship to ship in cases of accidents may easily be understood from the methods which he employs for saving lives in shipwrecks. The life-buoy for Lieutenant Cook, R.N. F.R.S., Professor of Fortification at Addiscombe College, is related to the same class of inventions; its object is to preserve the life of a person falling overboard in the night, by means of a floating light; and it obtained him a gold medal from the Society of Arts in 1818. (*Transactions*, xxxvi., p. 121.) He observes that a ship may often have to run half a mile before she can get about and lower a boat, so that it becomes highly desirable to afford a temporary support to the sufferer. The machine consists of two copper spherical air-vessels, with a square tapering tube through each, made water-tight, and united together by a cross piece of wood, in which are two brass conducting tubes through which is fixed a perpendicular tubular-staff, with a brass ferule at each end, and a copper sliding rod, nearly its own length, within it. Attached to the lower end of the rod is a flat circular balance-weight, bearing a chain by which the life-buoy is suspended, and a link which, when hooked to a stud

in the lower ferule, bears up the rod and the balance-weight, but which, when unhooked, allows the weight to draw the rod about two-thirds out of the staff. To the head of the perpendicular staff is attached at night a fuse, on a brass fuse-plate, the shank of which is secured into a socket by a thumb-screw. The buoy is secured to the ship by the chain only, the ring of which hangs on the hook of the sheave of the trigger-plate. Attached to the stern of the vessel are two iron rods cased with copper tubing, together with the screw-bolts, from which they are suspended; just above the forked stay which keeps the rods parallel, at a proper distance from the stern, is the trigger-plate, and the brass fuse-case which covers and protects the fuse on the head of the staff. There is also a brass case for the lock or percussion hammer, placed so as to communicate with the fuse-case, by means of the horizontal tube; all these, together with the pulleys and guard-iron are, firmly attached to the stern of the vessel, inside of which, immediately opposite to the pulleys, are fixed the cups and handles, the one for firing the lock and lighting the fuse, the other for raising the trigger-bolt and disengaging the buoy from the ship. As soon as the trigger-bolt is raised, the sheave revolves, the stop turns round, and the life-buoy slides off the rods into the water, bearing on the head of the staff a brilliant flame. The balance-weight, when no longer held up by the chain, drops upwards of 3 feet below the cross-piece, prevents the buoy from upsetting, and affords a place for the man to stand on. This apparatus admits of being lighted and let down into the water in the short space of five seconds. Lieutenant Cook is also the inventor of a plan for converting boats used for ordinary purposes into life-boats at pleasure.

Mr Miller's safety-poles for skaters, and Mr Prior's mode of preventing accidents in descending mines, are mentioned in the *Transactions of the Society of Arts* (vols. xxxii. and xxxvi.) Apparatus of the latter kind has been introduced at different times with various modifications. In coal-pits, or coal and iron pits, where the men are raised and lowered in a rectangular iron frame called a cage, the rope or chain may break, or the cage may be overwound by drawing it over the framing at the pit's mouth. Mr Robert Blee of Redruth has introduced what he calls a safety-bucket, and Messrs White and Grant of Glasgow have a safety-cage. These inventions depend upon some such arrangements as the following:—Two pairs of eccentrics are attached to the ends of two parallel shafts, which extend across the top of the cage; the edges of the eccentrics are toothed, and when the cage is in motion they are free of the vertical wooden rails which steady the cage in its motion up and down the pit. Should the rope break, two volute springs bring round the thick sides of the eccentrics to bear against the guides, and hold the cage securely. To prevent over-winding, the holdfast which connects the rope to the cage is secured by a curved bolt, kept in place by a strong spring; this bolt moves on a fulcrum, and is continued as a lever beyond the holdfast; across the framing at the mouth of the pit is a bar so arranged that, when the lever comes in contact with it, the bolt becomes disengaged, the cage by the action of the eccentrics becomes fixed, and the rope only is drawn up over the pulley. In Mr Blee's safety-cage the catches allow it to move freely so long as there is a vertical strain on them; but should this cease by the breaking of the rope, the catches become liberated and attached to the iron staves of the ladders placed on either side of the shaft.

A sketch of the expedients which have been recommended for the preservation of mariners, published in a work entitled *Shipwrecks and Disasters at Sea* (vol. iii., p. 459, Edinb. 1822, 8vo), contains a few further historical details relating to some of the inventions which have been described.

(T. Y.) (C. T.)

Life-Pre-
servers.

L I G H T.

Light.

SECT. I.—HISTORY OF THE SUBJECT.

THE nature and properties of the agent on which vision depends have been objects of philosophical disquisition from ancient times. The earliest speculations which have reached us on this subject are those of Pythagoras, who considered vision as produced by particles continually emanating from the surfaces of bodies, and entering the pupil of the eye. The Platonists, on the other hand, conceived that vision was the consequence of the emission of something from the eye meeting with certain emanations from the surfaces of things; yet, with this very gratuitous hypothesis, they appear to have detected several properties of LIGHT, especially its propagation in right lines, and the equality of the angles of incidence and reflection when it falls on bright and polished surfaces. The effects of the concentration of the sun's rays by concave specula were certainly known to the ancients. Antiquaries have accordingly supposed, that, in this manner, the Romans kindled their *sacred fire*; and thus also it has been alleged that Archimedes destroyed the Roman fleet at the siege of Syracuse.

Aristotle regarded light but as a mere quality of matter; and he has some ingenious speculations on the rainbow, and on other luminous meteors. Ptolemy the geographer wrote a treatise on optics, which has perished; but, from some fragments preserved by other authors, he appears to have had distinct ideas on the subject of atmospherical refraction.

A long interval of darkness succeeded his era of speculation, until the Arabians began to cultivate the learning of the Greeks, and several of their philosophers treated of optics. But the earliest Arabian work which has reached our times, is the celebrated treatise of Alhazen. In it we find a description of the eye, and of the uses of its different parts. The author details many experiments on refraction, both as exhibited in the atmosphere, and as regards the modifications of light in passing from one medium to another of different density. He likewise notices the magnifying power of segments of spheres of glass; a hint from which it has been supposed that the important invention of *spectacles* originated. We also owe to him the idea that single vision, with two eyes, is produced by images painted on corresponding points in each retina; and that stars may be seen by refraction, when they are actually below the horizon; remarkable speculations for the twelfth century.

The work of Alhazen was in 1270 commented on by Vitellio, a native of Poland, who added a considerable number of observations on the refractive power of air, water, and glass, which he reduced into a tabular form. He made some ingenious attempts to explain the phenomena of refraction; and he seems to have conceived the true idea of burning lenses.

Roger Bacon, the contemporary of Vitellio, was undoubtedly acquainted with the magnifying property of segments of spheres, and recommended that small segments should be preferred for such purpose; adding, *et ideo hoc instrumentum est utile senibus et habentibus oculos debiles*. This so plainly indicates the invention of spectacles, that we cannot doubt that it had then been made. We know that they became common in the thirteenth century, and are described by Spina of Pisa in 1313, although we have no absolute certainty as to the person who first constructed them.

After the revival of letters, one of the earliest cultivators of mathematics was Maurolycus of Messina, who made

optics his study. He proved that the crystalline lens of the eyes of animals converges the rays of light which enter that organ, and transmits them to the retina, in or near which the foci of the lenses are situated. Hence also he inferred, that in persons who are *short sighted*, the defect is owing to the too sudden convergence of the pencil of rays before the retina; and that in those who are *long sighted*, the foci are placed behind that expansion of the optic nerve. Maurolycus, however, did not discover that the images of objects are painted on the retina.

Baptista Porta, the author of *Magia Naturalis*, a Neapolitan of rank, was much addicted to philosophic research; to him we owe the first description of the camera obscura, and its application to the delineation of objects. His work contains many observations on light, some of which are accurate; and though some are now found to be erroneous, his remarks are always ingenious. This subject also engaged the attention of Lord Bacon, who complained that the *form* and *origin* of light had been too much neglected; but his labours in other branches of philosophy diverted his powerful mind to different objects.

The true theory of the rainbow was first given by Antonio, bishop of Spalatro, although he could not satisfactorily explain the cause of the colours.

The next optical discovery of importance was the *telescope*, for which we are indebted to Zacchias Jansen, a spectacle-maker of Middleburg, in Walcheren, in 1590; and this important invention was quickly applied by Galileo to physical astronomy, with brilliant success, crowned by the discovery of the satellites of Jupiter, the structure of the Via Lactea, the phases of Venus, the ring of Saturn, the spots on the sun's disk, and a knowledge of numerous stars unknown to former observers.

The study of light was improved under the auspices of Kepler, who gave an explication of the effect of lenses on the rays, and suggested the form of the telescope now called *astronomical*. He treated of refraction, and discovered, that when light falls within glass at an angle a little above 42° , it is wholly reflected. But his theory of vision is much more important; for he showed that images of external objects are painted on the retina, and appear there inverted, a fact also ably illustrated by Scheiner. The invention of the compound microscope seems also due to Jansen, and dates from the same period.

Perspective was first scientifically treated by Pietro del Borgo, Baldassare Perussi, and Guido Ubaldo. To the second of these is due the detection of the *distance points*, to which all lines forming an angle of 45° with the *ground line* are drawn; to the third, the convergence of all parallel lines inclined to the ground line, in a point in the *horizontal line*, and also that a line drawn from the eye, parallel to them, will pass through this point. These principles are the foundation of perspective, which afterwards received improvements from 'sGravesande, and were completed by Brooke Taylor. The true law of refraction is undoubtedly due to Willebrod Snell, or Snellius, professor of mathematics at Leyden. He experimentally showed that the co-secants of the angles of incidence and refraction are always in the same ratio. This discovery, we are assured, on the authority of Huygens, was appropriated by Descartes, who had consulted the papers of Snell, but gave it as his own, under a somewhat different form. The successive labours of Descartes, Kircher, Grimaldi, De la Hire, Hooke, and Huygens, gave to the study of optics a profound scientific character; and the interesting discoveries of that century were crowned by the important researches of our immortal

Light.

Light. Newton concerning the optical properties of light. During the last century, our knowledge of this subject has been steadily progressive, by the labours of a multitude of philosophers, so numerous, that we can afford space for little more than to record the names of some of the most successful inquirers into the mysteries of this subtle agent. Amongst these, Mairan, Dufay, Mariotte, Boscovich, Euler, Mitchell, Melville, Canton, Bennet, and Lagrange, stand conspicuous; nor must we omit the important fact, illustrated by the labours of Bradley and Roemer, that the velocity of light, from whatever source derived, whether from the sun, the fixed stars, the planets or their satellites, is equal, or that its velocity before and after reflection is the same; a formidable objection to the theory of emission. During the present century, the progress of discovery in this field has been no less brilliant. Very early in it, Dr Thomas Young illustrated the principle of the *interference of the rays of light*, founded on some facts observed by Grimaldi, but first distinctly stated in Dr Young's Memoir in the Philosophical Transactions for 1803, entitled *Experiments and Calculations relative to Physical Optics*; and his conclusions have been demonstrated beyond all doubt by the researches of Fresnel and of Sir John Herschel. The splendid talents of Laplace, of Poisson, Biot, Arago, Pouillet, Cauchy, Ampère, and Fresnel, amongst continental philosophers, have especially illustrated the phenomena and theory of light; and in our own country, Sir William Herschel, Young, Brewster, the younger Herschel, Airy, and Whewell, have pursued these delicate investigations with singular ability and success. Above all, we must record, as amongst the most signal triumphs of modern science, the detection and explanation of the *polarization of light*, and the singular confirmation thereby afforded of the theory of its propagation by *undulations*. See SIXTH DISSERTATION.

SECT. II.—NATURE OF LIGHT.

Notwithstanding this long list of splendid discoveries, the nature of light is still in some degree enigmatical. It is admitted, that the phenomena of vision depend upon the agency of a subtle, extremely attenuated matter, set in motion by the sun and other luminous bodies. Its materiality is inferred from its deflection from its rectilinear course, in passing near various bodies; from its being arrested by certain substances, though it passes freely through others; from its reflection by polished surfaces; from its capability of condensation and dispersion, in passing through certain media; from its producing chemical changes in certain compounds; and from its apparently entering into the composition of some bodies, from which it may be again extricated.

Thus far the majority of philosophers are agreed; but two opposite theories have been advanced respecting its propagation, and the mode in which it manifests itself to our senses.

Some maintain that light is a peculiar matter, which is projected in all directions from luminous bodies in a rapid succession of material particles. This theory is sustained by the illustrious name of Newton, and has been very generally received; but of late, certain difficulties in the explanation of the recently-discovered properties of light, especially its polarization, have tended to revive the doctrine maintained by Descartes, Huygens, and Euler, viz. that all the phenomena of light depend on the *undulations* of a highly attenuated fluid or ether, universally diffused throughout space, which, while at rest, is inappreciable by our senses, but, when acted on by luminous bodies, is thrown into a succession of waves. Luminous bodies are thus supposed to act on the universally diffused fluid somewhat in the same manner that sonorous bodies do on air in the production of *sound*.

Light. It is true, that all the known facts regarding light may be explained upon either hypothesis. It must be owned, however, that the remarkable coincidence of fact with theory, and the facility of explanation, favour the theory of undulations, whilst it scarcely can be said to involve any greater assumption than the doctrine of direct transmission. Both assume the existence of a subtle fluid; both admit the influence of luminous bodies; and it does not seem more difficult to conceive them acting, by causing an undulation in the *matter of light*, than by projecting it in a rapid succession of particles, the minuteness and velocity of which almost elude the grasp of our imagination.

Whichever hypothesis we adopt, the propagation of light is a process of astonishing rapidity. Astronomers have found, from observations on the eclipses of Jupiter's satellites, that planetary light requires about fourteen minutes to cross the earth's orbit; or, if we adopt the more recent and probably more accurate determination of Bradley, that the light of the sun requires about eight minutes to reach our earth; and, if we reckon the mean distance of the sun to be 94,879,956 English miles, it follows, whether we regard it as an emanation or an undulation, that light must travel with a velocity of about 200,000 miles per second.

It is difficult to form any adequate idea of such enormous velocity; but we may approximate it, by comparing this with the ascertained velocity of a cannon ball. A twenty-four pounder, with the common charge of powder, according to Robins, discharges its ball with an initial velocity equal to 1600 feet per second; yet, if such a ball were to continue this velocity undiminished, it would require about ten years to traverse a space which the light of the heavenly bodies pervades in eight minutes.

This prodigious rate, and the ease with which light can penetrate many solid bodies, have been adduced as arguments against the doctrine of the successive emanation of particles from luminous surfaces; but did not the undulatory theory afford an easier solution of certain recently-discovered properties of light, we should not regard such arguments as conclusive. Now, however, the undulatory theory has been shown to correspond so exactly with known facts, and has even enabled us to predict so exactly what experiment has since confirmed, that it has received the sanction of the greatest names in modern science. See CHROMATICS.

SECT. III.—PROPERTIES OF LIGHT.

Whichever hypothesis be adopted, light must be considered as a material substance, possessed of certain properties, detected by observation and experiment.

1. Light is given out by luminous bodies in all directions, and from every point of the luminous surface. This is proved by its being equally seen from every point of observation.

2. It is divisible into homogeneous, independent portions, like air or water; the smallest portion we can separate is termed a *ray*; and several rays form a *pencil of light*.

3. Light appears to be absorbed by certain bodies, and is again given out by them spontaneously. This property is well seen in the diamond, which, after being exposed to the sun's rays, continues for a short time to shine in the dark. Various artificial *phosphori* do the same, as the Bolognian stone, calcined oyster shells, and the like.

4. All solids give out light when heated between 700° and 800° of Fahrenheit's thermometer, and are then said to be *incandescent*. All liquids that can be heated to that point are luminous, as melted metals; and, if the elasticity of their vapours be repressed, other liquids appear capable of this emission. Gases do not, however, seem to be capable of incandescence, yet the phenomena attending their sudden condensation, when they enter into chemical union,

Light. shows that they contain light. Thus, when a mixture of oxygen and hydrogen is suddenly and strongly compressed, the gases unite to form water, and both light and heat are extricated.

5. Some bodies have the property of arresting the progress of light, and are termed *opaque*; others transmit it, and are said to be *transparent*. Yet probably no substance is either perfectly opaque or perfectly transparent. Thus, gold is one of the most condensed and opaque bodies in nature; yet if we enclose gold leaf between two plates of glass, and examine it by transmitted light, it appears of a decidedly greenish hue, showing the transmission of some light through the metal. On the other hand, the most transparent glass, when viewed in a thick plate, and the most limpid water, when in a deep column, appear greenish.

6. When the rays of light fall obliquely on the surface of all bodies, whether transparent or opaque, solid or fluid, they are more or less reflected. Smooth and shining surfaces reflect most light, but the degree also depends on the nature of the reflecting substance. The reflected rays are returned from the surface at an angle equal to the angle of incidence; and if the reflecting surface be a plane, the parallel rays that fall on it are reflected parallel to each other.

When the rays are reflected from a concave surface, the reflected rays are more inclined to each other than the incident rays; and if that concave surface be the segment of a sphere, the parallel incident rays will converge to a point in the axis of the mirror half way between its surface and the centre of the sphere of which it is a segment; and this point is termed its *principal focus*, or focus of the parallel rays. If the incident rays be *converging*, they will meet the axis between the principal focus and that centre; if the incident rays be *diverging*, they will meet the axis in a point between the principal focus and the surface of the mirror. From the immense distance of the sun, all the incident rays may be considered as parallel; and therefore his rays will be condensed into the principal focus of such a mirror, which will in this instance also be that of greatest heat. This is the principle of burning mirrors. When the incident rays fall on a convex mirror, they are all reflected more divergingly, or are dispersed.

The properties of reflected light form the object of the science of *Catoptrics*. See OPTICS.

We are not, however, to imagine that all the light incident on bright surfaces is reflected. Many curious experiments were made on this subject by M. Bouguer. The quantity of light returned differs with the inclination of the rays to the reflecting surface. It is generally strongest at small angles of incidence; and the difference becomes excessive when the rays impinge on the surface of transparent fluids with different degrees of obliquity. Metals, from their opacity and splendour, form the best reflecting surfaces; but even pure mercury, perhaps the most perfect of reflectors, does not reflect more than three fourths of the whole incident light.

7. When the rays of light fall on transparent bodies, they are differently affected, according to the angle of incidence. When a ray passes from one transparent medium to another, in a direction perpendicular to their touching surfaces, that ray will pass through them in a straight line; but when the ray passes in a direction oblique to their touching surfaces, that ray will be bent, or will form an angle at their junction.

When the density of a medium is uniform, the rays of light traverse it in straight lines; but in a medium varying in density, like columns of liquids, or the atmosphere, in which density increases with the superincumbent pressure, the passage of the rays will form curves.

When a ray passes obliquely from a dense to a rarer medium, it is bent or deflected *from* a line perpendicular to their contiguous surfaces. When passing obliquely from a

rare to a denser medium, they are bent *toward* the perpendicular. In such instances the light is said to be *refracted*. In the first instance, the angle of refraction is always greater than the angle of incidence; in the latter it is always less. The study of the properties of refracted light constitutes the science of *Dioptrics*. (See OPTICS.)

8. The refractive power of different media is unequal; and when the rays of light pass from one medium to another, it may be measured by the ratio between the *sines of the angles of incidence and refraction*; and the number expressing the ratio between the first and the last is the *exponent* or *index* of the refractive power of that substance.

The refractive power of different substances appears to be nearly in the ratio of their density; but with inflammable bodies, or those containing an inflammable principle, the refractive power is in a ratio greater than their density. It was this law which led Newton to his happy conjecture that *water* and the diamond might contain an inflammable principle; speculations which have been verified by modern chemistry. The same opinion as regards the diamond was long before maintained by Boetius de Boodt. He says that unctuous and fiery bodies are easily united, but will not mix with watery substances; and because the diamond readily adheres to resins, which are of a *fiery* nature, and because, like amber, another fiery body, the diamond, when rubbed, attracts light bodies, the diamond itself must be of an inflammable or sulphureous nature; an argument which he considers as confirmed by that gem being "produced in a hot, sulphureous climate." It is obvious that the deduction of Newton differs widely in its principles from the hypothesis of De Boodt; but the latter must be regarded as a curious instance of a true conclusion derived from unsound premises.

9. If a pencil of light be admitted by a small hole in the window-shutter of a darkened room, through a triangular prism of any transparent substance, the white light will be found to undergo a remarkable change. The rays will be separated in the prism; their image will be enlarged; and, if received on a white screen, they will be seen variously coloured. The colours will assume a certain determinate order of juxtaposition; and this appearance has been termed the *prismatic spectrum*. This coloured spectrum will then be seen divided into colours, of which Newton enumerates seven; red, orange, yellow, green, blue, indigo, violet. These, it is evident, may be resolved into red, yellow, and blue; for the boundaries of the colours are not well defined, and the compound colours which lie between these may be considered as made up of the intermixture of contiguous rays. These rays are not in equal proportions in the spectrum. If we consider it as divided into 360°, the red occupies 45°, the orange 27°, the yellow 48°, the green 60°, the blue 60°, the indigo 40°, the violet 80°; and it is worthy of remark, that this division of the scale of colour is a striking approximation to the divisions of a chord that would give the musical intervals of the octave. But as these colours are not bounded by defined lines, but graduate into each other, it is very difficult to determine their relative extent with tolerable precision. The cause of their separation is the difference of their refrangibility by the prism; the red being the least, the violet the most refrangible, that is, turned from the line of the incident pencil of light. The green ray will be found in the centre of the prismatic spectrum; and hence its index of refraction is considered as the mean refraction of the substance of which the prism consists. Newton employed in his experiments prisms of different substances; but he seems to have taken it for granted, that when the mean refraction was the same, the length of the spectrum was also equal, or that the *dispersive power* of the bodies in that case was equal. He considered that prisms and lenses of every kind of glass,

Light.

Light and of all bodies, whether solid or fluid, with the same *mean refraction*, possessed also the same *dispersive power*, or formed spectra proportional to their mean refraction. Hence he was led to conclude that "the improvement of the refracting telescope was desperate." This error has, since his day, been detected; and the principle discovered forms the basis of Dollond's admirable invention of the *achromatic telescope*, in which the error of refraction in one species of glass is ingeniously remedied by a correction derived from the different dispersive power of another kind of glass, so adapted to the first as to form with it one object-glass. The difference in dispersive power has now been ascertained in a considerable number of diaphanous bodies; and tables of this difference have been formed from the observations of many philosophers, particularly of Sir David Brewster. See CHROMATICS.

The illuminating power of the different rays of the spectrum is different. Sir William Herschel found, that with a prism of flint-glass, the greatest illumination is towards the middle of the spectrum; the yellow rays affording most light, whilst the illuminating power, diminishing towards each end of the spectrum, is least in the violet ray. A series of experiments on this subject by Fraunhofer, a late celebrated instrument-maker of Munich, showed, that with the best made prisms, when other light is carefully excluded, the most luminous point is nearer the red than the violet end of the spectrum, in the proportion of one to four; and he states the mean refrangibility to be between the blue and indigo rays. But one of the most curious discoveries of this ingenious inquirer is, that the solar spectrum is traversed by numerous dark lines of unequal thickness, perpendicular to the length of the spectrum, and parallel to one another. These lines require a fine prism for their exhibition, a microscope for their detection, and the exclusion of light, except that of the coloured ray under examination. He counted 590 of these lines in the spectrum; the greatest number of them being towards the most refrangible end of the spectrum.

It is well known that the rays of the sun communicate heat as well as light; but the heating power of the coloured rays is very different. Herschel discovered that the red ray raises the thermometer most; and that the effect diminishes as we approach the other end of the solar spectrum. This is sufficiently striking; but in pursuing his investigations he made another singular discovery, that the point of greatest heat is fully half an inch beyond the red end of the prismatic spectrum. Delicate thermometers were placed in the different rays, and gave the following results:—

In the blue ray in	3 minutes it =	56° F.
Green.....	3	... = 58°
Yellow.....	3	... = 62°
Middle of the red.....	2½	... = 72°
Outer confines of red.....	2½	... = 73° 5'
Half an inch beyond the red.....	2½	... = 79°

These curious experiments were confirmed by Sir Henry Englefield and Sir Humphry Davy. The inference from them is, that light and heat are unequally refracted.

The prisms used by these philosophers appear to have been of flint-glass; but Dr Seebeck has since found that the position of the point of greatest heat varies with the nature of the refracting prism. Seebeck found, as Herschel did, that with flint-glass the greatest heat was beyond the red; with plate-glass, in the middle of the red; with sulphuric acid in a hollow thin glass prism, in the orange; with water, in the yellow. The sun's rays would appear to be still more complex. Early in this century, Ritter of Jena found that the rays of the solar spectrum possessed different chemical powers. He found that the salts of silver became soonest black a little beyond the violet end of the spectrum, a little less so in the violet, and still less so in the

blue; and Seebeck, in repeating the experiments, found that beyond the violet ray muriate of silver became reddish brown; in the blue, bluish gray; and in the yellow it retained its white colour, or at most had a yellowish tint; it became reddish in the red ray, and even when placed beyond it. These changes might have been attributed to the influence of heating or illuminating power, had not the greatest deoxidating effect been observed where the heat and illumination are the least. Dr Wollaston, who observed these facts about the same time with Ritter, considers the sunbeams as compounded of calorific and deoxidating as well as luminous rays, all with different degrees of refrangibility. But if the experiments of Morichini be confirmed, the sunbeams have also the property of magnetizing steel. In the year 1813 he announced this discovery; it was repeated by several persons without success, but Mrs Somerville appears to have succeeded. She covered one half of small sewing needles with paper, in Morichini's method, and exposed the naked half to the violet rays for two hours, when she found that the needle had thus acquired a north pole. The indigo ray produced nearly the same effect, but the effect was feeble in the blue and the green; whilst, though exposed in the orange, yellow, and red, for two successive days, no magnetism was induced. Similar effects followed when one half of the needle was enveloped in white paper, and the other half, exposed to the rays, was covered with blue or green glass, or with silk of those colours.

10. The facts already noticed respecting the bending of the rays toward the perpendicular, when they pass from a rare to a denser medium, lead to the inference that the disposition of the surfaces of the refracting medium must materially influence the direction of the rays of light which enter and pass through. Accordingly, it is found that if one or both surfaces be convex, the rays are bent toward the axis of the medium. If the medium be spherical, or a segment of a sphere, the ray, falling perpendicularly on its centre, will pass straight through; but all those that fall obliquely on the spherical surface will emerge from the medium in a direction inclined to the central ray (which may be considered as the *axis* of the medium), and will cut this axis in some point, which is termed the *refracted focus* of those rays. When the medium has its surfaces forming segments of spheres, it is called a *lens*; and lenses are divided into convex and concave, plano-convex and plano-concave, double convex and double concave, according to the form of their surfaces.

When a lens is nearly or really spherical, optical principles will show, that all the emergent rays will not meet in the same point, and that those farthest from the axis will meet first. But if the lens be a thin segment of a sphere, with one or both of its surfaces convex, this error will not be very conspicuous, and the emergent rays will meet nearly in one *focus*.

When both surfaces of a lens are *concave*, or when one is concave and the other plane, the emergent rays will be bent *from* the axis. The mathematical demonstration of these facts, their application to practical purposes, and to the explanation of natural appearances, belong to OPTICS; to which article attention is directed.

11. Some crystallized bodies have the property of dividing the rays of light which permeate them into two distinct portions, one of which passes in the ordinary direction, whilst the other pencil undergoes an extraordinary refraction, passing at some distance from the other. Hence, when any body is viewed through such a crystal in a certain direction, both sets of rays become apparent by giving a double image of the object. This curious property was first detected by Erasmus Bartholin, in calcareous spar brought from Iceland. But the subject was first philosophically investigated with his usual sagacity by Huygens.

Light. who proved that the property of double refraction was not confined to calcareous spar; and it has, since his time, been shown, that all crystals, the primitive form of which is neither a cube nor a regular octahedron, possess this property. Newton attempted to explain this double refraction; but his explanation was not happy. He ascribed it to an original difference in the rays of light, by which some are refracted in the usual manner, whilst others undergo unusual refraction. Huygens discovered, that when the ray of light was received through the Iceland crystal in any direction but one, it was always divided into two rays of equal intensity; but he remarked with surprise, that when he received the divided rays through a second crystal of Iceland spar, the two portions into which each of them was now subdivided were no longer equally intense; that their relative brightness depended on the position of the second rhomb with regard to the first; and that there were two positions of the second, in which one of the rays vanished altogether. This Newton supposed to depend on the rays having different sides, possessed of different properties, each of which "answers to or sympathizes with that virtue or disposition of the crystal, as the poles of two magnets answer to one another."

This idea was followed up by Malus. He conceived that the molecules of this *modified light* have all their homologous sides in the same direction; and he expressed this modification of light by the term *polarization*, as he compared the effect produced to the influence of a magnet, which directs the poles of a series of needles all to the same side; an hypothesis which Biot modified by supposing that each molecule of light had one *axis*, similarly placed in each, and all turned in one direction, in a polarized ray; whilst the molecules were conceived to have a free motion round such axes, by which they could assume different positions according to the attractions and repulsions they experience at the surface of each new medium they traverse. The term *polarization* is not certainly very happy, and it is to be regretted that one more appropriate and less hypothetical had not been employed.

If the rays, thus divided into two pencils by calc spar, be received by a rhomb of the same substance, whilst the axes of both crystals are in the same direction, no new division of the rays takes place; but if, whilst the first crystal remains at rest, the second be turned round, by the time it has made one eighth of a revolution the rays will be again subdivided, and four images will be produced. By continuing the motion until the crystal has described one fourth of a revolution, the subdivision will again disappear.

Malus discovered that an analogous effect was produced by *reflection*. If a pencil of rays fall on a polished surface of glass at an angle of $35^{\circ} 25'$, it is reflected at any angle equal to the angle of incidence. If we now place another plate of glass in such a position that the rays reflected from the first shall fall on the second also at an angle of $35^{\circ} 25'$, or when the plane of both reflections coincide, the rays will also be reflected from the second plate; but if the second plate be turned round one quarter of a revolution, so as to make the plane of the second reflection perpendicular to the plane of the first, the whole of the rays will now be transmitted through the second plate. When this plate has described half a revolution, the rays will be reflected as at first; and when it has made three quarters of a revolution, they will again be transmitted, that is, when the planes of reflection are parallel, light is reflected, but when they are perpendicular, it is transmitted; or light in such circumstances can permeate glass in one direction, but not in another. Sir David Brewster, soon after Malus, began a vast series of experiments to determine the angles of polarization of different media, and to investigate the general law which regulates polarization by reflection from transparent bodies, which was crowned with the beautiful discovery

Light. that "the tangent of the angle of polarization is equal to the refractive index," or that when a ray is entirely polarized by reflection, "the angles of incidence and refraction are complementary." In this sketch it would be impossible to do justice to the investigations and beautiful theoretical deductions of Fresnel, which have combined the whole into an inductive science. We must direct the reader to the article on OPTICS for his important labours, as well as for the profound researches of Airy, Poisson, Biot, Arago, and Cauchy.

Newton rejected the explanation of double refraction offered by Huygens, because he considered the apparent polarization of the rays of light as inconsistent with motions "propagated through a fluid medium;" but this arose from his limiting his ideas of luminous vibrations, as entirely analogous to those of producing sound in air, in which they are propagated in the direction of the advance of the undulations. We owe to the late Dr Thomas Young the first idea of the vibrations being *transverse* to the direction of the luminous wave; an hypothesis which he illustrated by the propagation of the vibrations of a stretched cord put in motion at one of its ends. This happy idea has been shown to be a necessary consequence of the phenomena of the interference of polarized light, if we admit the theory of luminous waves. The subsequent investigations of Arago and of Fresnel have confirmed the speculations of the English philosopher, which have connected and elucidated those brilliant discoveries that have conferred lustre on the names of Malus, Fresnel, and Brewster. See OPTICS.

SECT. IV.—COLOUR OF OBJECTS.

The discovery by Newton of the colours produced by the decomposition of the sun's rays, naturally turned the attention of that profound philosopher to the cause of colour in different objects; and he has delivered a theory of colours, of which we shall now exhibit an outline.

1. Newton regards the colour of natural objects, not as produced by any modification which light undergoes from refraction or reflection at their surfaces, but as something inherent in the rays according to their different degrees of refrangibility. The same degree of refrangibility invariably gives the same colour; and when the rays are fully separated from each other by the prism, he found it impossible to change the colour. Thus he refracted the red ray with prisms, but found its tint unaltered; he reflected it from bodies which in daylight had other colours, but still it remained *red*; he transmitted it through coloured media of different tints, he passed it through the coloured rings produced by pressing together plates of glass, but he was unable to convert it into another colour. By condensation or dispersion he could render it stronger or fainter, but still it remained red. Similar experiments on the other rays were attended with similar results.

2. He found, however, that by mingling the different rays of the coloured spectrum, he could produce a sort of intermediate tint. Thus the intermixture of the yellow and red rays formed an orange, and that of the yellow and blue, a green. But this effect was only distinctly produced by the intermixture of contiguous rays; if they were far removed from each other in the spectrum, no such effect was produced. Thus the orange and indigo rays do not produce an intermediate green.

3. The intermixture of all the rays reproduced white light. Newton reflected a pencil of rays through a prism into a dark room, and then interposing a lens of three feet radius, about four or five feet distance from the aperture admitting the light, he collected the convergent rays upon a paper screen, and obtained an intense spot of white light. By

Light. moving the paper he could easily find the point of perfect whiteness; and, by drawing it farther from the lens, he could reproduce the coloured spectrum in an inverted order, as the crossing rays diverged farther from each other.

If any of the coloured rays were cut off before their convergence by the lens, the image upon the paper exhibited colour; and if either of them were made to predominate, that tint was rendered perceptible. Newton endeavoured to show the same with mixtures of coloured powders; and though this method presents mechanical difficulties not easily overcome, and the mixtures only afford a gray shade, yet when these were strongly illuminated by concentrated solar light, they became of a dazzling white; whilst all coloured objects appeared most splendid in the prismatic rays of their own colour. From these facts he considered the colour of objects to depend upon the predominance of the coloured rays they reflect. Thus minium, or red lead, appears red, because it reflects principally the least refrangible rays; a violet appears of the colour so denominated, because it chiefly reflects the most refrangible rays; and what we denominate the colour of an object is merely the hue of the rays which it most copiously returns to the eye.

On the other hand, transparent bodies which have colour, when held between the eye and the light, appear so by transmitting most copiously that ray. Thus, too, we see why a body not quite transparent may sometimes appear of different colours by transmitted and reflected light. Such a body may transmit most copiously the blue rays, and reflect the green ones; as we often find in coloured liquids, and sometimes observe in the crystals of fluor spar, and other mineral substances. This fact is a confirmation of the Newtonian theory of colour; for, were the *colour* inherent in the substance itself, it ought to appear equally by either mode of viewing it.

In transparent coloured liquids the shade often varies with the thickness of the column through which the light is transmitted. Thus a clear red liquid in a conical wine glass appears below of a pale yellowish hue; higher up it seems orange, and only has its full red hue when the column is of considerable thickness. This is owing to the most refrangible rays never being able to penetrate the liquid at all. The remaining part of these rays gives the yellowish colour to the thin film at the bottom of the glass; the separation of part of the yellow rays gives an orange tint to the next film of liquid; and, when the yellow rays are wholly stopped by the thicker column, the red, or least refrangible, come undiluted to the eye of the observer, and give their colour to the body of the liquid in the glass. See CHROMATICS.

SECT. V.—RELATION OF LIGHT AND HEAT.

It is well known that light and heat are intimately mixed in the beams of the sun; that some bodies give out both light and heat during combustion; and that a high temperature causes the extrication of light in all bodies, the gases excepted. This intimate relation between light and heat has induced some philosophers to consider them as mere modifications of each other. Certain it is that they have many properties in common. They are capable of reflection, of refraction, of concentration, of dispersion, and of polarization; they radiate between distant objects with great celerity, they penetrate solid bodies very readily, they are absorbed by dark and rough surfaces, are generally reflected by smooth surfaces, and they are capable of subverting some chemical combinations.

These properties show very striking analogies; and the phenomena of the polarization of heat, so well illustrated by Professor Forbes of Edinburgh, have undoubtedly rendered this analogy still more apparent: yet in the present state of our knowledge, it would be rash to pronounce that they

are absolutely identical. Their total separation, at least as far as our means of detection extend, in some instances; the very different substances which permit or retard their progress; and the different manner in which they affect our sensations, have led some inquirers to the opposite conclusion; and though it may still be true that they are modifications of the same kind of matter, it is safest to content ourselves with pointing out those circumstances in which they differ, as well as their general agreements.

1. Light and caloric are not intercepted by the same substances. If we interpose a plate of thin transparent glass between the face and a bright blazing fire, the intensity of the light has no apparent diminution, but the caloric rays seem to be immediately arrested; and if we make the experiment with a thin diaphanous plate of ice, they seem absolutely intercepted. Some recent experiments of Professor Forbes, with thin plates of ice, afforded an almost microscopic effect on the galvanometer of Melloni's apparatus; but supposing there was no minute hole in the ice, the difference of the transmission of light and heat through diaphanous ice is sufficiently striking. The same takes place with all other species of terrestrial light, though, as we shall presently see, the caloric rays of the sun instantaneously pervade ice.

2. The rays of caloric are more powerfully reflected from a metallic mirror, even of an imperfect shape, than from the best glass mirror; whereas the latter very powerfully reflects light. Dark and dense solids are very readily penetrated by caloric, though they are totally impervious to light.

3. Light affects the organs of vision in a peculiar manner, without producing inconvenience to that most delicate organ, the eye; but a radiation of heat without light, as from a vessel of boiling fluid, though the rays entering the eye may be so powerful as painfully to affect that organ, does not produce any thing analogous to vision.

In the sun's rays, however, heat and light are so intimately blended, that we cannot entirely separate them. The difference in their refractive power causes a partial separation in the coloured spectrum; but both the heat and light of the sun's rays seem to pervade glass or ice with equal facility. Leslie's photometer, placed behind a sheet of diaphanous ice, is immediately affected by the direct rays of the sun, and a lens of transparent ice will concentrate them, so as to fire combustibles; as was long ago observed by Jan Metius and Descartes, and has more recently been proved by Scoresby. The difference between the caloric influence of the sun and of artificial fires has been attributed to the different initial velocity imparted to the caloric emanations in both cases. This is not improbable; but some have considered the caloric influence of the sun's rays as an effect of the condensation or fixation of light. This was the idea of the late celebrated Sir John Leslie, and is the principle of his elegant *photometer*.

SECT. VI.—MEASURES OF LIGHT.

Various methods have been proposed for affording comparative measures of light. The principles of these depend either on the illumination, as ascertained by the distance at which we can distinctly perceive small objects, such as printed letters of a certain size; the comparative depths of the shadows of an opaque object; or the heat excited by the luminous emanations of the bodies compared.

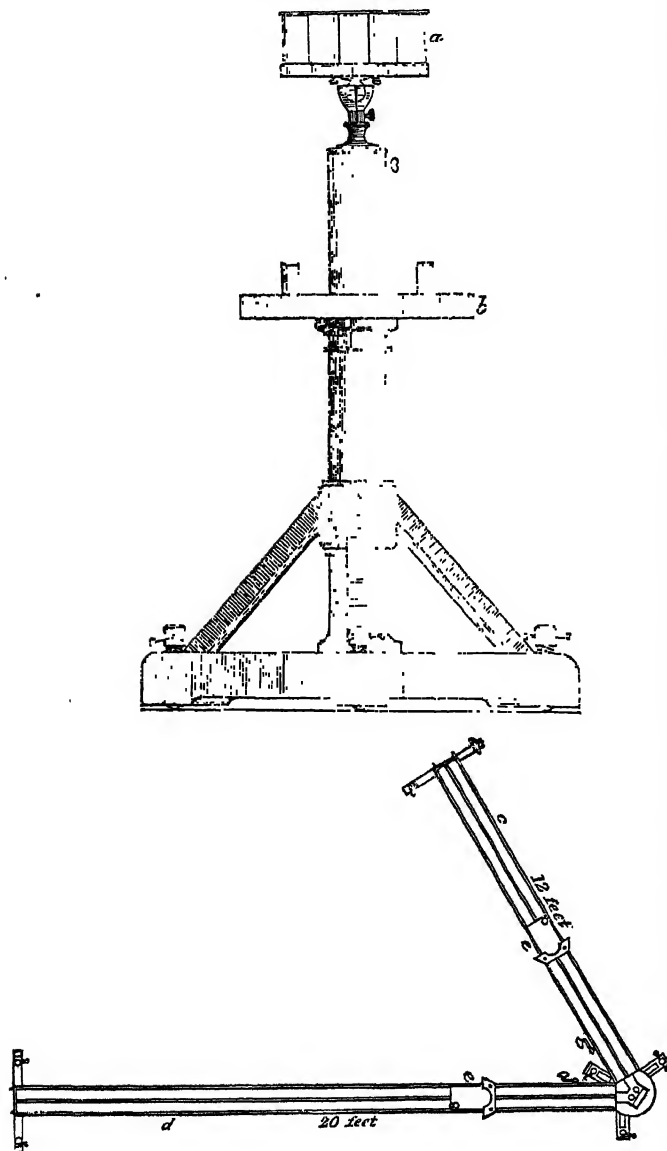
1. The distance at which the same eye can read a particular printed paper forms certainly a good criterion of the comparative degree of light given out by two or more luminous bodies, at the moment of comparison; but as it must greatly vary with the goodness of eye, it obviously cannot afford the basis of a general scale of illumination,

Light.

Light. by which the same individual can compare his observations at distant periods, or render the experiments of one person comparable with those of another. Still it is a convenient method, and requires but a very simple apparatus; a tube to admit the light in an uniform manner to the paper, and a graduated sliding rule to ascertain with ease the distance of the paper from the eye.

2. The comparison of shadows, which appears first to have been employed by Bouguer amongst several other ingenious contrivances, was the mode recommended by Count Rumford, who, in the year 1794, read a paper on this subject to the Royal Society of London. It is reprinted in a volume of his Philosophical Papers, published in 1802. This instrument, though well suited to the object in view, is cumbersome, and somewhat complicated. The photometric part *a* is a box eight inches wide; its back a plate of glass, covered by tissue paper, on which the shadows are projected. It is supported at a convenient height by a tripod-stand. The table consists of two narrow arms *c d*, resting on *b* at one end, and kept horizontal by feet at the other, intended to support the moveable brackets *e e*, on which are placed the lights to be compared. The arms are divided into decimals of an inch; and are here represented on a smaller scale than the rest of the instrument.

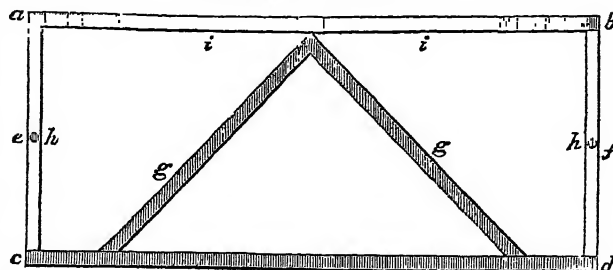
Rumford's Photometer.



Similar results may be obtained by the following contrivance, proposed, we believe, by Dr W. Ritchie. It consists of a rectangular box of brass, *a, b, c, d*, three inches long, and 2.2 inches wide. In its centre are two plane

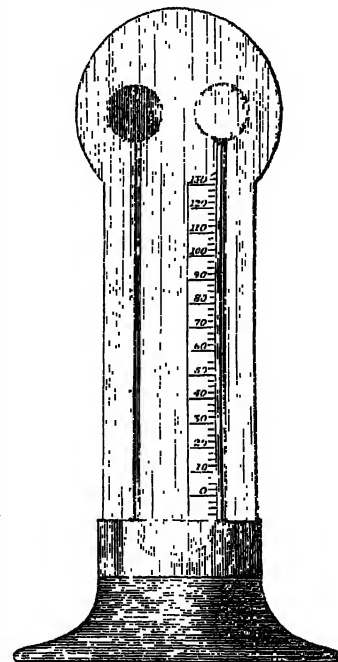
Light.

Ritchie's Photometer.



glass mirrors, *g g*, two inches square, cut from the same plate, and placed accurately at angles of 45° to the base of the box, as in the diagram. Each end *e f* of the box is open, and has, at equal distances from the mirrors, two cylindrical wires of brass, *h, h*, 0.2 inch in diameter, fixed vertically in the centre of the box. The top of the box consists of two thin plates of glass, *i i*, on which is pasted tissue paper. The inside of the box and the wires are blackened. When the two lights to be compared are placed before the ends of the box, and in its axis, the shadows of the wires will be reflected from the inclined mirrors on the tissue paper. The adjustments of the lights to the machine may be conveniently made by sliding brackets, placed on a long and steady table. If one of the lights be fixed, the other is to be moved backwards or forwards, in the line of the axis of the machine, until both shadows of the wires shall be of equal intensity. Thus, as the intensity of the light, in such cases, is inversely as the square of the distance of the luminous body, the difference between the position of each light, ascertained either by a graduated fillet on the table, or by a common Gunter's scale, will afford a numerical value of the comparative intensity of each light. The method appears sufficiently accurate for such experiments, but, like the former mode, is not susceptible of a fixed scale, unless we could find some uniform unvarying light to be considered as a standard.

Leslie's Photometer.



3. The calorific influence of luminous matter was proposed as the measure of the light by Lambert, and was adopted by Sir John Leslie as the principle on which he constructed his photometer. It is the author's differential thermometer, with one of its balls made of black enamel, whilst the other is of clear glass. An instrument so prepared, when exposed to a heating cause, has its balls unequally heated. To prevent the influence of currents of air, the whole is covered with an air-tight case of transparent glass. The black ball absorbs the calorific rays which impinge on it, the air within it expands, and raises

Light. the coloured liquor in the opposite stem of the instrument, to which a scale of equal parts being attached, each equivalent to $\frac{1}{10}$ th of a degree of the centigrade thermometer, affords a numerical result; and if we were sure that the intensity of the light is always in proportion to the calorific effect, the instrument would be a perfect photometer. But, unfortunately, we now know that this is not the fact, especially when we compare different kinds of light by means of this instrument. Thus the influence of a fire, so dull that it is impossible to distinguish a letter of a printed page, will affect this photometer at the distance of several feet, more than the diffused light of day sufficient to enable one to read the same book with facility; and it is more affected by radiation from a piece of iron scarcely incandescent in the dark, than by the intense light of phosphorus burning in oxygen gas. Even with the light of the sun refracted by the prism, the photometer does not indicate the point of the maximum of light. The greatest illumination is in the yellow rays; but this photometer rises highest when in or just beyond the confines of the red.

But if we employ the instrument for the purpose chiefly in the view of its ingenious inventor, the measure of the intensity of solar light, this beautiful instrument appears to us the most elegant and useful photometer hitherto proposed. Its delicacy is such, that when freely exposed, in our climate, to the light of the sky, without being acted on by the direct solar rays, it generally ranges in summer from 30° to 40° , and in winter from 10° to 15° . Exposed freely to the sun-beams at noon in summer, it usually mounts to between 80° and 90° ; and in the depth of winter is generally about 25° . In the glowing language of its inventor, "the photometer exhibits distinctly the progress of illumination from the morning's dawn to the full vigour of noon, till evening spreads her sober mantle. It marks the growth of light, from the winter solstice to the height of summer, and its subsequent decay through the dusky shades of autumn; and it enables us to compare, with numerical accuracy, the brightness of distant countries—the brilliant sky of Italy, for instance, with the murky air of Holland."

SECT. VII.—EVOLUTION OF LIGHT WITHOUT APPRECIABLE HEAT.

The most familiar instance of this phenomenon is in the rays of the moon, planets, and fixed stars, in the beams of which the most delicate instruments, even the thermomagnetic combinations of Melloni, have been unable to detect any calorific effect. In the beams of the moon and planets, the greatest portion of the incident heat would probably be absorbed by the dark nucleus of those celestial bodies; and if any heating rays were emanated from them towards us, they probably are far too attenuated to produce sensible effects at our planet. The light of the fixed stars, though probably like that of the sun, radiates through too enormous a distance to become sensible to any instrument for measuring heat hitherto contrived. The luminous meteors, too, that belong to our atmosphere, have in general no sensible heat; if we except meteoric stones and condensed electricity or lightning, which has occasionally fired combustibles. We must not confound the effect of the aurora borealis on the magnetic needle with heat; it appears to be altogether magnetic, not calorific. We find, also, that certain terrestrial bodies have the power of emitting light, in some instances largely, without a corresponding degree of heat; and such are usually termed *phosphorescent*. Some of these have the property of absorbing light when exposed to it, and again visibly emitting it. Some become phosphorescent when slightly heat-

Light. ed; others give out light during their spontaneous decomposition. Phosphorescence has been examined by Bartholini, Fabricius ab Aquapendente, Bayle, Algarotti, Reaumur, Father Beccari, Father Bourges, Abbé Haller, Leroi, and Canton.

1. Many bodies, when exposed to light, particularly that of the sun, absorb it, and emit it immediately on being removed into a dark place. When a diamond of some size is thus exposed, it has been observed to give out flashes of light in the dark for a short period, and it recovers this property on a fresh exposure. Several other precious stones, some calcareous minerals, almost all animal and vegetable substances, when very dry, or after solution in nitrous acid, and even snow, are stated by Beccari to possess the same property in a greater or less degree. Several artificial compounds, when carefully calcined, have the same effect. This is particularly the case with the *Bolognian stone*, and with Canton's phosphorus. The former is a calcined sulphate of baryta, found at the foot of Monte Paterno, near Bologna. Its properties were first discovered by Vincenzo Cascariolo, a shoemaker of that city, who, from its weight, mistaking it for a metal, attempted its reduction. The inventor kept the process secret, but it appears to have at length transpired. According to Kircher, the stone was reduced to a fine powder, beaten up with whites of eggs or linseed oil, and formed into a paste, which was repeatedly baked in a furnace. The Bolognian stone, as the preparation was called, has a very powerful phosphorescence, of a reddish colour; and the Italian preparation generally has this quality in a higher degree than the imitations prepared elsewhere; but it has been quite eclipsed by the phosphorus of Canton. Canton recommends oyster shells which have been long worn on a sea-beach, as the materials to be employed. They are to be calcined in a good coal-fire for half an hour. The purest parts are then to be collected, and reduced to a fine powder. Three parts of this, with one of sulphur, are to be rammed into a crucible about $1\frac{1}{2}$ inch deep, till nearly full. Place it in the midst of the fire, where it must be kept red hot for at least one hour, and then allowed to cool, when the contents are to be removed from the crucible. The fine portions of this, which will be quite white, are to be scraped off, and immediately enclosed in a bottle with a well-ground stopple.

When this bottle is exposed for a short time to the light of day, to any artificial light, or, better, to the direct rays of the sun, it will be luminous for some minutes in the dark; and its light will be renewed by a fresh exposure to the sun. At one time it was a subject of controversy, whether or not these substances emitted only the light they had imbibed by exposure, as it was conceived to be a ready mode of deciding the dispute between the followers of Newton and Descartes respecting the nature of light. Galeazzo, Zanotti, and Algarotti of Bologna, tried whether, when exposed to the different rays of the prism, the Bolognian phosphorus would only show the colour of that ray to which it had been exposed; and they thought that its light was reddish, to whichever ray it had been previously exposed. But in these experiments its light was very feeble, and therefore not satisfactory. Afterwards, however, Father Beccari of Turin, by exposing pieces of more powerful phosphori in tubes of different coloured glass, found that, in the dark, they only emitted the colour of the light to which they had been exposed.

Van Helmont appears to have discovered another powerful phosphorus; and Baldwin of Misnia, in 1677, found that the residuum of a solution of chalk in aquafortis, after distillation, formed a phosphorus of considerable power, but inferior to that of the Bolognian. Du Fay, in 1734, found that similar properties resided in gypsum, marble, and topaz. The emerald, diamond, and many other precious

Light. stones, he found to have the same property, without calcination, and by mere exposure to light. From the experiments of Margraaf, all the earthy sulphates have this property when calcined; but he thought that neither metals, metallic ores, nor agates, possess it. The analysis of topaz shows that it contains fluoric acid; and we may now generalize the observation, and state, that all substances capable of becoming phosphorescent by calcination contain some fixed acid, and probably all minerals containing such acids are capable of becoming, in like manner, phosphorescent.

The experiments of Canton are the most complete on this subject (*Phil. Trans.* lviii.). When his phosphorus was, for a short time, exposed to the light of a candle, the moon, or the diffused light of day, it shone for a considerable time in the dark. When exposed to the direct rays of the sun, it gave out light for two hours, at the common temperature of the air. When it had ceased to shine in the dark, the application of heat renewed its luminousness for a short time. If the glass containing the phosphorus be placed in boiling water, its luminousness will be stronger than in the cold, but will last a shorter time. When it has ceased to give light in hot water, it will again give out light on being placed on a hot iron between 400° and 700° Fahrenheit.

2. Some natural bodies become phosphorescent by a gentle heat. Thus, some kinds of fluor spar, particularly the coloured varieties, give out a pure greenish or a bluish light by being heated; and this is finely exhibited by the green varieties. The mineral called *phosphorite*, which is a fibrous phosphate of lime, found principally in Spanish Estremadura, gives out much light when heated. Some marbles, some ores of metals, coal, wax, butter, oil, and several other mineral and vegetable substances, so treated, become more or less luminous. In some the light is momentary, in others it lasts several minutes. It soon attains its maximum brightness, and then fades away. A stream of cooler air extinguishes the light for a moment, but it re-appears on the ceasing of the cool current. Analogous to this class of bodies in some degree are those substances which give out light on percussion; such as siliceous minerals, either with one another or with steel, hard porcelain, or the like; but they also, in such collisions, emit heat as well as light.

3. Mineral and vegetable bodies, during their decomposition, often give out light. Fish, mutton, and rotten wood, are the best known instances of phosphorescent bodies of this class.

The luminousness of fish is well known; and Dr Hulme has shown that the light of herrings and mackerels begins to appear whilst the fish is still eatable, and soon arrives at its maximum, but begins to decrease when they pass to putridity. To produce this change, the fish should be kept in a dark and cool place. It is not confined to the skin of the animal, for if cut into pieces, the surface of each piece becomes luminous; and it is often seen within the mouth of the fish. The luminous matter easily rubs off, and may be transferred to the hands of him who touches the fish. This light is not attended by any perceptible heat. When scraped off, it forms a gelatinous liquid, that will shine for several days, if preserved in a phial. The addition of fresh water, lime water, water impregnated with carbonic acid, of vegetable acids and alkalies, extinguishes it, as do neutral salts, infusions of pepper, and camphor, when strong; yet the same substances, in a weak solution, seem to promote it, and even render it more durable; but sea-water increases its splendour. This luminous property is also found in lobsters and in testacea, especially in the *Pholas Dactylus*, and its congeners. This animal is luminous when quite fresh, and is mentioned by Pliny as rendering the mouths of those who eat it luminous. The light is readily impart-

ed to milk and sea-water, but it is extinguished by spirit, wine, or vinegar. Sea-water, thus rendered luminous, increases in brightness by a gentle heat; but when heated to 133° Fahrenheit, it is suddenly extinguished, and cannot again become luminous. This luminous matter, when narrowly examined, sometimes appears to give out a sort of lambent flame, which closely resembles that of a solution of common phosphorus in oil; and it smells of phosphorus or of phosphuretted hydrogen. The flesh of *Mammalia* undergoes similar changes during its decomposition. This has often been seen in mutton, beef, and veal. This light has sometimes been observed on corpses, much to the terror of the vulgar; and in vaults where dead bodies have been deposited, it has sometimes been observed in a glairy matter adhering to the vault. This last matter, however, probably is the produce of some cryptogamian plant; and it is well known that rotten wood is sometimes highly luminous. A light of this kind is stated to have been observed round the body of a woman at Milan, but it flitted from the bed on the approach of the reporter. This appearance has been more frequently seen around graves, and has obtained in Scotland the name of *elf-candles*.

The light from corrupting animal and vegetable matter requires oxygen in some form for its continuance. It is soon extinguished in the exhausted receiver of the air-pump, as Mr Boyle long ago observed; but it would seem that the small quantity of air which is contained in water is sufficient to sustain its luminousness. No perceptible heat is extricated in any of these kinds of phosphorescence.

Analogous to the light given out by decaying organized bodies, is the curious meteor termed *ignis fatuus*, or *will-o'-the-wisp*. Its ordinary appearance is like the faint flame of a taper; sometimes it resembles the light of a torch, or a faggot; but it usually recedes as it is approached, and can rarely be observed near at hand. The colour of the light is usually pale bluish, and seems brightest when most distant. It is most frequent in marshy grounds, in churchyards, or where a considerable mass of animal and vegetable putrefaction is going on. Dr Derham once observed an *ignis fatuus* playing round the head of a dead thistle; and, by cautiously approaching, he got within two or three yards of it, when a slight movement of the air made it flit; and when he pursued it, he was unable to overtake it.

A remarkable appearance of *ignis fatuus* was, about a century and a half ago, common in the vicinity of Bologna, which has been well described by Beccari (*Phil. Trans.* vii.). He estimated that two, which at that time appeared almost every dark night, one to the east, the other to the north, of the city, gave light equal to an ordinary faggot. One of them accompanied a friend of Beccari for a mile along the road to Bologna, giving as much light as that of the torch carried before him. Sometimes these meteor divided into several parts, or floated like waves of flame, dropping small scintillations.

Dr Shaw, the author of *Travels in the Holy Land*, describes a remarkable one which accompanied him, for upwards of an hour, in one of the valleys of Mount Ephraim. Its shape was at first globular, but it afterwards spread so as to involve the party of the traveller in a pale inoffensive blaze, then disappeared; again it re-assumed the globular form, and again expanded itself, at certain intervals, over more than two or three acres of the adjacent mountains. The atmosphere that evening had been very hazy, and the dew, as it fell on their bridges, felt unusually unctuous and clammy; a kind of weather, says Shaw, in which sailors observe the balls of fire that flit about the masts and yards of ships.

The cause of *ignis fatuus* has been disputed. It can scarcely be accounted for by the phosphorescence of the glow-worm, or any species of fire-fly. It differs also from electric flame, but has the greatest resemblance to the flame

Light. of phosphuretted hydrogen; a gas which spontaneously inflames, on coming into contact with air, and which is given out during the corruption of organic matter. This gas is absorbable by water and by fatty oils, to which last it imparts its phosphorescent qualities; and perhaps the luminousness of fish may depend upon the union of this substance with oily or mucous matter. There is some difficulty in accounting for the appearance so constant and considerable as that described near Bologna. The ground on which the largest meteor appeared is a hard clay, very retentive of water; whilst in the hilly district, where the Bolognian ignis fatuus was smaller, the soil was a loose sand. Becari however states, that they chiefly frequented the banks of streams. All accounts confirm the absence of sensible heat from these meteors.

SECT. VIII.—LIGHT EMANATING FROM LIVING ANIMALS.

A luminous appearance somewhat similar to that given out by decaying organic matter is occasionally observed to play round some classes of living animals; and regularly emanates from the bodies of others, at particular seasons; or as a constant concomitant of motion, by another class.

Of the first kind, probably, is that light sometimes observed playing around the ears and manes of horses, which, though by some attributed to electricity, is probably an emanation from the animal itself; and may perhaps consist of a phosphuretted gas, disengaged by some unknown process of the animal economy. A lambent flame, of a similar nature, has in a few instances been remarked around the heads of children; a circumstance which is happily seized by Virgil in his fine description of the glory that appeared on the temples of the young Ascanius.

Ecce levis summo de vertice visus Iuli
Fundere lumen apex, tractuque innoxia molli
Lambere flamma comas, et circa tempora pasci.
Æn. ii. 683.

Living vegetables, in like manner, also occasionally give out light. This has been particularly noticed in the marigold, the orange, the Indian pink or *lilium bulbosum*, *aconitum napellus*, *tropæolum majus*, and other plants. But there are animals in whom luminousness forms a necessary part of their economy.

The most familiar instance of this is the common glow-worm, *lympyrus noctiluca*, and its congeners. The male of this species is a *coleopterous* insect, and sports in the air; whilst the female is *apterous*, doomed for ever to crawl amongst herbaceous plants, or to nestle on the leaves of shrubs; but when the shades of evening are drawn around, during the summer months, a spot of lucid yellow light, generally tinged with a shade of green, emanates from the extreme rings of her abdomen, and sprinkles the hedges, in some parts of our island, and the warmer parts of Europe, with brilliant stars. The final object of this light is probably to attract the notice of the male insect, who otherwise could with difficulty distinguish his wingless mate. The male of the English glow-worm is generally believed to be destitute of the apparatus for light; though Mr Walker (*Phil. Trans.* for 1684) asserts, that the male of one species of English glow-worm has the luminous appendage. The winged species of glow-worm are common in Italy, Spain, the south of France, and still more so in equinoctial America, in which the flickering light of the numerous fire-flies affords a pleasing and interesting spectacle. This light is found to belong to both sexes, though it is most striking in the females.

But the luminous property of the *Fulgora Lanternaria* of South America surpasses that of all animals, in the splendour of its light. It is a large insect, of the order *Hemip-*

Light. *tera*, three and a half inches long. It has a sort of thick proboscis, about one inch in length, which is the luminous organ. The light emitted by this species is so splendid that two or three of them will illuminate a chamber.

In all these animals the light has so much the appearance of phosphorus dissolved in oil, that probably it may be a secretion of an analogous nature.

Many animals inhabiting the sea are highly luminous; and it is almost established that the luminousness so often exhibited by the ocean depends entirely upon myriads of minute phosphorescent animals.

This appearance is not constant, but is very frequent in most latitudes, and generally, whenever the night is dark, may be seen exceedingly brilliant around our own coasts. When the water is still, it is seen as numerous bright points of a bluish white phosphorescent light of considerable intensity; but when the water is agitated, as by the waves, the motion of a ship, or the dashing of oars, the light appears often in flashes so intense as to show the hours on a watch, or to render legible the pages of a large printed book. The number of the luminous points varies greatly at different times and in different places; and often in the course of a short sail this fluctuation is very conspicuous. We have observed the coruscations, during a gentle breeze, like a line of fire several hundred yards in length from the bows, or in the wake of the vessel. This appearance is found in every sea, but with some difference in intensity and colour, as it seems to proceed from various genera of animals.

The luminousness of the sea was long ascribed to electricity; but about the beginning of this century it was proved, in many instances, to depend on the presence of animalcules in the ocean, particularly of a minute species of medusa, which abounds in our seas, and seems to be the same as *M. Hemisphaerica* of Muller. Several years before, Sir Joseph Banks discovered other two animals which rendered the sea luminous, viz. a sort of shrimp, *Cancer Fulgens*, and a large medusa, *M. Pellucens*, both of which abound on the coasts of Brazil.

From 1810 to 1814, the writer of this article made many observations on this subject, both on the coasts of Britain and in the Bay of Biscay. When the water was very luminous in that sea, on several evenings he drew water and carried it for examination into the cabin. Of course it ceased to appear luminous when viewed by candle light, but he could distinguish, floating in a glass of sea-water, a number of pellucid animalcules, which, when magnified by the globular form of the containing vessel, evidently belonged to several species of *Medusaria*, amongst which he could observe the genera *Noctiluca* of Lamarck, a *Cayanea*, and a *Beroë*. The general size of these animals was from one twentieth to one thirtieth of an inch in diameter. That the luminousness of the sea was derived from these minute animals, appears to be proved by the following simple experiments. Portions of this sea-water were put into separate beer glasses, and the number of animalcules in each was carefully ascertained. They were carried successively to the deck, and when the water was dashed on it, the number of lucid points was ascertained. In most instances the number of these points coincided with the number of animals previously observed in the glass; in no instance were the lucid points *more*; though occasionally they were not so numerous, probably owing to some of them adhering to the glass, or having escaped the shock that stimulated their light-making organs. The same animals he has often observed, even more numerous, in the luminous sea-water of the British coasts; and has obtained similar results by a repetition of the experiments. The luminous points often adhere to the fingers; and on introducing such a luminous speck into a glass of non-luminous sea-water, careful inspection will show a medusary animal

Light. floating in the water. The sea-water, on such occasions, if left at rest in glass vessels on deck, or even if suspended in gimbals, would occasionally exhibit luminous points; and the author conceives that the light either attends the voluntary movements of those minute creatures, or is emitted at their will. When sulphuric or other strong acid is poured into luminous water, it will produce a considerable flash of light, either by the effort of the animals to escape, or the unexpected stimulus it produces. In some climates the sea exhibits a fiery-red hue. This has often been observed in the Chinese seas, and in some parts of the Indian Ocean. It is produced, according to the best authorities, by myriads of minute animals that emit a reddish light. Captain Horsburgh and Mr Langstaff have described other kinds of light occasionally observed in the Indian Ocean. The latter mentions, that during a passage from China to New Holland, the sea at night had a faint milky appearance, as if snow had just fallen on the water. The sailors thought it was produced by a coral shoal, but seventy fathoms of line did not find bottom; and when the water drawn up was examined, it was observed to swarm with minute globular bodies, about the size of a pin's head, linked together, and of a milky hue, probably some minute species of medusa. It is well known that the larger fish are sometimes luminous. This has been remarked in the bonito and the shark; but whether they are naturally luminous, or only in consequence of the adhesion of luminous animalcules to them, is not determined.

Some have ascribed the luminousness of the sea to electricity, others to putrescent particles in the water. The former opinion is not probable, from the appearances observed; the latter is supported by the luminous matter of dead fish being diffusible through water, and imparting to it luminous qualities; but the known phosphorescence of many small sea animals, and the coincidence of the number of scintillations, in the experiments above detailed, with that of the animals observed, incline us to believe that the luminous appearance of the ocean depends on the presence of minute animals.

SECT. IX.—CHEMICAL EFFECTS OF LIGHT.

Light appears to be possessed of chemical properties and energies distinct from those of heat, which may be considered as further proofs of its materiality.

It is capable of decomposing various metallic salts. Thus, if a colourless solution of nitrate of silver be exposed to light, it gradually blackens; a powder is deposited which has the same colour, and the salt is found to have lost a portion of its oxygen. This change is more rapidly effected by the direct rays of the sun than by the diffused light of day. The neutral solutions of gold, also, when exposed to light, in contact with charcoal, with vegetable or animal matter, as cotton and silk, are decomposed. This is the principle of the beautiful process invented by Mrs Fulham, for ornamenting muslin and silk stuffs with flowers and sprigs of gold. The salt of gold parts with its acid and its oxygen to the vegetable or animal matter through the agency of light. The dry salt formed by dissolving gold in nitro-muriatic acid is also slowly decomposed by light under similar circumstances.

Scheele examined the effects of light on metallic solutions, and discovered that the chemical effects of the different coloured rays of the prismatic spectrum were different. By enclosing solutions of silver in glasses of different colours, he found, that in red glass there was very little effect produced, whilst in violet-coloured glass the blackening was speedily produced. These interesting facts were confirmed by Senebier and by Thomas Wedgwood.

Light. The latter showed, that in the full sunshine, the blackening of muriate of silver was produced in two minutes, and in the shade that several hours were required to produce this effect. The sunbeams transmitted through red glass have very little blackening effect; yellow and green glass are somewhat more effectual; but blue and violet glass produce the most decisive effects. The discovery of Herschel, respecting the different refrangibility of light and heat, induced Ritter and Wollaston to try the effect upon the salts of silver beyond the violet ray; and they found that the blackening was most decided beyond the visible boundary of the spectrum at the violet end. In some experiments of Senebier, muriate of silver was darkened by the violet ray in 15", by the blue in 29", by the green in 37", by the yellow in 5' 30", by the orange in 12', and by the red in 20'. These effects are wholly due to light; for no effect is produced in the hottest point just beyond the red rays.

Berthollet proved, that during the action of light on many metallic oxides, as those of gold, silver, lead, and mercury, a portion of their oxygen was extricated; and this is supposed to be the change produced in the blackening of the salts of silver, viz. a partial reduction of the metal. Sir Humphry Davy found that tritoxide of lead, when moistened, and exposed to the red rays, became red, that is, it lost oxygen, and became a deutoxide. Oxide of mercury, obtained by mixing potash and calomel, was not changed by the most refrangible rays, but became red in the least refrangible rays, which must have resulted from the *absorption* of oxygen. The violet rays produced on the moistened red oxide of mercury the same effect as a stream of hydrogen gas, that is, a deoxidation. Wollaston found that these rays produced an *oxidizing* effect on one vegetable substance, resin of guaiacum. This resin becomes green by absorbing oxygen; and he found that it underwent this change in the violet rays, but again obtained its yellow hue on being exposed to the red rays.

Some of the acids suffer decomposition by light; thus, if we expose colourless nitric acid to the sun's rays, in a flask provided with a bent tube, and terminating in a pneumatic apparatus, the acid becomes coloured, from the formation of nitrous gas, and oxygen may be collected in the trough in the usual way, as Berthollet ascertained. Light also decomposes some vegetable acids, such as the hydrocyanic; and to preserve such compounds pure, it is necessary carefully to exclude light.

Light also in some cases favours chemical combination. If chlorine which has been collected over water, and therefore contains water, be exposed to light, the water is slowly decomposed; its hydrogen enters into combination with the chlorine to form hydro-chloric or muriatic acid, and its oxygen is liberated. The influence of light is still more striking on chlorine and on hydrogen. If we mix equal proportions of these gases, and the access of light be carefully excluded, no action takes place, or their union is very slowly produced; but if we expose them to the diffused light of day, combination will take place in a quarter of an hour. If exposed to the direct beams of the sun, the union is instantaneous, and with a violent explosion. Davy found that when such a mixture was exposed to the red rays only, the gases united without explosion, yet more rapidly than when exposed to the violet rays; but that the conversion of a solution of chlorine into muriatic acid took place most readily at the most refrangible end of the solar spectrum.

SECT. X.—EFFECTS OF LIGHT ON PLANTS.

The change produced on vegetable colouring matter by light is familiar in the process of bleaching by exposure to

Light. the sun. But the influence of light on living vegetables is much more remarkable.

If a plant grow in total darkness, its natural green hue is not acquired; but it will be white, though in other respects vigorous. This is familiar in the *etiolation* or blanching of certain garden-stuffs, as celery, sea-kale, endive, &c. The late Professor Robison, many years ago, remarked that plants growing in darkness were not only white, but that they did not attain the natural form of their leaves, nor their natural odour. In descending into a coal mine, he accidentally met with a plant growing luxuriantly, the form and qualities of which were entirely new to him. The sod on which it grew was removed, potted, and carefully attended to in his garden. The etiolated plant languished and died; but the roots speedily threw out vigorous shoots, which, from the form of the leaves, and peculiar odour, he readily recognised as common *tansy*. He repeated similar experiments upon plants of lovage, carvi, and mint, with analogous results.

The green colour of vegetables, and even the form of their leaves, are materially influenced by light.

Some experiments of Senebier would lead to the conclusion that it is the violet end of the spectrum which has the greatest influence in counteracting the effects of *etiolation*. This production of the dark colour of plants would appear to depend upon the decomposition of carbonic acid by the living vegetable, when acted on by light, and the fixation of its carbon. That light is necessary to this process, is proved by the experiments of Priestley, Senebier, Ingenhousz, De Saussure, Davy, and many vegetable physiologists. Growing plants in sunshine give out oxygen by the decomposition of carbonic acid; but in darkness carbonic acid is evolved; and Ellis has demonstrated, in his interesting essays, that oxygen, under such circumstances, always disappears from the air in which vegetation is going on. Light, then, acts an important part in the vegetable economy, by fixing the most dense and abundant of the three general elements of vegetable matter. The influence of light in maturing fruits is well known. The fruits which when ripe are saccharine, are previously *acid*; that is, their hydrogen and carbon are combined with an excess of oxygen. Light, by favouring the evolution of oxygen, and the fixation of carbon, converts the vegetable acid into sugar, and thus provides a suitable food for the embryo in the seed. On the other hand, the influence of light is not less conspicuous in another class of vegetables. In an early stage of the germination of seeds yielding farina when ripe, the tender rudiment of the seed is enveloped in a slightly saccharine juice, as may be seen in young wheat and maize. Now, what is wanted to convert them into farina is the evolution of oxygen, and the fixation of a larger quantity of carbon. These two indications are fulfilled by the influence of light on the growing vegetables; and thus we can explain why the sun's influence is so essential in the one case to the formation of sugar from an acid; and in the other, of farina from a saccharine juice. The same principles will explain why a farinaceous seed, when planted in the ground, becomes again saccharine. Light is now wanting; oxygen is absorbed, and partly aids in the evolution of the redundant carbon, partly is added to the two other general elements. This view affords an instance of the important agency of light in vegetation, and a beautiful example of the simplicity of the means employed to produce diversified effects in the works of creation.

SECT. XI.—EFFECTS OF LIGHT ON ANIMALS.

The facts noticed in the last section show the powerful influence of light on vegetable forms. But its effects on

the exterior of animals, though less striking, are not unimportant.

Light.

1. The influence of the sun's rays in deepening the colour, or in giving a brown tint to the skin, seems to be more due to the light than to the heat of the sunbeams; for the parts of the skin covered by the clothes, though kept thus hotter than the parts exposed, do not undergo this change. The pale visage and enfeebled vitality of those who live much in obscure apartments, in prisons, and in mines, are well known; and though probably the most violent symptoms that characterize the *anhæmia* of miners, in which the skin assumes a yellowish, waxy hue, and the lips become bloodless, be chiefly due to breathing a vitiated atmosphere, yet some influence is certainly attributable to want of light. The *anhæmia* of persons long confined in dungeons has often been remarked, and was lately described as strikingly exemplified in the person of Caspar Hauser, the young man whose mysterious birth, confinement, and assassination, have hitherto baffled conjecture.

In climates where the heat renders a state almost approaching to nudity desirable, all travellers agree that the development of the human frame is early, and the form has fewer deviations from the symmetry natural to the race than amongst northern nations. Deformity is said to be comparatively rare in hot climates, where the surface is much exposed; and this has been attributed by Dr Edwards in some measure to the influence of light. Perhaps, after making due allowance for the less chance of rearing sickly or deformed children amongst barbarous nations, and for the prevalence of infanticide amongst them in such cases, there is considerable justice in his remarks on this subject; without which it would be difficult to account for the fine muscular and rounded forms so often observed amongst nations agreeing in nothing except in the prevalence of a very free exposure of their persons to the full influence of light; as amongst the Mexicans and Peruvians, the Chaymas and Muyscas of South America, the Caribbs of the Antilles, the inhabitants of the numerous groups of the South Seas, or the free inhabitants of Africa. Probably, too, a part of the effects attributed to country air, in restoring to health the sickly child of the city artizan, is due to *insolation*, or the exposure to light, which appears to have the property of invigorating the vital functions, and of elevating the spirits of those who have suffered a long deprivation of its cheering influence.

2. The effect of light on the lower animals is more marked, and is strikingly illustrated in the curious experiments of Dr W. F. Edwards upon the spawn of frogs. He enclosed portions of the spawn of the frog in different vessels permeable to water, some of which were perfectly opaque, while others freely admitted light; the temperature was the same, yet the eggs exposed to light came to maturity; but those deprived of light were not hatched.

He even found that the development of the perfect form of such animals depended on light. By enclosing tadpoles of both frogs and toads in different boxes, some of which freely admitted light, whilst others totally excluded it, and placing them in running water, he found that the tadpoles exposed to light underwent the change to the perfect form of the animal, as usual; whilst the tadpoles excluded from the light, though they seemed perfectly vigorous, did not undergo the transformation, even though they had increased to double or triple their primitive weight. He also conjectures that the Anguine Syren, *Proteus anguinus*, may only be the larva of some reptile retained in its imperfect form by the profound obscurity of the subterranean lakes of Carniola, in which it is found. In this conjecture, however, he is mistaken; for that singular animal has been kept alive without change a considerable time, under circumstances favourable to its transformation, if really an imperfect species,

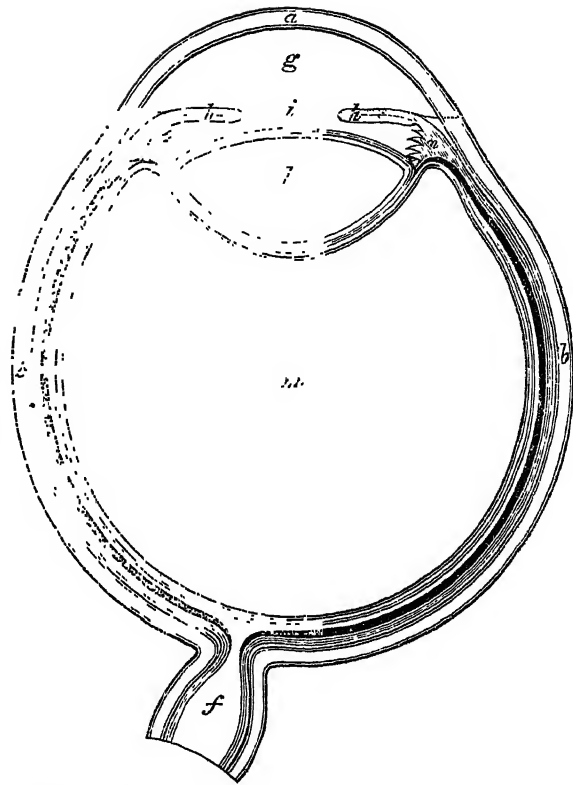
Light. by various naturalists; particularly, as we have been informed, by the Austrian archduke John; and also by the late Mr Melly, a zealous naturalist once resident in Liverpool.

The facts, however, already detailed, show that the influence of light on the animal economy is by no means inconsiderable. But the most interesting property of light, in relation to animals, is its effect in producing vision.

3. The rays of light emanating from bodies, or reflected from their surfaces, are destined to impress the sensorium through the EYE; an admirable and complex optical apparatus, in which the rays, after passing through the transparent *cornea*, *a*, sustain various refractions, until they reach the sentient expansion of the optic nerve, *f*, called *retina*. The cornea constitutes the front of the eyeball, the rest of its surface is formed of a dense white tunic, called the *sclerotic coat*, *bb*, which joins the cornea by its edges, forming with the latter an almost globular body, which contains the more delicate structures of the eye. Just within the cornea is observed a coloured ring, apparently formed of diverging fibres, termed the *iris*, *hh*. This ring is perforated by the *pupil*, a circular aperture in its centre, which is capable of contraction and expansion, by the action of the fibres of the iris, according to the increase or diminution of the light. This movement of the pupil is not under the will of the animal, but is regulated by the stimulus of light, so as to exclude any quantity that would be hurtful to the organ. The iris is attached to the outer coat of the eye, the sclerotic, by the *ciliary processes*, *nn*. Within the sclerotic lies a delicately thin vascular membrane named the *choroid coat*, having its interior surface lined with a black secretion termed the *pigmentum nigrum*, the probable use of which is to aid clear vision, by preventing a multiplicity of reflections in the bottom of the eye.

Still nearer to the centre of the eye lies the *retina*, which is continuous with the optic nerve, *f*, and is the part of the eye sentient to the impressions of light. Entering the bottom of the eye, but not just in its axis, is seen a thick cord, the *optic nerve*, by which the impressions upon the retina are conveyed to the brain.

The bulk of the eyeball is made up of three substances, which have been improperly termed *humours*. The first lies just within the cornea, and fills the space between it and the iris, as well as the smaller space immediately behind the latter. From its fluidity, it is termed the *aqueous humour*, *g*. The iris divides the chamber of the aqueous humour into an *anterior* and a *posterior portion*. The posterior wall of this chamber is formed by a delicate, transparent, capsular membrane, enclosing a lenticular body, convex on both sides, though more so posteriorly, which is named the *crystalline lens*, *l*. This body consists of concentric layers, formed of fibres externally less consistent, but increasing in density towards its centre; a structure intended for the purpose of correcting its *spherical aberration*. The capsule of the crystalline lens is retained in its situation by the *ciliary circle* or *ciliary processes*, *n*; and it lies imbedded in the most considerable of all the humours of the eye, the *vitreous*, *m*, which consists of a clear gelatinous substance, that recent anatomical investigations prove to be lodged in very delicate membranous cells. In the healthy state, especially in young persons, these humours are perfectly colourless and transparent, but they become coloured by age; and the crystalline lens has been seen in very old persons of a bright amber colour, though still transparent. Opacity of the lens forms the disease termed *cataract*. The obvious use of the humours of the eye is to refract the rays of light entering the eye by the transparent *cornea*, and to concentrate them on the *retina*. The difference in their consistence seems intended to make that organ a true and nicely adjusted achromatic optical instrument.



The ray from any object falling directly in the centre of the eye, perpendicular to its surface, will not undergo any refraction, but pass straight through to the retina; and its direction may be termed the *axis of the eye*. All the rays which fall obliquely on the eye will, by the refraction of the humours, be bent from their course, and cut the axis somewhere between the lens and the retina; and the refractive power of the humours is such as to converge on the retina all rays proceeding from any one point of a visible object, whether these rays fall on the cornea in a parallel or a diverging condition. But as these rays have all crossed the axis of the eye by the refractive power of the humours, it is obvious that the rays from the upper part of the object will impinge on the lower part of the retina, and those from the lowest point, on the upper part of that membrane. Hence the image of the object will be *inverted* on the retina. That this actually takes place we can easily satisfy ourselves, by removing from the posterior part of the eye of a sheep a portion of the sclerotic coat with a sharp knife, until it becomes translucent, when the image of a candle placed before the cornea will be seen inverted on the back part of the eye thus prepared.

In the usual state of the eye, its refractive apparatus is so contrived that all the rays from the same points of objects at some distance from the eye will *converge in the retina*, or the *principal focus of the eye will lie in that membrane*; but divergent rays from very near objects would converge in a point *behind the retina*, were there not some power of adjustment in the eye for correcting the confused image which would thus be formed. This may be effected in two ways; either by increasing the convexity of the cornea, or by bringing the lens to a greater distance from the retina. Some have attributed this adjustment to an alteration in the form of the eyeball, and consequently of the cornea, by the action of the motor muscles of the organ; but there is much more probability in the opinion that this adjustment is produced by the contractions and expansions of the *iris*. This part

Light.

Light.

of the eye is attached to the ciliary ligament, which is also connected with the capsule of the crystalline lens. Hence contraction of the pupil would tend to draw forward the lens, or remove it farther from the retina; and thus the rays which have their point of convergence *behind* the retina, would meet in that membrane, and a distinct image would be produced. That some such adjustment is necessary is obvious; for if, after contemplating a distant object, our attention be suddenly turned to a very near one, it is some time ere the second object is distinctly perceived; and the movement of the iris will be seen to take place before the second image is well defined. The retina is capable of affording the perception of external objects in its whole extent, except at the insertion of the optic nerve, a spot about $\frac{1}{10}$ th of an inch in diameter in man. Any image falling on this spot is invisible, as multiplied experiments have shown. This insensible point in either eye may be indicated by the familiar optical experiment of placing three coloured wafers horizontally on a wall, on a white ground, about two feet from each other. Let the operator place himself about two feet from the wall, opposite the middle wafer; shut one eye, and then gradually retire backwards, while he fixes his open eye on the wafer nearest the closed eye. When an ordinary eye is distant from the wall about *five times* the distance of the wafers from each other, the image of the middle wafer will have fallen on the insertion of the optic nerve, and will no longer be visible.

Two very interesting speculations connected with vision have long exercised the ingenuity of physiologists and metaphysicians, viz. how it happens that animals with two eyes see objects *single*, by means of double images on the retina; and how they appear *erect* by means of inverted images?

The first has been explained on the supposition of there being corresponding points in each eye that convey similar perceptions to the mind, and that such afford only the idea of *unity*. In the natural movements of the eyes, the images of external objects are supposed always to fall on such points; but should any cause throw the images on dissimilar points, then we have double vision. Hence, if with the finger we push one eyeball slightly out of its parallel position with regard to the other, two objects are perceived. In persons who squint, the parallel movement of the eyes is lost; and it has been supposed that in cases where the squinting has come on in adults from imperfection in one eye, that habit enables the individual to correct the illusion of double vision, and that the person ceases to notice the impressions made on the least perfect of the two eyes.

The second fact alluded to is that of *erect* vision by *inverted* images. That images of external objects are depicted inverted on the retina is perfectly well ascertained; and philosophers have been much puzzled to explain how the indications of vision and touch are reconciled. Some have imagined that at first we really see objects inverted, but learn by experience and by the sense of touch to correct the illusion. Other attempts have been made to explain it by what has been termed the *law of visible direction*; by which it is supposed that when any point of an object is viewed, the rays proceeding from that point must fall on the eye with different degrees of obliquity, yet that point will be only seen in the direction of the central ray of the cone of light proceeding from that point: And as the lines of *visible direction* must necessarily cross each other at the centre of visible direction, those of the lower part of the image on the retina must go to the upper part of the object, and those of the upper part of the image to the lower part of the object; and hence an erect object is considered as the necessary result of an inverted image.

This is very ingenious, but it is obviously hypothetical

and obscure. The physiological explication of single vision by double images suggested by Newton, and since supported by Wollaston, is based on what has been termed the *semi-decussation* of the optic nerves at their commissure, whereby the right half of the retina of each eye is placed in direct nervous communication with the right optic lobe, or right half of that part of the brain termed *corpora quadrigemina*, and *vice versa*. Hence impressions made on corresponding points in each retina may, in fact, be impressions on the *same points of the common sensorium*, and therefore co-operate in producing the same perception. The anatomical proof of this is still defective, but many facts give it probability. The subject has engaged the attention of Professor Alison of Edinburgh, who considers that this arrangement of the optic nerves is but a part of the provision by which nature has secured harmony between perceptions afforded by sight and touch. His explanation of one of the most perplexing questions in animal physiology is so ingenious, that we gladly avail ourselves of his permission to lay it before our readers.

According to him, the peculiar contorted or involuted course of the optic nerves (in all vertebrate animals) around the crura cerebri, until they are lost in the optic lobes, seems designed to secure that the position of the *impression on the sensorium* should be conformable to the true position of the object.

It is only in those animals intended by nature to contemplate objects with both eyes at once, as in mammalia and birds, that the semi-decussation of the optic nerve is found. The contrivance in fact implies that both eyes are to be at the same time directed to the same object, or that both optic lobes are to be constantly employed in vision at the same time; the right half of each retina being in connection with each optic lobe, and the left half of each retina in like manner connected with the left optic lobe. Now, the *right* half of each retina contains the image of the *left* half of the field of vision; and therefore the impressions made by the left half of the field of vision fall on the right optic lobe, and have, on their left, the impression resulting from the right side of the field of vision; on which, as both optic lobes are necessarily exercised together, the attention of the mind is equally directed.

Dr Alison considers that the grand contrivance adopted by nature to secure harmony between the indications of sight and touch is the *decussation at the pyramids* of the nervous fibres concerned in common sensation and in voluntary movements; the effect of which must be, that whilst the right side of the brain is that to which impressions from the left half of the field of vision are brought, it is also *that* on which all the other sensations of the left side of the body depend; or, in other words, *we both see and feel what is on our left by the right side of the brain*. Accordingly, it is in those animals only in which the semi-decussation of the optic nerves exists (namely, in *Mammalia* and birds) that the decussation at the pyramids exists, or that the sensations and voluntary motions of each side of the body appear to be in connection with the opposite side of the brain.

As the admirable mechanism of the eye, and its beautiful adaptation to the necessities and comfort of the animal creation, afford a striking instance of that wisdom and beneficence so conspicuous in the handiwork of the Deity; so the extinction of this exquisite and important organ must be considered as one of the severest of human calamities; a misfortune that perhaps cannot be fully appreciated by those who have not experienced the loss of sight, so feelingly deplored by our mighty bard in poetry that can only perish with the language in which it is expressed.

Thus with the year
Seasons return, but not to me returns

Light.

Light-
houses.

Day, or the sweet approach of even or morn,
Or sight of vernal bloom or summer's rose,
Or flocks, or herds, or human face divine;
But cloud instead, and ever during dark
Surrounds me, from the cheerful ways of men
Cut off, and for the book of knowledge fair
Presented with an universal blank
Of nature's works, to me expunged and raz'd,
And wisdom at one entrance quite shut out.

Some of the works that treat of light are, Aristotelis *Opera de Anima et de Meteor.*; Senecæ *Opera*; Plinii *Hist. Nat.*; Euclidis *Optica*; Heliodorus Larissæus *De Opticis*; Alhazen, *Optica cum Comment.* Vitellionis; Baconis *Opus Majus*; Maurolycus *De Lumine et Umbra*; Baptista Porta, *Magia Nat. et de Refractione*; Bacon's *Works*; Antonio de Dominis *De Radiis Visus et Lucis*; Borelli *De Vero Telescopii Inventore*; Galileo Galilei, *Opere e Vita*; Kep-

ler, *Paralipomena ad Vitellionem*; Schotti *Magia Universalis*; Descartes, *Opera*; Gassendi, *Opera*; Athan. Kircheri *Opera*; Huygenii *Opera*, also Snell's *Discoveries*; Newton's *Optics and Principia*; Boyle's *Works*; Hooker's *Micrographia*, and *Posth. Works*; Muschenbroeck's *Tentamina et Introd.*; Grimaldi *De Lumine*; Beccaria *Dell' Eletticismo*, &c.; Beccarii *Comment. de Phosphoris*; Bouguer, *Traité d'Optique*; Lambert, *Photométrie*; Montucla, *Histoire des Mathématiques*; Smith's *Optics*; Priestley on *Vision*; Hutton on *Light*; Cavallo's *Philosophy*; Leslie on *Heat*; Biot, *Traité de Physique*; Muncke, *Handbuch der Naturlehre*; Treviranus, *Beiträge zur Lehre von den Gesichtswerkzeugen und dem Sehen*; *Mémoires de l'Acad. Royale des Sciences*; *Mémoires de l'Institut, et de l'Acad. des Sciences*; *Phil. Trans. London*; *Phil. Trans. Edin.* (T. S. T.)

Light-
houses.

LIGHTHOUSES.

LIGHTHOUSE, and sea-light, are terms which, although not strictly synonymous, are indifferently employed to denote the same thing. A *Sea-light* may be defined as *a light so modified and directed as to present to the mariner an appearance which shall at once enable him to judge of his position during the night, in the same manner as the sight of a landmark would do during the day.*

Early his-
tory.

The early history of lighthouses is very uncertain; and many ingenious antiquaries, finding the want of authentic records, have endeavoured to supply the deficiency by conjectures founded on casual and obscure allusions in ancient writers, and have invented many vague and unsatisfactory hypotheses on the subject, drawn from the heathen mythology. Some writers have gone so far as to imagine, that the Cyclopes were the keepers of lighthouses; whilst others have actually maintained that Cyclops was intended, by a bold prosopopœia, to represent a lighthouse itself. A notion so fanciful deserves little consideration; and in order to show how ill it accords with that mythology of which it is intended to be an exposition, it seems enough to quote the lines from the ninth *Odyssey*, where Homer, after describing the darkness of the night, informs us that the fleet of Ulysses actually struck the shore of the Cyclopean island before it could be seen.

"Ενθ' ὕπναις πῆν νῆσον ἐσέβρακεν ὀφθαλμοῖσιν
"Οὐτ' οὖν κύματα μακρὰ κυλινδόμενα ποτὶ χέρσον
"Εἰσίδομεν πρὶν νῆας εὐσείλους ἰστυίλσαι.

Odys. ix. 146.

There does not appear any better reason for supposing, that under the history of Tithonus, Chiron, or any other personage of antiquity, the idea of a lighthouse was conveyed; for such suppositions, however reconcileable they may appear with some parts of the mythology, involve obvious inconsistencies with others. Nor does it seem at all probable, that in those early times, when navigation was so little practised, the advantages of beacon-lights were so generally known and acknowledged as to render them the objects of mythological allegory.

Colossus of
Rhodes.

About 300 years before the Christian era, Chares, the disciple of Lysippus, constructed the celebrated brazen statue, called the Colossus of Rhodes, whose height was upwards of 100 feet, and which stood at the entrance to the harbour. There is considerable probability in the idea, that this figure served the purposes of a lighthouse; but we do not remember any passage in ancient writers,

where this use of the Colossus is expressly mentioned. There is much inconsistency in the account of this fabric by early writers, who, in describing the distant objects which could be seen from it, appear to have forgotten the height which they assign to the figure. It was partly demolished by an earthquake, about 80 years after its completion; and so late as the year 672 of our era, the brass of which it was composed was sold by the Saracens to a Jewish merchant of Edessa, for a sum, it is said, equal to L.36,000.

Little is known with certainty regarding the Pharos of Alexandria, which was regarded by the ancients as one of the seven wonders of the world. It was built by Ptolemy Philadelphus, about 300 years before Christ; and it is recorded by Strabo, that the architect Sostratus, the son of Dexiphanes, having first secretly cut his own name on the solid walls of the building, covered the words with plaster, and, in obedience to Ptolemy's command, made the following inscription on the plaster—"King Ptolemy to the gods, the saviours, for the benefit of sailors." What truth there may be in this account of the fraud of Sostratus there is now no means of determining; and the story is only now interesting, in so far as it shows the object of the royal founder and the use of the tower. The accounts which have reached us of the dimensions of this remarkable edifice are exceedingly various; and many of the statements regarding the distance at which it could be seen are clearly fabulous. Josephus approaches nearest to probability, and informs us, that the fire which was kept constantly burning in the top was visible by seamen at a distance equal to about 40 miles. If the reports of some writers are to be believed, this tower must have far exceeded in size the great pyramid itself; but the fact that a building of comparatively so late a date should have so completely disappeared, whilst the pyramid remains almost unchanged, is a sufficient reason for rejecting, as erroneous, the dimensions which have been assigned by most writers to the Pharos of Alexandria. Some have pretended that large mirrors were employed to direct the rays of the beacon-light on its top, in the most advantageous direction; but there is nothing like respectable evidence in favour of this supposition. Others, with greater probability, have imagined that this celebrated beacon was known to mariners, simply by the uncertain and rude light afforded by a common fire. In speaking of the Pharos,¹ the poet Lucan, on most occasions

¹ Septima nox, Zephyro nunquam laxante rudentes,
Ostendit Phariis Ægyptia littora flammis.
Sed prius orta dies nocturnam lampada textit,
Quam tutas intraret aquas.

Light-houses.

sufficiently fond of the marvellous, takes no notice of the gigantic mirrors which it is said to have contained. It is true that, by using the word "*lampada*," which can only with propriety be applied to a more perfect mode of illumination than an open fire, he appears to indicate that the "*flammæ*" of which he speaks were not so produced. The word *lampada* may, however, be used metaphorically; and *flammis* would, in this case, not improperly describe the irregular appearance of a common fire. Those who are desirous of knowing all that occurs in ancient authors on the subject of the Pharos of Alexandria may consult Pliny, l. xxxvi., c. 12.; l. v., c. 13., and l. xiii., c. 11. Strabo, l. xviii., p. 791, *et seq.* Cæsar, *Comment. de Bell. Civil.*, l. iii. Pompon. Mela, l. ii., c. 7. Ammian. Marcellin, l. xxii., c. 16. Joseph. *de Bell. Judaic.*, l. vi. Nicolas Lloyd's *Lexicon Geographicum*, and the *Notitia Orbis Antiqui* of Celarius, l. iv., c. 1., p. 13.

Coruna Tower.

Mr Moore, in his *History of Ireland* (vol. i., p. 16), speaks of the Tower of Coruña, which, he says, is mentioned in the traditionary history of that country as a lighthouse erected for the use of the Irish in their frequent early intercourse with Spain. In confirmation of this opinion, he cites a somewhat obscure passage from Æthicus, the cosmographer. This in all probability is the tower which Humboldt mentions in his Narrative under the name of the *Iron Tower*, which was built as a lighthouse by Caius Sævius Lupus, an architect of the city of Aqua Flavia, the modern Chaves. A lighthouse has lately been established on this headland, for which dioptric apparatus was supplied from the workshop of M. Létourneau of Paris. (See also a curious account of the traditions about this tower in Southey's *Letters from Spain and Portugal*, p. 17.)

There is also a record in Strabo of a magnificent lighthouse of stone at Capio, or Apio, near the Harbour of Menestheus (the modern Mesa Asta, or Puerto de Sta. Maria), built on a rock nearly surrounded by the sea, as a guide for the shallows at the mouth of the Guadalquivir, which he describes in terms almost identical with those used by him in speaking of the Pharos of Alexandria. I am not aware of any other notice of this great work, for such it seems to have been, to have deserved the praises of Strabo.¹

In Camden's *Britannia*, a passing notice is taken of the ruins called *Cæsar's Altar*, at Dover, and of the *Tour d'Ordre*, at Boulogne, on the opposite coast; both of which are conjectured, on somewhat doubtful grounds, to have been ancient lighthouses. Pennant describes the remains of a Roman Pharos near Holywell, but cites no authorities for his opinion as to its use. There were likewise remains of a similar structure at Flamborough-head. A very meagre and unintelligible account is also given of a lighthouse at St Edmund's Chapel, on the coast of Norfolk, in Gough's additions to Camden, by which it might seem that the lighthouse was erected in 1272.²

Modern history.

Such seems to be the sum of our knowledge of the ancient history of lighthouses, which, it must be admitted, is neither accurate nor extensive. Our information regarding modern lighthouses is of course more minute in its details, and more worthy of credit, as the greater part of it is drawn from authentic sources, or is the result of the actual observation of the writer of this article, who has visited the most important lighthouses of Europe. It seems sufficient here to notice briefly the most remarkable establishments of the kind now in existence; reserving, for the latter part of the article, the more appropriate and important topics of the methods of illumination, and the systems of management.

Tour de Corduan.

The first lighthouse of modern days which merits attention is the Tour de Corduan, which, in point of architec-

tural grandeur, is unquestionably the noblest edifice of the kind in the world. It is situate on an extensive reef at

Light-houses.

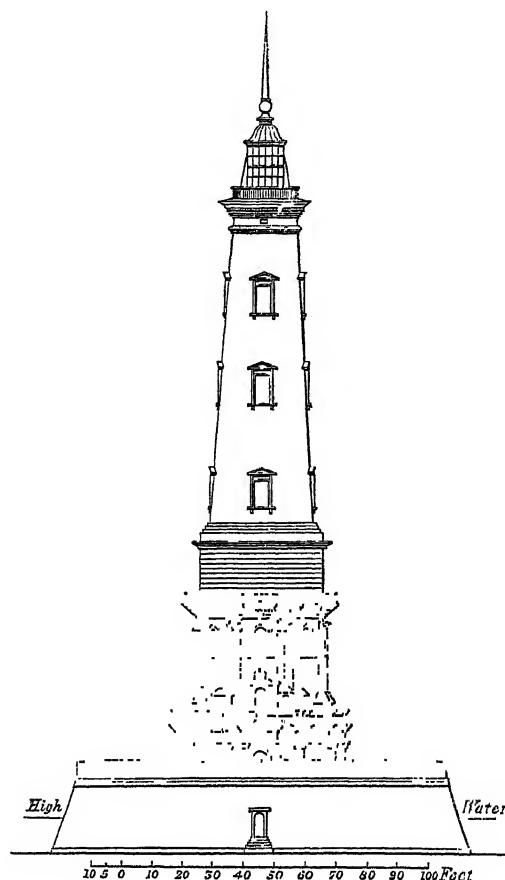


Fig. 1.

the mouth of the River Garonne, and serves as a guide to the shipping of Bordeaux and the Languedoc Canal, and, indeed, of all that part of the Bay of Biscay. It was founded in the year 1584, and was not completed till 1610, under Henri IV. It is minutely described in Belidor's *Architecture Hydraulique*. The building is 197 feet in height, and is shown in the accompanying woodcut, fig. 1. Round the base is a wall of circumvallation, 134 feet in diameter, in which the light-keepers' apartments are formed, somewhat in the style of casemates. The first light exhibited in the Tour de Corduan was obtained by burning billets of oak-wood, in a chauffer at the top of the tower; and the use of coal instead of wood was the first improvement which the light received. A rude reflector, in the form of an inverted cone, was afterwards added, to prevent the loss of light which escaped upwards. About the year 1780, M. Lenoir was employed to substitute reflectors and lamps; and in 1822 the light received its last improvement, by the introduction of the dioptric instruments of M. Fresnel.

The history of the celebrated lighthouse on the Eddy- Eddystone stone rocks is well known to the general reader, from the narrative of Mr Smeaton the engineer. These rocks are 9½ miles from the Ram-Head, on the coast of Cornwall; and from the small extent of the surface of the chief rock, and its exposed situation, the construction of the lighthouse was a work of very great difficulty. The first erection was of timber, designed by Mr Winstanley, and was commenced

¹ Oxon, 1807, p. 184.

² Gough's Camden's *Britannia*, vol. i., 318, and vol. ii., p. 198. Batcheller, in his *Dover Guide* (1845, p. 111), says, that the Dover Pharos was built "during the lieutenancy of Aulus Plautius and Ostorius Scapula, the latter of whom left Britain A.D. 53" (Pennant's *History of Whiteford and Holywell*, p. 112).

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in 1696. The light was exhibited in November 1698. It was soon found, however, that the sea rose upon this tower to a much greater height than had been anticipated, so much so, it is said, as to "*bury under the water*" the lantern, which was 60 feet above the rock; and Mr Winstanley was therefore afterwards under the necessity of enlarging the tower, and carrying it to the height of 120 feet. In November 1703, some considerable repairs were required, and Mr Winstanley, accompanied by his workmen, went to the lighthouse to attend to their execution; but the storm of the 26th of that month carried away the whole erection, when the engineer and all his assistants unhappily perished.

The want of a light on the Eddystone soon led to a fatal accident; for, not long after the destruction of Mr Winstanley's lighthouse, the Winchelsea man-of-war was wrecked on the Eddystone rocks, and most of her crew were lost. Three years, however, elapsed after this melancholy proof of the necessity of a light before the Trinity House of London could obtain a new act to extend their powers; and it was not till the month of July 1706 that the construction of a new lighthouse was begun, under the direction of Mr John Rudyerd of London. On the 28th of July 1708 the new light was first shown, and continued to be regularly exhibited till the year 1755, when the whole fabric was destroyed by accidental fire, after standing 47 years. But for this circumstance, it is impossible to tell how long the lighthouse might, with occasional repair, have lasted, as Mr Rudyerd seems to have executed his task with much judgment, carefully rejecting all architectural decoration, as unsuitable for such a situation, and directing his attention to the formation of a tower which should offer the least resistance to the waves. The height of the tower, which was of a circular form, and constructed of timber, was, including the lantern, 92 feet, and the diameter at the base, which was a little above the level of high water, was 23.

The advantages of a light on the Eddystone having been so long known and acknowledged by seamen, no time was permitted to elapse before active measures were taken for its restoration; and Mr Smeaton, to whom application was

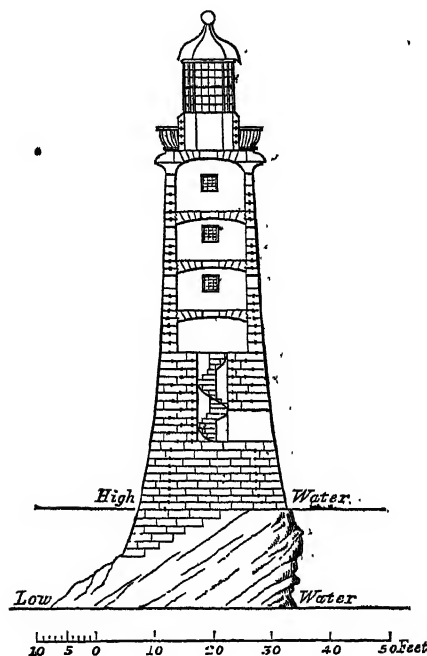


Fig. 2.

made for advice on the subject, recommended the exclusive use of stone as the material, which, both from its weight

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and other qualities, he considered most suitable for the situation. On the 5th of April 1756, Mr Smeaton first landed on the rock, and made arrangements for erecting a lighthouse of stone, and preparing the foundations, by cutting the surface of the rock into regular horizontal benches, into which the stones were carefully dovetailed or notched. The first stone was laid on 12th June 1757, and the last on the 24th of August 1759. The tower measures 68 feet in height, and 26 feet in diameter at the level of the first entire course, and the diameter under the cornice is 15 feet. The first 12 feet of the tower form a solid mass of masonry, and the stones are united by means of stone joggles, dovetailed joints, and oak treenails. It is remarkable that Mr Smeaton should have adopted an arched form for the floors of his building; instead of employing these floors as tie-walls formed of dovetailed stones. To counteract the injurious tendency of the outward thrust of these arched floors, Mr Smeaton had recourse to the ingenious expedient of laying, in circular trenches or beds in the stones which form the outside casing, sets of chains, which were heated by means of an application of hot lead, and became tight in cooling. The light was exhibited on the 16th October 1759; but such was the state of the lightroom apparatus in Britain at this period, that a feeble light from tallow candles was all that decorated this noble structure. In 1807, when the property of this lighthouse again came into the hands of the Trinity House, on the expiry of a long lease, Argand burners, and parabolic reflectors of silvered copper, were substituted for the chandelier of candles. Fig. 2 shows a section of the Eddystone lighthouse, as executed according to Mr Smeaton's design.

The dangerous reef called the Inch Cape, or Bell-Rock, Bell-Rock. so long a terror to mariners, was well known to the earliest navigators of Scotland. Its dangers were so generally acknowledged, that the Abbots of Aberbrothick, from which the rock is distant about 12 miles, caused a float to be fixed upon the rock, with a bell attached to it, which, being swung by the motion of the waves, served by its tolling to warn the mariner of his approach to the reef. Amongst the many losses which occurred on the Bell-Rock in modern times, one of the most remarkable is that of the York, 74, with all her crew, part of the wreck having been afterwards found on the rock, and part having come ashore on the neighbouring coast. During the survey of the rock also, many instances were discovered of the extent of loss which this reef had occasioned, and many articles of ships' furnishings were picked up on it, as well as various coins, a bayonet, a silver shoe-buckle, and many other small objects. Impressed with the great importance of some guide for the Bell-Rock, Captain Brodie, R.N., set a small subscription on foot, and erected a beacon of spars on the rock, which, however, was soon destroyed by the sea. He afterwards constructed a second beacon, which soon shared the same fate. It was not, however, until 1802, when the Commissioners of Northern Lights brought a bill into parliament for power to erect a lighthouse on it, that any efficient measures were contemplated for the protection of seamen from this rock, which, being covered at every spring-tide to the depth of 12 feet, and lying right in the fairway to the Firths of Forth and Tay, had been the occasion of much loss both of property and life. In 1806 the bill passed into a law, and various ingenious plans were suggested for overcoming the difficulties which were apprehended, in erecting a lighthouse on a rock 12 miles from land, and covered to the depth of 12 feet by the tide. But the suggestion of Mr Robert Stevenson, the engineer to the Lighthouse Board, after being submitted to the late Mr Rennie, was at length adopted; and it was determined to construct a tower of masonry, on the principle of the Eddystone. On the 17th of August 1807, Mr Stevenson accordingly landed with his workmen, and commenced the work by preparing

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the rock to receive the supports of a temporary wooden pyramid, on which a barrack-house, for the reception of the workmen, was to be placed; and during this operation much hazard was often incurred in transporting the men from the rock, which was only dry for a few hours at spring-tides, to the vessel which lay moored off it. The lowest floor of this temporary erection, in which the mortar for the building was prepared, was often broken up and removed by the force of the sea. The foundation having been excavated, the first stone was laid on the 10th July 1808, at the depth of 16 feet below the high-water of spring-tides, and at the end of the second season, the building was 5 feet 6 inches above the lowest part of the foundation. The third season's operations terminated by finishing the solid part of the structure, which is 30 feet in height; and the whole of the masonry was completed in October 1810. The light was first exhibited to the public on the night of the 1st of February 1811. The difficulties and hazards of this work were chiefly caused by the short time during which the rock was accessible between the ebbing and flowing tides; and amongst the many eventful incidents which rendered the history of this work interesting, was the narrow escape which the engineer and thirty-one persons made from being drowned, by the rising of the tide upon the rock, before a boat came to their assistance, the attending vessel having broken adrift. This circumstance occurred before the barrack-house was erected, and is narrated by Mr Stevenson in his account of the work, published at the expense of the Lighthouse Board in 1824, to which we may refer for more minute information on the subject of this work, and the other lights of the coast of Scotland.

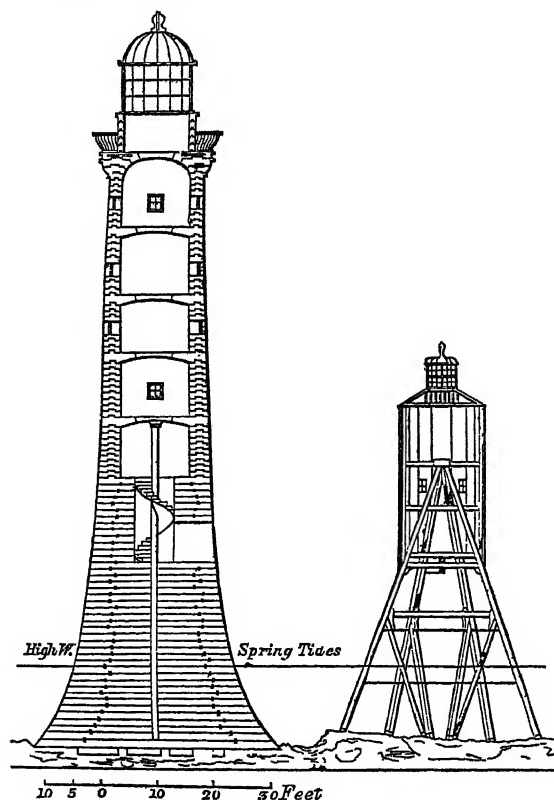


Fig. 3.

The Bell-Rock Tower is 100 feet in height, 42 feet in

diameter at the base, and 15 at the top. The door is 30 feet from the base, and the ascent is by a massive copper ladder. The apartments, including the light-room, are six in number. The light is a revolving red and white light, and is produced by the revolution of a frame containing 20 Argand lamps, placed in the foci of parabolic mirrors, arranged on a quadrangular frame, whose alternate faces have shades of red glass placed before the reflectors, so that a red and white light is shown successively. The machinery, which causes the revolution of the frame containing the lamps, is also applied to tolling two large bells, to give warning to the mariner of his approach to the rock in foggy weather. Fig. 3 shows a section of the Bell-Rock Lighthouse, and of the temporary barrack-house, which was removed on the completion of the work. The entire cost of the lighthouse was L.61,331, 9s. 2d.

The great merit of Mr Stevenson, as architect of the Bell-Rock Lighthouse, lies in his bold conception and unshaken belief in the possibility of erecting a tower of masonry on a reef 12 miles from the nearest land, and covered by every tide,—a situation, undoubtedly, much more difficult than that of the Eddystone. But his mechanical skill in carrying on the work is also deserving of high praise. Not only did he conceive the plan of the *moveable jib* and *balance cranes*, which he afterwards used with much advantage in building the tower; but his zeal, ever alive to the possibility of improving on the conceptions of his great master Smeaton, led him to introduce several beneficial changes into the arrangements of the masonry. In particular, he converted the stone floors of the apartments, which in the Eddystone exert an *outward*, and in its tendency disruptive, thrust, into bonds of union and efficient sources of stability. This thrust was by Smeaton himself considered so disadvantageous, that he thought fit to counteract it, as already noticed, by means of metallic *girders*, concealed in the stone-work, and most ingeniously applied. The Lighthouse Board placed in the upper apartment of the tower a bust of Mr Stevenson, “in testimony,” as the minutes record, “of the sense entertained by the Commissioners of his distinguished talent and indefatigable zeal in the erection of the Lighthouse.”

The most remarkable lighthouse on the coast of Ireland Carlingford is that of Carlingford, near Cranfield Point, at the entrance ford of Carlingford Lough. It was built according to the design of Mr George Halpin, the Inspector of the Irish Lights; and was a work of an arduous nature, being founded twelve feet below the level of high-water on the Hawlbowl Rock, which lies about two miles off Cranfield Point. The figure is that of a frustum of a cone, 111 feet in height, and 48 feet in diameter at the base. The light, which is fixed, is from oil burned in Argand lamps placed in the foci of parabolic mirrors. It was first exhibited on the night of the 20th December 1830.

The Skerryvore Rocks, which lie about 12 miles W.S.W. of the seaward point of the Isle of Tyree, in Argyllshire, were long known as a terror to mariners, owing to the numerous shipwrecks, fatal alike to the vessels and the crews, which had occurred in their neighbourhood. A list, confessedly incomplete, enumerates thirty vessels lost in the forty years preceding 1844; but how many others, which during that period had been reported as “foundered at sea,” or as to whose fate not even an opinion has been hazarded, may have been wrecked on this dangerous reef, which lies so much in the track of the shipping of Liverpool and the Clyde, it would be vain to conjecture.¹ The Commissioners of the Northern Lighthouses had for many years entertained the project of erecting a lighthouse on the Skerry-

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¹ The islanders of Tyree made regular trips after storms to the Rock, and often returned with their boats loaded with *wreck*. Even during the progress of the works, a ship's anchor, and some chain cable much rusted, and other articles, were fished from the hollows of the reef.

Light-houses. vore; and with this object had visited it, more especially in the year 1814, in company with Sir Walter Scott, who, in

through which the sea plays almost incessantly. The cutting of the foundation for the tower in this irregular flinty mass occupied nearly two summers; and the blasting of the rock, in so narrow a space, without any shelter from the risk of flying splinters, was attended with much hazard.

Light-houses.

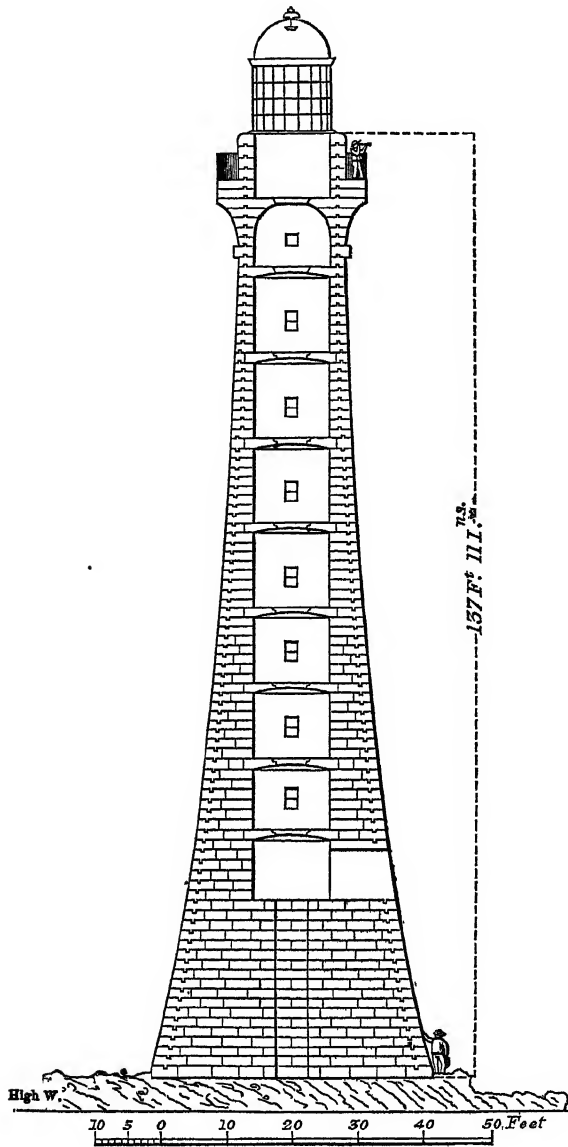


Fig. 4.

his diary, gives a graphic description of its inhospitable aspect. The great difficulty of landing on the rock, which is worn smooth by the continual beat of Atlantic waves, which rise with undiminished power from the deep water near it, held out no cheering prospect; and it was not until the year 1834, when a minute survey of the reef was ordered by the Board, that the idea of commencing this formidable work was seriously embraced.

The reef is composed of numerous rocks, stretching over a surface of nearly 8 miles from W.S.W. to E.N.E. The main *nucleus*, which alone presents sufficient surface for the base of a lighthouse, is nearly 3 miles from the seaward end of the cluster. It is composed of a very compact *gneiss*, worn smooth as glass by the incessant play of the waters, and is so small that at high-water little remains around the base of the tower but a narrow band of a few feet in width, and some rugged humps of rock, separated by gullies,

In such a situation as that of Skerryvore everything was to be provided beforehand and transported from a distance; and the omission in the list of wants of even a little clay for the *tamping* of the mine-holes might for a time have entirely stopped the works. Barracks were to be built at the workyard in the neighbouring Island of Tyree, and also in the Isle of Mull, where the granite for the tower was quarried. Piers were also built in Mull and Tyree for the shipment and landing of materials; and at the latter place a harbour or basin, with a reservoir and sluices for scouring the entrance, were formed for the accommodation of the small vessel which attends the lighthouse. It was, besides, found necessary, in order to expedite the transport of the building materials from Tyree and Mull to Skerryvore Rock, to build a steam-tug, which also served, in the early stages of the work, as a floating barrack for the workmen. In that branch of the service she ran many risks, while she lay moored off the rock in a perilous anchorage, with *two-thirds* of the horizon of *foul ground*, and a rocky and deceitful bottom, on which the anchor often *tripped*.

The operations at Skerryvore were commenced in the summer of 1838, by placing on the rock a wooden barrack, similar to that first used by Mr Robert Stevenson at the Bell-Rock. (See Fig. 3.) The framework was erected in the course of the season on a part of the rock as far removed as possible from the proposed foundation of the lighthouse tower; but in the great gale which occurred on the night of the 3d of November following, it was entirely destroyed and swept from the rock, nothing remaining to point out its site but a few broken and twisted iron stanchions, and attached to one of them a piece of a beam, so *shaken* and rent by dashing against the rock as literally to resemble a bunch of laths. Thus did one night obliterate the traces of a season's toil, and blast the hopes which the workmen fondly cherished of a stable dwelling on the rock, and of refuge from the miseries of sea-sickness, which the experience of the season had taught many of them to dread more than death itself. After the removal of the roughest part of the foundation of the tower had been nearly completed, during almost two entire seasons, by the party of men who lived on board the vessel while she lay moored off the rock, a second and successful attempt was made to place another barrack of the same description, but strengthened by a few additional iron ties, and a centre post, in a part of the rock less exposed to the breach of the heaviest waves than the site of the first barrack had been. This second house braved the storm for several years after the works were finished, when it was taken down and removed from the rock, to prevent any injury from its sudden destruction by the waves. "Perched 40 feet above the wave-beaten rock, in this singular abode," says Mr Alan Stevenson, the engineer, "with a goodly company of thirty men, I have spent many a weary day and night at those times when the sea prevented any one going down to the rock, anxiously looking for supplies from the shore, and earnestly longing for a change of weather favourable to the recommencement of the works. For miles around nothing could be seen but white foaming breakers, and nothing heard but howling winds and lashing waves. At such seasons much of our time was spent in bed; for there alone we had effectual shelter from the winds and the spray, which searched every cranny in the walls of the barrack. Our slumbers, too, were at times fearfully interrupted by the sudden pouring of the sea over the roof, the rocking of the house on its pillars, and the spurting of water

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through the seams of the doors and windows—symptoms which, to one suddenly aroused from sound sleep, recalled the appalling fate of the former barrack, which had been engulfed in the foam not twenty yards from our dwelling, and for a moment seemed to summon us to a similar fate. On two occasions, in particular,” says the engineer, “those sensations were so vivid as to cause almost every one to spring out of bed; and some of the men fled from the barrack, by a temporary gangway, to the more stable but less comfortable shelter afforded by the bare wall of the lighthouse tower, then unfinished, where they spent the remainder of the night in the darkness and the cold.”

The design for the Skerryvore Lighthouse was given by Mr Alan Stevenson, and is an adaptation of Smeaton's Eddystone Tower to the peculiar situation and the circumstances of the case at the Skerryvore, with such modifications in the general arrangements and dimensions of the building as the enlarged views of the importance of lighthouses which prevail in the present day seemed to call for.

The tower is 138 feet 6 inches high, and 42 feet in diameter at the base, and 16 feet at the top. It contains a mass of stone-work of about 58,580 cubic feet, or more than double that of the Bell-Rock, and not much less than five times that of the Eddystone. The lower part of the tower was built by means of *jib-cranes*, and the upper part with *shear-poles*, *needles*, and a balance-crane. The shear-poles were similar to those used by Smeaton at the Eddystone; and the *jib-cranes* and *balance-crane* were the same as those which were designed and first employed by Mr Robert Stevenson in the erection of the Bell-Rock Lighthouse. The mortar used was compounded of equal parts of limestone (from the Halkin Mountain, near Holywell, in North Wales), burnt and ground at the works, and of Pozzolano earth. The light of Skerryvore is revolving, and reaches its brightest state *once every minute*. It is produced by the revolution of eight great annular lenses around a central lamp with four wicks, and belongs to the first order of dioptric lights in the system of Fresnel. The light may be seen from a vessel's deck at the distance of 18 miles. The entire cost of the lighthouse, including the purchase of the steam-vessel, and the building of the harbour at Hynish for the reception of the small vessel, which now attends the lighthouse, was L.86,977, 17s. 7d.

“In such a situation as the Skerryvore,” says the engineer, “innumerable delays and disappointments were to be expected by those engaged in the work; and the entire loss of the fruit of the first season's labour in the course of a few hours was a good lesson in the school of patience, and of trust in something better than an arm of flesh. During our progress, also, cranes and other materials were swept away by the waves; vessels were driven by sudden gales to seek shelter at a distance from the rocky shores of Mull and Tyree; and the workmen were left on the rock desponding and idle, and destitute of many of the comforts with which a more roomy and sheltered dwelling, and the neighbourhood of friends, are generally connected. Daily risks were run in landing on the rock in a heavy surf, in blasting the splintery gneiss, or by the falling of heavy bodies from the tower on the narrow space below, to which so many persons were necessarily confined. Yet had we not any loss of either life or limb; and although our labours were prolonged from dawn to night, and our provisions were chiefly salt, the health of the people, with the exception of a few slight cases of dysentery, was generally good throughout the six successive summers of our sojourn on the rock. The close of the work was welcomed with thankfulness by all engaged in it; and our remarkable preservation was viewed, even by many of the most thoughtless, as, in a peculiar manner, the gracious work of Him by whom ‘the very hairs of our heads are all numbered.’”

There can be little doubt that, down to a very late period, the only mode of illumination adopted in the lighthouses, even of the most civilized nations of Europe, was the combustion of wood or coal in a chauffer on the top of a high tower. It is needless to enlarge upon the evils of such a method; they need only be named to be understood; for it is difficult to conceive how an efficient system of lighting a coast could be managed under such disadvantages. The uncertainty caused by the effects of wind and rain, and the impossibility of rendering one light distinguishable from another, must have at all times rendered the early lighthouses in a great measure useless to the mariner.

Light-houses.

Method of illumination.
Coal lights

M. Teulère, a member of the Royal Corps of Engineers of Bridges and Roads in France, is, by some, considered the first who hinted at the advantages of parabolic reflectors; and he is said, in a memoir dated the 26th June 1783, to have proposed their combination with Argand lamps, ranged on a revolving frame, for the Corduan lighthouse. Whatever foundation there may be for the claim of M. Teulère, certain it is, that this plan was actually carried into effect at Corduan under the directions of the Chevalier Borda, and to him is generally awarded the merit of having conceived the idea of applying parabolic mirrors to lighthouses. These were prodigious steps in the improvement of lighthouses, as not only the power of the lights was thus greatly increased, but the introduction of a revolving frame proved a valuable source of distinction amongst lights, and has since been the means of greatly extending their utility. The exact date of the change on the light of the Corduan is not known; but as it was made by Lenoir, the same young artist to whom Borda, about the year 1780, intrusted the construction of his reflecting circle, it has been conjectured by some that the improvement was made about the same time. If this conjecture be correct, the claim of M. Teulère must of course fall to the ground. The reflectors were formed of sheet copper, plated with silver, and had a double ordinate of 31 French inches. It was not long before these improvements were adopted in England by the Trinity House of London, who sent a deputation to France to inquire into their nature. In Scotland, one of the first acts of the Northern Lights Board, in 1786, was to substitute reflectors in the room of coal lights, then in use at the Isle of May in the Firth of Forth, and the Cumbrae Isle in the Firth of Clyde, which had, till that period, been the only beacons on the Scotch coast. The reflectors employed were formed of facets of mirror glass, placed in hollow parabolical moulds of plaster, according to the designs of the late Mr Thomas Smith, the engineer of the Board, who, as appears from the article *Reflector* in the Supplement to the third edition of the Encyclopædia Britannica, was not aware of what had been done in France, and had, himself, conceived the idea of this combination. The system of Borda was also adopted in Ireland; and, in time, variously modified, it became general wherever lighthouses were known.

The property of the parabola, by which all lines incident on its surface from the focus make with normals to the curve at the points of incidence, angles equal to the inclination of these same normals respectively to lines drawn parallel to the axis of the curve, is that which fits it for the purposes of a lighthouse. A hollow mirror, formed by the revolution of a portion of a parabola about its axis, has, in consequence of this property, the power of projecting the repeated images of a luminous point placed in its focus, in directions parallel to the axis of the generating curve; so that, when the mirror is placed with its axis parallel to the horizon, a cylindric beam of light is thereby sent forward in a horizontal direction. When such mirrors are placed side by side, with their axes parallel on the faces of a quadrangular frame which revolves about a vertical axis, a distant observer receives the successive impressions which result from the pas-

Catoptric system.

Parabolic mirrors.

Light-houses.

sage of each face of the frame, over a line drawn between the observer's eye and the centre of the revolving frame. This arrangement constitutes what is called a revolving light. A fixed light is produced by placing, side by side, round a circular frame, a number of reflectors, with their axes inclined to each other, so as to be radii containing equal arcs of the frame on which they are placed. It is obvious that a perfect parabolic figure, and a luminous *point* mathematically true, would render the illumination of the whole horizon by means of a fixed light *impossible*; and it is only from the aberration caused by the size of the flame which is substituted for the point, that we are enabled to render even revolving lights practically useful. But for this aberration, even the slowest revolution in a revolving light, which would be consistent with a continued observable series, such as the practical seaman could follow, would render the flashes of a revolving light greatly too transient for any useful purpose; whilst fixed lights, being visible in the azimuths only in which the mirrors are placed, would, over the greater part of the distant horizon, be altogether invisible. The size of the flame, therefore, which is placed in the focus of a parabolic mirror, when taken in connection with the form of the mirror itself, leads to those important modifications in the paths of the rays, and the form of the resultant beam of light, which have rendered the catoptric system of lights so great a benefit to the benighted seaman.

It is obvious, from a consideration of the nature of the action which takes place in this combination of the paraboloidal mirrors with Argand lamps, that the revolving light is not only more perfect in its nature than the fixed light, but that it possesses the advantage of being susceptible of an increase of its power, by increasing the number of reflectors, which have their axes parallel to each other, so as to concentrate the effect of several mirrors in one direction. The perfect parallelism of the axes of separate mirrors, it is true, is unattainable, but approaches may be made sufficiently near for practical results; and in order to prolong the duration of the flash, the reflectors are sometimes placed on a frame, having each of its sides slightly convex, by which arrangement the outer reflectors of each face of the frame have their axes less inclined inwards from the radii of the revolving frame which pass through their foci.

The best proportions for the paraboloidal mirrors depend upon the object to which they are to be applied; as mirrors which are intended to produce great divergence in the form of the resultant beam should have one form; whilst those which are designed to cause a near approach to parallelism of the rays will have another form. These objects may also be attained by variations of the size of the flame applied in the same mirror; but it is much more advantageous to produce the effect by a change in the form of the mirror, as any increase of the flame beyond the size which is found to be most advantageous in other respects cannot be regarded otherwise than as a wasteful expenditure of light. The details into which a full investigation of this matter would lead us are quite beyond the scope of this article, and it therefore seems sufficient to give the formulæ which express the relations which exist between the size of the flame, the reflecting surface, and the corresponding divergence of the reflected ray. If Δ represent the inclination of any reflected ray to the axis of a paraboloidal mirror, e the distance of the focus from the point of reflection, and d the distance from the edge of the flame to the focus in

the plane of reflection, we shall have $\sin \Delta = \frac{d}{e}$; and when

the flame in the given plane of reflection is circular, or has its opposite sides equidistant from the focus of the mirror, we shall, by putting Δ' for the effective divergence of the mirror in the given plane, have $\Delta' = 2\Delta$. When, there-

fore, great divergence, as in the case of the fixed lights, is required, the prolate form of the curve is to be preferred; and the oblate is conversely more suited to revolving lights.

The power of the reflectors ordinarily employed in light-houses is generally equal to about 360 times the effect of the unassisted flame which is placed in the focus. This value, however, is strictly applicable only at the distances at which the observations have been made, as the proportional value of the reflected beam must necessarily vary with the distance of the observer, agreeably to some law dependent upon the unequal distribution of the light in the luminous cone which proceeds from it. The ordinary burners used in lighthouses are one inch in diameter, and the focal distance generally adopted is four inches, so that the effective divergence of the mirror in the horizontal plane may be estimated at about $14^{\circ} 22'$. In arranging reflectors on the frame of a fixed light, however, it would be advisable to calculate upon less effective divergence, for beyond 11° the light is feeble; but the difficulty of placing many mirrors on one frame, and the great expense of oil required for so many lamps, have generally led to the adoption of the first valuation of the divergence.

The reflectors used in the best lighthouses are made of sheet copper plated, in the proportion of 6 oz. of silver to 16 oz. of copper. They are moulded to the paraboloidal form by a delicate and laborious process of beating with mallets and hammers, of various forms and materials, and are frequently tested during the operation by the application of a carefully-formed mould. After being brought to the curve, they are stiffened by means of a strong beazle, and a strap of brass, which is attached to it for the purpose of preventing any accidental alteration of its figure. Polishing powders are then applied, and the instrument receives its last finish.

Two gauges of brass are applied to test the form of the reflector. One is for the back, and is used by the workmen during the process of hammering, and the other is applied to the concave face as a test, while the mirror is receiving its final polish. It is then tested, by trying a burner in the focus, and measuring the intensity of the light at various points of the reflected conical beam. Another test may also be applied successively to various points in the surface, by masking the rest of the mirror. Having placed a screen in the line of the axis of the mirror at some given distance from it, it is easy to find whether the image of a very small object placed in the conjugate focus, which is due to the distance of the screen, be reflected at any distance from that point on the centre of the screen through which the prolongation of the axis of the mirror would pass, and thus to obtain a measure of the error of the instrument. For this purpose it is necessary to find the position of the conjugate focus, which corresponds to the distance of the screen. If b be the distance which the object should be removed outwards from the principal focus of the mirror, d the distance from the focus to the screen, and r the distance from the focus to the point of the mirror which is

to be tested, we shall have $b = \frac{r^2}{d}$ as the distance which the

object must be removed outwards from the true focus on the line of the axis.

The flame generally used in reflectors is from an Argand fountain-lamp, whose wick is an inch in diameter. Much care is bestowed upon the manufacture of these lamps for the Northern Lighthouses, which have their burners tipped with silver, to prevent wasting by the great heat which is evolved. These burners are also fitted with a slide apparatus, accurately formed, by which the burner may be removed from the interior of the mirror at the time of cleaning it, and returned exactly to the same place, and locked

Light-houses.

Power of paraboloidal mirrors.

Manufacture and testing of reflectors.

Proportions and divergence of paraboloidal mirrors.

Light-houses.

by means of a key. This arrangement, which is shown in figs. 5, 6, and 7, is very important, as it ensures the burner always being in the focus, and does not require the reflector to be lifted out of its place every time it is cleaned; so that, when once carefully set and screwed down to the frame, it is never altered. In these figs. *aaa* represents one of the reflectors, *b* is the lamp, *c* is a cylindric fountain, which contains 24 oz. of oil. The oil-pipe and fountain of the former is connected with the rectangular frame *d*, and is moveable in a vertical direction upon the guide-rods *e* and *f*, by which it can be let down and taken out of the reflector by simply turning the handle *g*, as will be more fully understood by examining fig. 6. An aperture of an elliptical form, measuring about 2 inches by three, is cut in the upper and lower part of the reflector, the lower serving for the free egress and ingress of the lamp, and the upper, to which the copper tube *h* is attached, serving for ventilation; *i* shows a cross section of the main bar of the chandelier or frame, on which the reflectors are ranged, each being made to rest on knobs of brass, one of which is seen at *h*, and which are soldered on the brass band *l*, that clasps the exterior of the reflector. Fig. 5 is a section of the reflector *aa*, showing the position of the burner *b*, with the glass chimney *b'*; and oil-cup *l*, which receives any oil that may drop from the lamp. Fig. 6 shows the apparatus for moving the lamp up and down, so as to remove it from the reflector at the time of cleaning it. In the diagram, *c*, the fountain, is moved partly down; *dd'* shows the rectangular frame on which the burner is mounted, *e, e* the elongated socket-guides, *f* the rectangular guide-rod, connected with the perforated sockets on which the checking-handle *g* slides.

Arrangement of reflectors on the frame.

The modes of arranging the reflectors in the frames are shown in figs. 8, 9, and 10. It seems quite unnecessary, after what is said on the subject of divergence, to do more than remark, that in revolving lights the reflectors are placed with their axes parallel to each other, so as to concentrate their power in one direction; whilst in fixed lights it is necessary, in order to effect as equal a distribution of the light over the horizon, as possible, to place the reflectors, with their axes inclined to each other at an angle somewhat less than that of the divergence of the reflected cone. For this purpose a brass gauge, composed of two long arms, somewhat in the form of a pair of common dividers, connected by means of a graduated limb, is employed. The arms having been first placed at the angle, which is supplemental to that of the inclination of the axes of the two adjacent mirrors, are made to span the faces of the reflectors, one of which is moved about till its edges are in close contact with the flat surface of one of the arms

of the gauge. The different arrangements of the reflectors will be more fully understood by referring to the figures.

Light-houses.

Figs. 8 and 10 show an elevation and plan of a revolving apparatus on the catoptric principle. In these figures, *nn*, shows the reflector frame or chandelier; *o, o*, the reflectors with their oil-fountains *p, p*. The whole is attached to the revolving axis or shaft *q*. The copper tubes, *r, r*, convey the smoke from the lamps; *s, s* are cross bars which support the shaft at *tt*; *uu* is a copper pan for receiving any moisture which may accidentally enter at the central ventilator in the roof of the light-room; *l* is a cast-iron bracket, which supports the pivot on the shaft; *m, m* are bevelled wheels, which convey motion from the machine to the shaft. Fig. 9 shows a plan of one tier of reflectors arranged in the manner employed in a fixed catoptric light; *nn* shows the chandelier, *q* the fixed shaft in the

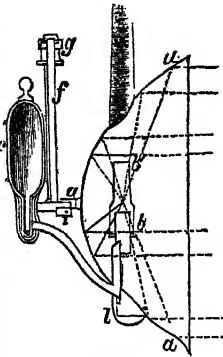


Fig. 5.

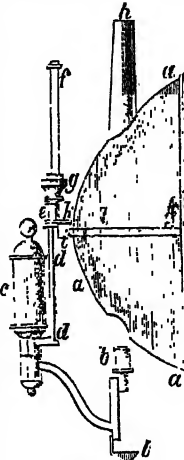


Fig. 6.

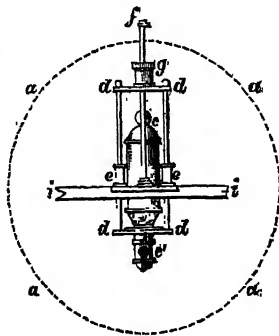


Fig. 7.

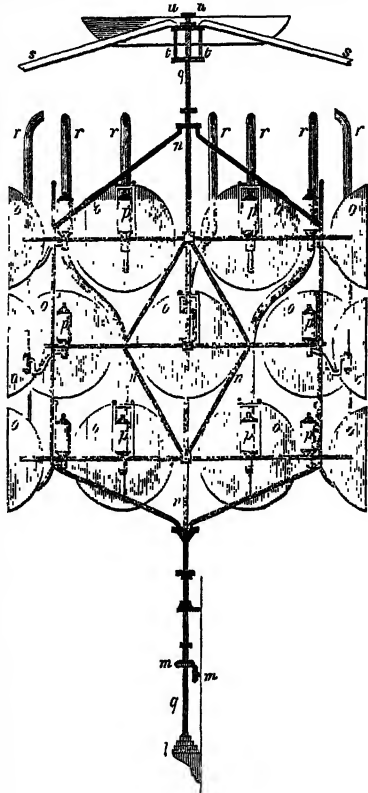


Fig. 8.

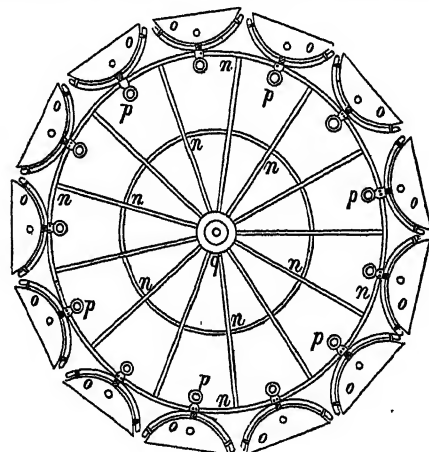


Fig. 9.

centre, which supports the whole, *o, o* the reflectors, and *p, p* the fountains of their lamps.

A variety of the parabolic reflectors has been invented by M. Bordier Marcet, the pupil and successor of Argand, who has laboured with much enthusiasm in perfecting catoptric instruments, more especially with a view to their application to the illumination of lighthouses and the streets of towns. Amongst many other ingenious combinations of parabolic mirrors, he has invented and constructed an apparatus, which is much used in harbour-lights on the French coast. The object of this apparatus is to fulfil, as economically as possible, the conditions required in a fixed light, by illuminating, with perfect equality, every part of the horizon, by means of a single burner; and M. Bordier

Bordier Marcet's reflectors.

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Marcet has in his workshop an instrument of this kind, 8 feet in diameter, which he constructed on speculation. The apparatus used in harbour-lights, on the French coast, is of much smaller dimensions, and does not exceed 15 inches in diameter. A perfect idea of the construction and effect of this apparatus may be formed by conceiving a parabola to revolve about its parameter as an axis, so that its upper and lower limbs would become the generating lines of two surfaces possessing the property of reflecting, in lines parallel to the axis of the parabola, all the rays incident upon them, from a light placed in the point where the parameter and axis of the generating parabola intersect each other. This point being the focus of each parabolic section of this apparatus, the light is equally dispersed in every point of the horizon, when the axes of the parabolic sections are in a plane perpendicular to a vertical line. But, however perfectly this apparatus may attain this important object, it does so at the sacrifice of the most efficient part of the parabolic surface, which lies between the vertex and the parameter; and therefore produces a proportionally feeble effect. This beautiful little instrument is shown in fig. 11, in which *b* shows the burner, *pp*

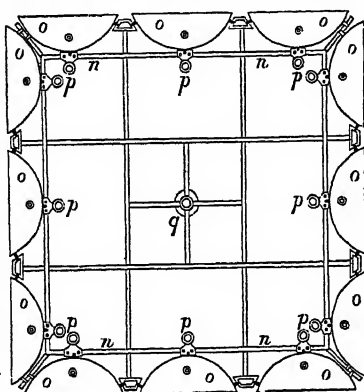


Fig. 10

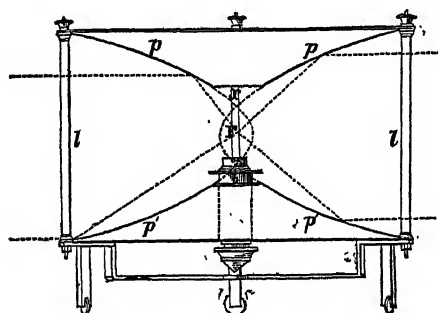


Fig. 11.

the upper reflecting surface, and *p'p'* the lower reflecting surface, both generated in the manner above described, by the revolution of a parabola, about its parameter *ab*; *F* is the focus of the generating parabola; and *l, l* are small pillars which connect the two reflecting plates, and give strength to the apparatus.

Spherical mirrors.

Spherical mirrors are employed in lighthouses only as subsidiary parts in dioptric apparatus; and any observations regarding them will, therefore, be made in treating of the dioptric lights of Fresnel.

Floating lights.

Floating lights are only resorted to in cases of absolute necessity, as their maintenance is extremely expensive, whilst they are less to be relied on, and, in all respects, less efficient than land lights. They are large vessels, built with great breadth of beam, and are generally moored off shoals, or serve as guides for taking channels. The lights are from lamps placed in front of small reflectors, ranged in lanterns which are hoisted on the masts of the vessel.

Catoptric lights are susceptible of nine separate distinctions, which are called *fixed, revolving white, revolving red and white, revolving red with two whites, revolving white with two reds, flashing, intermittent, double fixed lights, and double revolving lights*. The first exhibits a steady and uniform appearance, which is not subject to any change; and the reflectors used for it are of smaller dimensions than those employed in revolving lights. This is necessary, in order to permit them to be ranged round the circular frame, with their axes inclined at such an angle as shall enable them to illuminate every point of the horizon. The revolving light is produced by the revolution of a frame with three or four sides, having reflectors of a large size grouped on each side, with their axes parallel; and as the revolution exhibits a light gradually increasing to *full strength*, and in the same gradual manner decreasing to total darkness, its appearance is extremely well marked. The succession of *red and white* lights is caused by the revolution of a frame whose different sides present red and white lights; and these, as already mentioned, afford three separate distinctions, namely, alternate red and white; the succession of two white lights after one red; and the succession of two red lights after one white light. The *flashing* light is produced in the same manner as the *revolving* light; but owing to a different construction of the frame, and the greater quickness of the revolution, a totally different and very striking effect is produced. The brightest and darkest periods being but momentary, this light is characterized by a rapid succession of bright flashes, from which it gets its name. The *intermittent* light is distinguished by bursting suddenly into view, and continuing steady for a short time, after which it is suddenly eclipsed for half a minute. Its striking appearance is produced by the perpendicular motion of circular shades in front of the reflectors, by which the light is alternately hid and displayed. This distinction, as well as that called the *flashing light*, are peculiar to the Scotch coast, having been first introduced by Mr R. Stevenson, the late engineer of the Northern Lights Board. The double lights, which are generally used only where there is a necessity for a *leading* line, as a guide for taking some channel, or avoiding some danger, are exhibited from two towers, one of which is higher than the other; and when seen in one line, form a direction for the course of shipping. At the Calf of Man a striking variety has been introduced into the character of leading lights, by substituting for two *fixed* lights, two lights which revolve in the same periods, and exhibit their flashes at the same instant; and these lights are, of course, susceptible of the other variety enumerated above, that of two revolving red and white lights revolving in equal periods. The utility of all these distinctions is chiefly to be imputed to their at once striking the eye of an observer, and being instantaneously obvious to strangers.

Light-houses.

Before entering upon the subject of the dioptric lights,¹ Dioptric the writer of this article embraces with pleasure the opportunity afforded to him of acknowledging the liberality of M. Fresnel. Léonor Fresnel, the late Secretary of the Lighthouse Commission of France. It was entirely owing to the readiness with which M. Fresnel afforded him access to every avenue of information on the subject of lighthouses that he was enabled to effect the object of a mission to France, on which he was sent in the year 1834, by the Commissioners of Northern Lights.

The first proposal of applying lenses to lighthouses is recorded by Smeaton in his account of the Eddystone Lighthouse, where he mentions that, in 1759, an optician in London proposed grinding the glass of the lantern to a

¹ In all probability directly derived from the Greek *διόπτρον*, an optical instrument with holes for looking through, which is a compound of *διὰ*, through, and *σκοπεῖν*, I see.

Light-houses.

radius of seven feet six inches; but the description is too vague to admit of even a conjecture regarding the proposed arrangement of the apparatus. About forty years ago, however, lenses were actually tried in several light-houses in the south of England; but their imperfect figure, and the quantity of light absorbed by the glass, which was of inferior quality and of considerable thickness, rendered their effect so much inferior to that of the parabolic reflectors then in use, that, after trying some strange combinations of lenses and reflectors, the former were finally abandoned.

The object to be attained by the use of lenses in a light-house is, of course, identical with that which is answered by employing reflectors; and both instruments effect the same end by different means, collecting the rays which diverge from a point called the *focus*, and projecting them forward in a beam, whose axis coincides with the produced axis of the instrument. The actions by which these similar results are effected have been termed *reflection* and *refraction*. In the one case the light, as has been already said, merely impinges on the reflecting surface, and is thrown back; whilst in the other, the rays pass through the refracting medium, and are bent or refracted from their natural course.

Polyzonal lenses.

The celebrated Buffon, to prevent the great absorption of light by the thickness of the material, which would necessarily result from giving to a lens of great dimensions a figure continuously spherical, proposed to grind out of a solid piece of glass a lens in steps or concentric zones. This suggestion of Buffon, regarding the construction of large burning glasses, was first executed; with tolerable success, about the year 1780, by the Abbé Rochon; but such are the difficulties attending the process of working a solid piece of glass into the necessary form, that it is believed the only other instrument ever constructed in this manner is that which was made by Messrs Cookson of Newcastle-upon-Tyne, for the Commissioners of Northern Lighthouses.

The merit of having first suggested the building of these lenses in separate pieces seems to be due to Condorcet, who in his *Eloge de Buffon*, published so far back as 1773, enumerates the advantages to be derived from this method.¹ Sir David Brewster also described this mode of building lenses in 1811, in the *Edinburgh Encyclopædia*; and in 1822, the late eminent Fresnel, alike unacquainted with the suggestions of Condorcet, or the description by Sir David Brewster, explained, with many ingenious and interesting details, the same mode of constructing these instruments. To Fresnel belongs the additional merit of having first followed up his invention by the construction of a lens, and, in conjunction with MM. Arago and Mathieu, of placing a powerful lamp in its focus, and, indeed, of finally applying it to the practical purposes of a lighthouse. The fertile genius of the French Academician has produced many ingenious combinations of dioptric instruments for light-houses, which we shall have occasion to notice in the sequel.

Annular lenses.

The great advantages which attend the mode of construction proposed by Condorcet are, the ease of execution, by which a more perfect figure may be given to each zone, and spherical aberration almost entirely corrected, and the power of forming a lens of larger dimensions than could easily be made from a solid piece. Buffon appears only to have had in view the reduction of the thickness of the lens, but Condorcet distinctly suggests the possibility of correcting the spherical aberration by properly selected centres for the various zones.

To Fresnel, however, is due the credit of having determined these centres, which constantly recede from the axis of the lens in proportion as the zones to which they refer are removed from its centre; and the surfaces of

the zones of the annular lens, consequently, are not parts of concentric spheres, as in Buffon's lens. It deserves notice, that the first lenses constructed for Fresnel by M. Soleil had their zones polygonal, so that the surfaces were not annular, a form which Fresnel considered less accommodated to the ordinary resources of the optician. He also, with his habitual penetration, preferred the plano-convex to the double-convex form, as more easily executed. After mature consideration, he finally adopted crown glass, which, notwithstanding its greenish colour, he considered more suitable than flint glass, as being less liable to *strizæ*. All his calculations were made in reference to an index of refraction of 1.51, which he had verified by repeated experiments, conducted with that patience and accuracy for which, amidst his higher qualities, he was so remarkably distinguished. These instruments have received the name of *annular lenses*, from the figure of the surface of the zones.

Light-houses

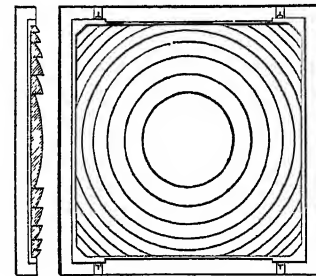


Fig. 12.

Fig. 12 exhibits a plan and section of an annular lens of the largest size, whose focal distance is 92 centimetres, or about 36.22 inches, and which subtends a luminous pyramid of 46° of inclination, having its apex in the flame.

Having once contemplated the possibility of illuminating lighthouses by dioptric means, Fresnel quickly perceived the advantage of employing for fixed lights a lamp placed in the centre of a polygonal hoop, consisting of a series of cylindric refractors, *infinitely small* in their length, and having their axes in planes parallel to the horizon.

Such a continuation of vertical cylindric sections of various curvatures, by refracting the rays proceeding from the focus only in a direction perpendicular to the vertical sections of the cylindric parts, must distribute a zone of light *equally brilliant* in every point of the horizon. This effect will be easily understood, by considering the middle vertical section of one of the great annular lenses or burning glasses, already described, abstractly from its relation to the rest of the instrument. It will readily be perceived that this section possesses the property of refracting the rays in the vertical plane only, without interfering with azimuthal divergence; and if this section, by its revolution about a vertical axis, becomes the generating line of the enveloping hoop above noticed, such a hoop would of course possess the property of refracting an equally diffused zone of light round the horizon. The difficulty, however, of forming this apparatus, appeared so great, that Fresnel determined to substitute for it a vertical polygon, composed of what have been improperly called *cylindric lenses*, but which in reality are mixtilinear and horizontal prisms, distributing the light which they receive from the focus equally over the horizontal sector which they subtend. This polygon has a sufficient number of sides to enable it to give, at the angle formed by the junction of two of them, a light not very much inferior to what is produced by one of the sides; and upper and lower courses of curved mirrors are so placed as to make up for the deficiency of the light at the angles. The effect sought for in a fixed light is thus obtained in a much more perfect manner than by any combination of the parabolic mirrors formerly used in the British light-houses.

An ingenious modification of the fixed apparatus is due

¹ *Eloge de Buffon*, p. 35; *Œuvres de Condorcet*, tom. iv., Paris, 1804.

Light-houses.

to the inventive mind of Fresnel, who conceived the happy idea of placing one apparatus of this kind in front of another, with the axes of the cylindric pieces crossing each other at right angles. As these cylindric pieces have the property of refracting all the rays which they receive from the focus into a direction perpendicular to the mixtilinear section which generates them, it is obvious that, if two refracting media of this sort be arranged as proposed by Fresnel, their joint action will unite the rays which come from their common focus into a beam, whose sectional area is equal to the overlapped surface of the two instruments, and thus produce the effect of an annular lens. It was by availing himself of this property of crossed prisms that Fresnel invented the distinction for lights, which he calls a *fixed light varied by flashes*; in which the flashes are caused by the revolution of cylindric media, with vertical axes round the fixed-light apparatus already described.

The modification just described is shown at fig. 16. This instrument is, however, now supplanted by a revolving apparatus, consisting of alternate sections of a fixed light apparatus, and a Holophotal apparatus to be afterwards described. By the revolution of this composite apparatus the same effect is obtained, while the flash is produced by the action of a *single* optical agent, instead of by two, as in Fresnel's arrangement.

Mechanical lamp.

Fresnel immediately perceived the necessity of combining, with the dioptric instruments which he had invented, a burner capable of producing a large volume of flame; and the rapidity with which he matured his notions on this subject, and at once produced an instrument admirably adapted for the end he had in view, affords one of the many proofs of that happy union of practical with theoretical talent for which he was so distinguished. Fresnel himself has modestly attributed much of the merit of the invention of this lamp to M. Arago; but that gentleman, with great candour, gives the whole credit to his deceased friend, in a notice regarding lighthouses, which appeared in the *Annuaire du Bureau des Longitudes* of 1831. The lamp has four concentric burners, which are defended from the action of the excessive heat produced by their united flames by means of a superabundant supply of oil which is thrown up from the cistern below by a clock-work movement, and constantly overflows the wicks, as in the mechanical lamp of Carcel. A very tall chimney is found to be necessary, in order to supply fresh currents of air to each wick with sufficient rapidity to support the combustion. The carbonization of the wicks, however, is by no means so rapid as might be expected, and it is even found that, after they have suffered a good deal, the flame is not sensibly diminished, as the great heat evolved from the mass of flame promotes the rising of the oil in the cotton. So perfect, indeed, is the action of this great lamp, that it has been known to burn for upwards of twelve hours without being snuffed, or even having the wicks raised.

The annexed diagrams will give a more perfect idea of the nature of the concentric burner than can easily be conveyed by words alone.

Fig. 13 shows a plan of a burner of four concentric wicks. The intervals which separate the wicks from each other, and allow the currents of air to pass, diminish in width a little as

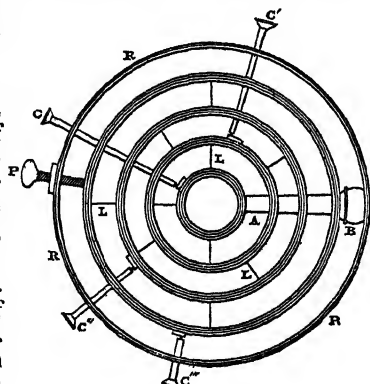


Fig. 13.

they recede from the centre. Fig. 14 shows a section of this burner. C, C', C'', C''' are the rack handles for raising or depressing each wick. AB is the horizontal duct which leads the oil to the four wicks; L, L', L'', L''' are small plates of tin by which the burners are soldered to each other, and which are so placed as not to hinder the free passage of the air; P is a clamping screw which keeps at the proper height the gallery R, R which carries the chimney. Fig. 15 shows the burner with its glass chimney and damper. E is the glass chimney, F is a sheet-iron cylinder, which serves to give it a greater length, and has a small damper D, capable of being turned by a handle for regulating the supply of air; and B is the pipe which supplies the oil to the wicks. The great risk in using this lamp arises from the leather valves, that force the oil by a clock-work movement, being occasionally liable to derangement; and several of the lights on the French coast, and more especially the Corduan, have been extinguished for a few minutes by the failure of the lamp, an accident which has never, and scarcely can happen with the fountain lamps which illuminate the reflectors. To prevent the occurrence of such accidents, and to render their consequences less serious, various precautions have been resorted to. Amongst others, an alarm is attached to the lamp, consisting of a small cup pierced in the bottom, which receives part of the overflowing oil from the wicks, and is capable, when full, of balancing a weight placed at the opposite end of a lever. The moment the machinery stops, the cup ceases to receive the supply of oil, and the remainder running out at the bottom, the equilibrium of the lever is destroyed, and, in falling, it disengages a spring which rings a bell sufficiently loud to waken the keeper, should he chance to be asleep. There is another precaution of more importance, which consists in having always at hand in the light-room a spare lamp trimmed and adjusted to the height for the focus, which may be substituted for the other in case of accident. It ought to be noticed, however, that it takes about twenty minutes from the time of applying the light to the wicks to bring the flame to its full strength, which, in order to produce its best effect, should stand at the height of nearly four inches (10^{cm.}). The inconveniences attending this lamp have led to several attempts to improve it; and amongst others M. Delaveleye has proposed to substitute a pump having a metallic piston, in place of the leather valves, which require constant care, and must be frequently renewed. A lamp was constructed in this manner by M. Lepaute, and tried at Corduan; but it was afterwards discontinued until some further improvements could be made upon it. It has lately been much improved by M. Wagner, an ingenious artist whom M. Fresnel employed to carry some of his improvements into effect. In the dioptric lights on the Scotch coast, a common lamp with

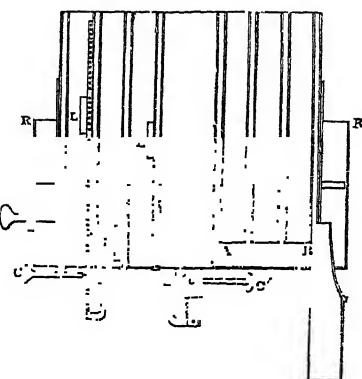


Fig. 14.

Fig. 15 shows the burner with its glass chimney and damper. E is the glass chimney, F is a sheet-iron cylinder, which serves to give it a greater length, and has a small damper D, capable of being turned by a handle for regulating the supply of air; and B is the pipe which supplies the oil to the wicks. The great risk in using this lamp arises from the leather valves, that force the oil by a clock-work movement, being occasionally liable to derangement; and several of the lights on the French coast, and more especially the Corduan, have been extinguished for a few minutes by the failure of the lamp, an accident which has never, and scarcely can happen with the fountain lamps which illuminate the reflectors. To prevent the occurrence of such accidents, and to render their consequences less serious, various precautions have been resorted to. Amongst others, an alarm is attached to the lamp, consisting of a small cup pierced in the bottom, which receives part of the overflowing oil from the wicks, and is capable, when full, of balancing a weight placed at the opposite end of a lever. The moment the machinery stops, the cup ceases to receive the supply of oil, and the remainder running out at the bottom, the equilibrium of the lever is destroyed, and, in falling, it disengages a spring which rings a bell sufficiently loud to waken the keeper, should he chance to be asleep. There is another precaution of more importance, which consists in having always at hand in the light-room a spare lamp trimmed and adjusted to the height for the focus, which may be substituted for the other in case of accident. It ought to be noticed, however, that it takes about twenty minutes from the time of applying the light to the wicks to bring the flame to its full strength, which, in order to produce its best effect, should stand at the height of nearly four inches (10^{cm.}). The inconveniences attending this lamp have led to several attempts to improve it; and amongst others M. Delaveleye has proposed to substitute a pump having a metallic piston, in place of the leather valves, which require constant care, and must be frequently renewed. A lamp was constructed in this manner by M. Lepaute, and tried at Corduan; but it was afterwards discontinued until some further improvements could be made upon it. It has lately been much improved by M. Wagner, an ingenious artist whom M. Fresnel employed to carry some of his improvements into effect. In the dioptric lights on the Scotch coast, a common lamp with

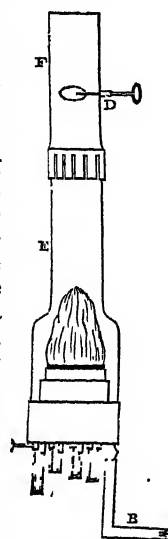


Fig. 15.

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a large wick is kept constantly ready for lighting; and in the event of the sudden extinction of the mechanical lamp by the failure of the valves, it is only necessary to unscrew and remove its burner, and put the reserve-lamp in its place. The height of this lamp is so arranged, that its flame is in the focus of the lenses, when the lamp is placed on the ring which supports the burner of the mechanical lamp; and as its flame, though not very brilliant, has a considerable volume, it will answer the purpose of maintaining the light for an hour or two until the light-keepers have time to repair the valves of the mechanical lamp.

Divergence of the annular lenses.

The divergence of the annular lens is greatly less than that of the parabolic mirror. It may be estimated in the following manner. Let Δ be the angle of divergence of any ray emerging from the lens, l the distance of the point of incidence from the principal focus of the lens, and r the radius of the flame, and we have $\sin. \Delta = \frac{r}{l}$, and when Δ' is made the angle of the effective divergence of the lens, we have $\Delta' = 2\Delta$.

Adopting this rule, we find the effective divergence of the lens to be about $5^\circ 9'$, which does not differ much from the observed divergence.

Manufacture of dioptric instruments.

The manufacture of the dioptric instruments is not distinguished by any peculiarity which requires special notice, the grinding and polishing being performed by means of powders gradually increasing in fineness, successively applied as in the ordinary process of grinding glass. The zones are united by a glue which possesses the important property of being able to resist the action of considerable heat, whilst it is by no means brittle. M. Fresnel intrusted the work of building the first lens to the late M. Soleil, optician to the King of France, to whose zeal and intelligence he bears ample testimony in the *Memoire*, in which he describes the invention.

Testing of lenses.

In order to test the figure of the lenses, moulds carefully made may be applied; or the lens being mounted on a stand which permits its being set at any angle, the accuracy of the whole instrument, and of each portion of it, may be separately tested by the form and size of the spectrum which is formed in the principal focus, by permitting the solar rays to fall upon the lens at right angles. When any particular portion is to be tried, the rest of the surface is covered with discs of strong grey paper or pasteboard. Another method may be employed similar to that already described as applicable to reflectors. This method consists in finding whether a small object placed in any point of the axis farther from the lens than the principal focus, has its image refracted accurately to a point on a screen placed in the conjugate focus which is due to that distance. The same principle of testing the instrument is also applied when a person stationed at a given short distance in front of the lens observes whether its whole surface be completely illuminated by a small flame placed in the conjugate focus corresponding to that distance. All that is necessary, therefore, is to determine these distances by means of formulæ which express the relations of the distances of the object and its image. If δ represent the distance of the eye from the lens, ϕ the principal focus, and ϕ' the distance of the conjugate focus corresponding to the observer's distance δ , then we have $\phi' = \frac{\delta\phi}{\delta - \phi}$.

If, again, adopting the same notation, we wish to find the distance at which the image of an object placed at a given distance from the lens greater than that of the principal focus, should be accurately impressed on a screen, we have $\delta = \frac{\phi\phi'}{\phi' - \phi}$.

Curved mirrors.

The curved mirrors, placed above and below the lenses as a supplement to them, are, strictly speaking, generated by portions of parabolas having their foci coincident with

the common flame of the system. In practice, however, they are made portions of a curve surface, ground by the radius of the circle which osculates the given parabola, and passes tangentially through the middle of the chord which subtends the arc of the mirror. These mirrors are plates of glass, silvered on the back, and set in flat cases of sheet brass. They are suspended on a circular frame of screws, which are attached to the backs of the cases, and which afford the means of adjusting them to their true position in the light-room, so that they may reflect the horizon of the lighthouse to an observer's eye placed in the focus of the system. In order to test the accuracy of the mirrors, recourse may again be had to the formulæ of conjugate foci; thus, if we put r equal to the radius of curvature of the mirror, d equal to the given distance of any object from the mirror, and d' equal to the distance of a moveable screen, which shall receive the true image of the object if the mirror be accurately formed, we shall have for

$$\text{this latter distance } d' = \frac{rd}{2d - r}.$$

The effect of an annular lens may be estimated at moderate distances to be nearly equal to that of 3000 Argand flames of about an inch diameter; that of a cylindric refractor at about 250; and that of a curved mirror may, perhaps, on an average, be assumed at about 10 Argand flames.

Power of the annular lenses, cylindric refractors, and curved mirrors.

A beautiful apparatus, which has received the name of *catadioptric* light, from the compound action by which it is characterized, was another of Fresnel's applications of dioptric instruments to the purposes of a lighthouse. This elegant apparatus consists of thirteen rings of glass of various diameters, arranged one above another, in an oval form. The five middle rings have an interior diameter of 11.81 inches (30^{cm.}), and form a cylindric lens, similar to that already described under the head "cylindric refractors." The other rings or prisms, five of which are upper and three lower, are ground and set in such a manner that they project all the light derived from the focus in a direction parallel to the other rays by *total reflection*. This effect is produced by arranging the prisms, so that the incident rays, after being refracted at the first surface, shall strike the second side of the prism at such an angle that, instead of passing through the prism at that point, they shall be *totally reflected* from it, and, after a second refraction, emerge from the third side in a direction parallel to those transmitted by the middle or simply refracting rings. When this apparatus is employed to light only a part of the horizon, the rings are discontinued on the side next to the land, and room is thus obtained for using a common fountain lamp; but when the whole horizon is to be illuminated, the apparatus must inclose the flame on every side, so that it has in this case been found necessary to employ the hydrostatic lamp of Thilorier, in which the balance is sulphate of zinc in solution. Fresnel was prevented, by an early death, the consequence of severe application to scientific pursuits, from ever constructing this beautiful instrument; and it was reserved for the present enlightened secretary of the *Commission des Phares* to complete his brother's invention.

The nature of this apparatus will be fully understood by a reference to fig. 16, which shows its section and plan. F is the focal point in which the flame is placed, r , r cylindrical refractors, forming by their union a cylinder with a lamp in its axis, and producing a zone of light of equal intensity all round the horizon, and r' , r' are cylindric refractors having their axes at right angles to those of the refractors r , r , and revolving round them. These exterior refractors in front of the inner refractors, which have been already described under the head of Cylindric Refractors, produce, by compound refraction, a beam similar to that resulting from an annular lens. x , x

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are catadioptric prismatic rings acting by *total reflection*, and giving out zones of light of equal intensity at every point of the horizon. The dotted lines show the course traversed by the rays of light which proceed from the lamp and are acted upon by the rings of glass. The catadioptric rings supply the places of the curved mirrors, which had at one time to be employed in the larger class of lights for a similar purpose, and as the reflection from the inner surface of a prism is, theoretically speaking, *total*, and the whole loss of light is merely that which is due to absorption in passing through the glass, and that which takes place at the two surfaces, there must of necessity be a much greater proportion of the incident light transmitted by the catadioptric action than can ever be obtained from the most perfect reflecting surface, the loss from reflection being held to be in no case less than one-half of the incident light.

The loss of light by reflection at the surface of the most perfect mirrors, and the perishable nature of the material composing their polish, induced Mr Alan Stevenson, so far back as 1835, in a report on the Light of Inchkeith, which had just been altered to the dioptric system, to propose the substitution of *totally reflecting* prisms, even in lights of the first order or largest dimensions. In this attempt he was much encouraged by the singular liberality of M. Léonor Fresnel, who not only freely communicated the method pursued by his distinguished brother Augustin Fresnel, in determining the forms of the zones of the small apparatus, introduced by him into the Harbour Lights of France, and his own mode of rigorously solving some of the preliminary questions involved in the computations; but also made various important suggestions, which substantially embrace the whole subject. The result was the preparation of a table containing Mr Stevenson's calculations of the forms of the zones of the first order, which are verifications of those of M. Fresnel; and the first catadioptric apparatus ever constructed, through the ardour and perseverance of M. François Soleil, on so magnificent a scale, was fitted up in the Skerryvore Lighthouse. In December 1843, a trial of the apparatus, attended with complete success, was made at the Royal Observatory of Paris, whereby it appeared that the illuminating effect of the cupola of zones was to that of the seven upper tiers of mirrors of the first order, as 140 to 87.

Mr Alan Stevenson having been directed by the Commissioners of the Northern Lighthouses to convert the fixed catoptric light of the Isle of May into a dioptric light of the first order, proposed that an attempt should be made to form a true cylindric, instead of a polygonal belt, for the refracting part of the apparatus; and this task was successfully completed by Messrs Cookson of Newcastle. The defect of the polygon lies in the excess of the radius of the circumscribing circle over that of the inscribed circle, which occasions an unequal distribution of light between its angles and the centre of each of its sides; and this fault

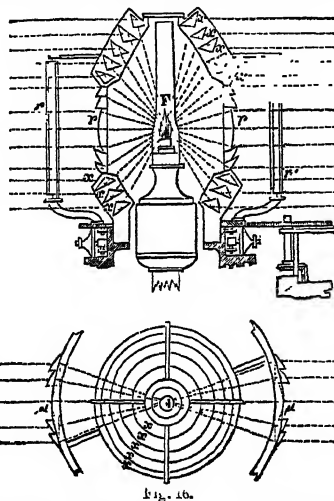
can only be fully remedied by constructing a cylindric belt, whose generating line is the middle mixtilinear section of an *annular* lens, revolving about a vertical axis passing through the principal focus. This is, in fact, the only form which can possibly produce an equal diffusion of the incident light over every part of the horizon.

In a report to the Commissioners of the Northern Lights there is the following description of the refractors constructed for the Isle of May light:—"I at first imagined," says Mr Alan Stevenson, "that the whole hoop of refractors might be built between two metallic rings, connecting them to each other solely by the means employed in cementing the pieces of the annular lenses; but a little consideration convinced me that this construction would make it necessary to build the zone at the lighthouse itself, and would thus greatly increase the risk of fracture. I was therefore reluctantly induced to divide the whole cylinder into ten arcs, each of which being set in a metallic frame, might be capable of being moved separately. The chance of any error in the figure of the instrument has thus a probability of being confined within narrower limits; whilst the rectification of any defective part becomes at the same time more easy. One other variation from the mode of construction at first contemplated has been forced upon me by the repeated failures which occurred in attempting to form the middle zone in one piece; and it was at length found necessary to divide this belt by a line passing through the horizontal plane of the focus. This division of the central zone, however, is attended with no appreciable loss of light, as the entire coincidence of the junction of the two pieces with the horizontal plane of the focus, confines the interception of the light to the fine joint at which they are cemented. With the exception of these trifling changes, the idea at first entertained of the construction of this instrument was fully realized, at the very first attempt, in the manufactory of Messrs Cookson." At a subsequent period the central zones were formed in one piece, and the arrangement of the apparatus greatly improved, by giving to the metallic frames which contain the prisms a rhomboidal¹ instead of a rectangular form. The junction of the frames being thus inclined from the perpendicular, do not in any azimuth intercept the light throughout the whole height of the refracting belt, but the interception is confined to a small rhomboidal space, whose area is inversely proportional to the sine of the angle of inclination; and when the helical joints are formed between the opposite angles of the rectangular frames, the amount of intercepted light becomes absolutely equal in every azimuth. Time and perseverance, and the patience and skill of M. François Soleil, who was urged to undertake the task, was at length crowned with success, and Mr Stevenson had the satisfaction of at last seeing a fixed light apparatus, of a truly cylindric form, with its central belt in one piece and the joints of each panel inclined to the horizon at such an angle as to render the light perfectly equal in every azimuth. Lanterns with diagonal framings are now also constructed in conformity with this arrangement of the zones.

The change of the light at the Isle of May, from the catoptric to the dioptric system, was generally acknowledged to be an improvement. A committee of the Royal Society of Edinburgh made some observations on the two lights which were exhibited in contrast on the night of the 26th of October 1836, from the town of Dunbar, which is distant about 13 miles from the lighthouse. Their report, which was drawn up by Professor Forbes, concludes in these words:—

"The following conclusions seem to be warranted:—

¹ "The form could not be exactly rhomboidal, but would be a portion of a helix intercepted between two planes, cutting the enveloped cylinder at right angles to its axis."



The cylindric form given to the refracting belts of the first order.

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"1. That at a distance of 13 miles, the mean effect of the new light is very much superior to the mean effect of the old light (perhaps in the ratio of two to one).

"2. That at *all* distances, the new light has a prodigious superiority to the old, from the equality of its effects in all azimuths.

"3. That the new light fulfils rigorously the conditions required for the distribution of light to the greatest advantage.

"4. That at distances much exceeding 13 miles, the new light must still be a very effective one, though to what extent the committee have not observed. The light is understood to be still a good one, when seen from Edinburgh at a distance of about 30 miles."

There are few finer specimens of art than an entire apparatus for a fixed light of the first order, as shown in fig. 17. It consists of a central belt of refractors, forming a hollow cylinder 6 feet in diameter, and 30 inches high; below it are six triangular rings of glass, ranged in a cylindrical form, and above a crown of thirteen rings of glass, forming by their union a hollow cage, composed of polished glass, 10 feet high and 6 feet in diameter! There is no work of art more beautiful or more creditable to the boldness, intelligence, and zeal of the artist.

Arrangement of apparatus in the light-house.

All the lights on the dioptric principle are illuminated by a flame placed in the centre of the apparatus or common focus of the principal lenses and cylindric refractors which are ranged round it. The burner of the lamp varies in its dimensions and its consumption of oil, according to the size of the instruments employed, which also determines what is called the *order* of the light, a name expressive of its *power* and *range*. Above and below the strictly dioptric part of the apparatus of each order there are also accessory parts, which, as just described, and shown in fig. 17, consist in fixed lights of catadioptric prisms arranged in tiers, one above another, like the leaves of a Venetian blind, and placed so as to reflect to the horizon the rays received from the lamp, which is in their common focus. In all revolving lights, up till 1850, the apparatus above the principal lenses either consisted of prisms similar to those described for fixed lights, or was diacatoptric, being composed of an union of eight lenses of 19.68 inches (50^{cm}) of focal distance, inclined inwards to the flame, which is in their common focus, and thus forming a frustum of an octagonal pyramid of 50° of inclination. These upper lenses were surmounted by plane mirrors, placed so as to reflect horizontally the beams transmitted by the lenses. In placing these upper lenses, it has been thought advisable to give their axes a horizontal inclination of 7° from that of the great lenses. By this arrangement, the flash of the upper lenses always precedes that of the principal lenses.

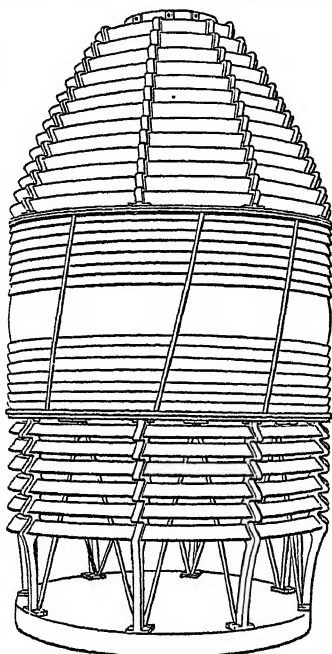


Fig. 17.

The use of the accessory apparatus is to collect the rays, which would otherwise pass above and below the main lenses, without contributing to the brilliancy of the light. These inclined mirrors and lenses have, since 1850, been entirely laid aside on the introduction of the Holophotal system of revolving lights, to be afterwards explained, in which totally reflecting prisms form part of the *revolving* apparatus, and supersede the inclined mirrors and lenses. The nature of the whole revolving apparatus of Fresnel will be more fully understood by referring to fig. 18, which is a section

Light-houses.

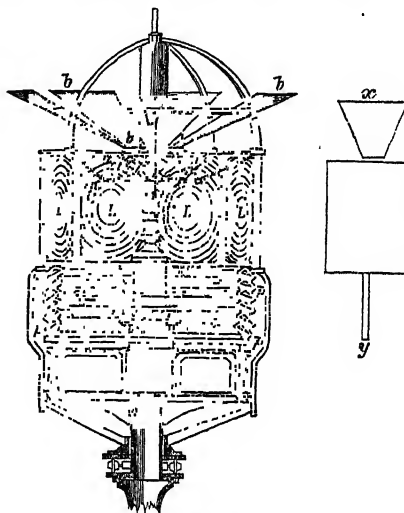


Fig. 18.

of a revolving dioptric apparatus of the first order; L, L, are the great annular lenses, forming by their union an octagonal prism, with the lamp in its axis, and projecting in horizontal beams the light which they receive from the focus; a, a, upper lenses, forming by their union a frustum of an octagonal pyramid of 50° of inclination, and having their foci coinciding in the focal point. They parallelize the rays of light which pass over the lenses. b, b, plane mirrors, placed above the pyramidal lenses, and so inclined as to project the beams reflected from them in planes parallel to the horizon.

The dioptric lights used in France are divided into four orders, in relation to their power and range; but in regard to their characteristic appearances, this division does not apply, as, in each of the orders, lights of identically the same character may be found, differing only in the distance at which they can be seen, and in the expense of their maintenance. The four orders may be briefly described as follows:—

Orders of the French lights.

1st. Lights of the first order, having an interior radius or focal distance of 36.22 inches (92^{cm}), and lighted by a lamp of four concentric wicks, consuming 570^l gallons of oil per annum.

2d. Lights of the second order, having an interior radius of 27.55 inches (70^{cm}), lighted by a lamp of three concentric wicks, consuming 384 gallons of oil per annum.

3d. Lights of the third order, lighted by a lamp of two concentric wicks, consuming 183 gallons of oil per annum. The instruments used in these lights are of two kinds, one having a focal distance of 19.68 inches (50^{cm}), and the other of 9.84 inches (25^{cm}).

4th. Lights of the fourth order, or harbour lights, having an internal radius of 5.9 inches (15^{cm}), and lighted by a lamp of one wick, or Argand burner, consuming 48 gallons of oil per annum.

The great loss of light by natural divergence in the parabolic reflector, and the separation of the rays into as many system.

¹ The experience of two at the Isle of May and Inchkeith, shows that the annual expenditure of spermaceti oil, in lights of the first order, does not exceed 570 gallons.

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portions as there are lenses in the frame, in Fresnel's revolving dioptric apparatus, together with the objectionable plan for intercepting the rays which pass above and below the lenses, led Mr Thomas Stevenson to inquire into the possibility of increasing the intensity of lights by changes in the optical arrangements. The parabolic reflectors act chiefly on the *posterior* portion of the flame, and generally receive about $\frac{1}{4}$ ths of the whole luminous sphere, while a series of dioptric instruments can affect only an *anterior* cone, amounting to about $\frac{1}{4}$ ths. Certain deductions, due to the form of the flame and the loss by reflection and refraction, reduce these numbers to $\frac{1}{8}$ d for the reflectors, and $\frac{1}{10}$ ths for the lenses, as the amount of light actually given forth by each system. Both arrangements are, therefore, so far unsuitable for revolving lights, in which the concentration of all the diverging rays into pencils of parallel rays is the grand object to be aimed at. The problem which Mr Stevenson assigned to himself was to *produce the brightest beam from a given flame by the smallest number of reflections and refractions*. This object he attained partly by combining dioptric with catoptric and catadioptric action, and partly by an *extension of the lenticular action itself over a greater subtense*. To this arrangement the name of *Holophotal* has been given, to signify the useful application of the *whole* of the light.

One mode of producing this effect is to combine an an-

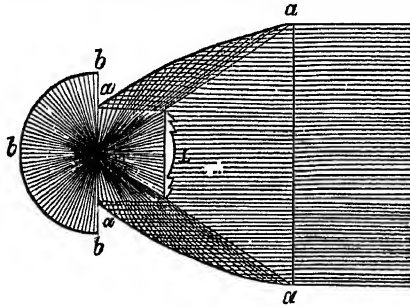


Fig. 19.

nular lens L, figs. 19 and 20; a parabolic conoid *a*, truncated at its parameter; and hemispherical mirror *b*. The lens, when at its proper focal distance from the flame, subtends the same angle from it as the outer lips of the paraboloid. The hemispherical reflector occupies the place of the parabolic conoid which has been cut off behind the parameter. The flame is at once in the centre of the hemispherical mirror and in the common

focus of the lens and paraboloid. Suppose the whole sphere of rays emanating from the flame to be divided into two portions, viz., the hemisphere of front rays and the hemisphere of back rays. Part of the anterior hemisphere of rays is intercepted by the lens and made parallel by its action, while the remainder is intercepted by the paraboloidal surface, and made parallel by its action. The rays forming the posterior hemisphere, and which fall upon the hemispherical reflector, are sent back through the focus in the samelines, but in directions opposite to those in which they came, whence passing onwards they are in part refracted by the lens, while the rest are made parallel by the paraboloid. The back rays thus finally emerge horizontally in union with the light from the anterior hemisphere. This instrument, therefore, fulfils the conditions prescribed, by collecting the *entire sphere of diverging rays into one parallel beam of light*.

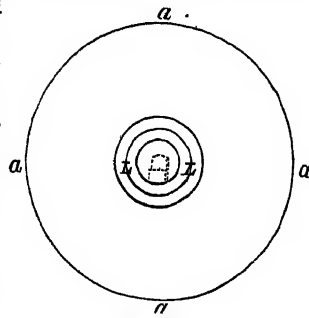


Fig. 20.

The first instrument constructed upon this principle was for the North Harbour of Peterhead, where it has been in use since August 1849. Mr A. Stevenson has also adopted an instrument of this kind, on a large scale, in Hoy Sound Lighthouse, one of the Northern Lights' stations.

Experiments were lately made at Gullan Hill to test the comparative power of an instrument on this principle (the reflecting part being of brass, and but roughly finished), and a highly-finished silver reflector of the usual construction; both instruments being 25 inches in diameter at the lips. The lights were viewed at distances of from 7 to 12 miles every night during a week, and in every instance the brass reflector on the holophotal principle had the advantage of the silver reflector; and on one occasion, when the atmosphere was thick, the light from the holophotal brass reflector was alone visible.

In so far as concerns the arrangement of the different parts, irrespective of the nature of the materials of which they are composed, the light emitted from any given flame by the instruments just described, should be the light of *maximum intensity*. But the most accurate experiments which have been undertaken by scientific observers have shown that reflection from the best silvered mirrors, and even from metallic specula made with the utmost care for experimental purposes, involves a loss of light by absorption of not less than about one-half of the whole incident rays.

The advantage of employing as largely as possible the principle of *total reflection* from glass, in place of ordinary reflection from metallic specula, induced Mr T. Stevenson to attempt further improvements in the holophotal system of illumination. If we retain the lens and the spherical mirror of the holophotal apparatus just described, and, in place of the paraboloid, conceive the arc between the lens and the spherical mirror to be filled up with glass rings, which are the solids of revolution generated by the rotation of the cross section of the totally reflecting prisms used in fixed lights, round a horizontal axis passing through the flame, we shall then have *extended the action of the lens, so as to parallelize one-half of the whole sphere of incident rays*. Such an arrangement is shown in figs. 21 and 22, where L

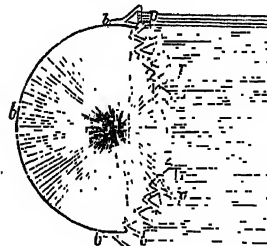


Fig. 21.

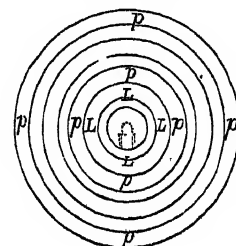


Fig. 22.

is the lens, *p* the totally reflecting prisms, and *b* is the spherical mirror. The distinguishing peculiarity of this arrangement is, that the prisms, instead of transmitting the light in parallel vertical plates, diverging all round as in the fixed light apparatus of Fresnel, produce an extension of the lenticular or *quaquaversal* action of the common annular lens, by assembling the light around its axis in the form of concentric hollow cylinders. In order to distinguish this system of prisms from those introduced by M. Fresnel, which have no lenticular action, they may therefore be termed *catadioptric lenses*.

The writer of this article has lately heard, that, although it had never been proposed to use such prisms for lighthouse purposes, a small lamp, for lighting the quays of a canal in Paris, was made by M. A. Fresnel, in 1824, in which some prisms, similar to those above described, formed an accessory part; but no drawing or description of such an apparatus was ever published, and all knowledge of it seems to have been

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lost till Mr T. Stevenson described his plan in 1849. Since that time, thirty-six instruments have been made at Edinburgh, on the small scale, both for home and foreign use. The first instance in which those prisms were ever applied to lighthouses was at the Horsburgh Light, near Singapore, the optical part of which was designed by Mr T. Stevenson. This was the first time that the principle of total reflection was applied to the moving apparatus of revolving lights. The first light of the large order, on this principle, was constructed under the direction of Mr Alan Stevenson, for North Ronaldsay, in the Orkneys; and seven others have recently been made in Paris for French and American light-houses. There can be no doubt that this arrangement will be generally adopted, instead of the combination of inclined lenses and plane mirrors, first employed at Corduan, and subsequently in other revolving lights in France and Britain.

Catadioptric glass mirror.

By an elegant adaptation of *totally reflecting zones*, Mr Thomas Stevenson has further succeeded in substituting, for a reflector of metal or silvered glass, a *polyzonal totally reflecting hemisphere of glass* (vide fig. 5). By this arrangement, reflection from metallic specula is abolished from every part of the system, and the principles of total reflection and simple refraction alone are employed.

The action of these glass zones will be best understood by referring to fig. 23, which gives the cross section of one

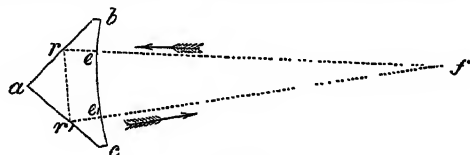


Fig. 23.

of them; f shows the flame or centre of the system, and the diverging rays are represented by dotted lines, the arrows indicating the direction of a ray before and after being altered by the prism. The side bc is concave, the centre of curvature being in f , the centre of the flame. The surfaces of the other sides, ab , and ac , are portions of parabolas, whose common focus is f , or of circles osculating the parabolic curves. Those parabolic surfaces face each other, and their tangents form an angle of 90° with each other at the vertex of the prism. Any ray proceeding from the centre f will be received as a normal to the surface bc , and will consequently pass on without suffering any deviation at e , where it meets the prism, to its incidence on the surface ab , where

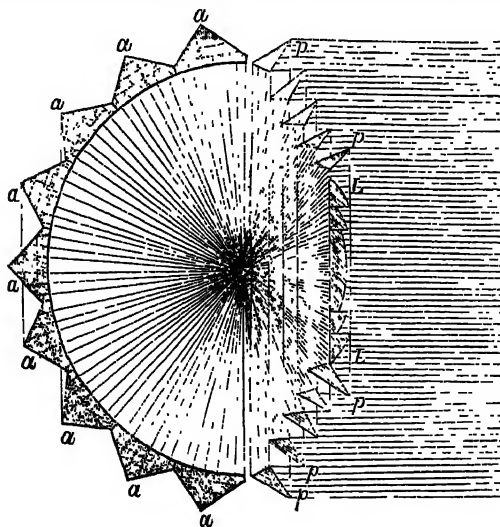


Fig. 24.

it will be totally reflected in the direction rr' , tangential to the sphere at the axis of each zone. At r' it again suffers

total reflection, and finally emerges in a radial direction without deviation at the point e' . An exactly similar action will take place simultaneously with another ray in the same path from the flame, though passing in an opposite direction. The concentric zones, a , which compose the dome (vide fig. 24), are solids of revolution, generated by the rotation round the horizontal axis of the instrument of triangles similar to a, b, c (fig. 23), with a radius equal to af . The angle formed by the radius with the horizontal axis of the instrument varies from nearly 90° down to zero, as shown in fig. 24. Where those angles vanish at a' , a conoid will result, having the radius of its base equal to the semichord of its inner surface. It will be seen that the prisms b, a, c , fig. 23, resemble in their action that of the drops of rain which give rise to the phenomenon of the *secondary* rainbow. In fig. 24, which shows the whole instrument complete, L represents the common lens acting on the rays by refraction only; p , the catadioptric portion of the lens acting by refraction and total reflection; and a, a', a , the prisms acting by total reflection only. Part of a hemispherical dome on this principle has now been successfully executed.

Fig. 25 shows the adaptation of the holophotal system to Fresnel's revolving light of the first order. L, L are the lenses, and p, p the catadioptric lenticular rings. The advantage of this system will clearly appear by comparing it with Fresnel's apparatus (fig. 18). At each of figs. 25 and 18, diagrams marked xy show proportionate sections of the beam of light given out by the two arrangements respectively. The objectionable arrangement of the lenses and mirrors a and b (fig. 18), in which so much of the light is lost, by the introduction of so many surfaces, and is also superseded.

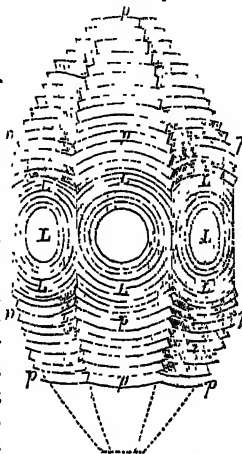


Fig. 25.

Adaptation of the Holophotal system to Fresnel's Apparatus.

For pointing out sunken reefs, on which no lighthouse Dipping can be placed, two plans have been proposed by Mr Thomas Stevenson. The first, or *dipping* light, consists in throwing a pencil of rays from a lantern on shore *down* upon the reef, by inclining the vertical axis of the apparatus at the requisite angle; and by this arrangement the visibility of the light is confined within certain limits, the passing within which is, to the seaman, a sign of danger, and a warning to *haul off* seaward. The second, or *apparent* light, applies to reefs on which a small beacon, capable of bearing a cage on its top, can be built, but which affords no room for a lighthouse tower. In this cage is placed some *reflecting* apparatus, either wholly *catadioptric*, or combining a *plane mirror* with a vertical system of straight lenticular prisms; and upon this there is projected, from a lantern on shore, a beam of light, which is diverted (according to the angle at which the cage apparatus on the beacon is set) into any given direction that may be required. This latter plan has been most successfully applied to the entrance of Stornoway Loch, a much-used harbour of refuge in the Lewis, and has drawn from many shipmasters frequenting that port written expressions of their satisfaction with the light, which is well seen *a mile and a half* in the offing: a distance amply sufficient for the limited purposes for which such lights should be used. The name *apparent* is given to this light, because, while it is really produced by a flame on shore, it *seems* to proceed from the beacon on the rock.

In all fixed lights of the present construction, which are

Light-houses.

Light-houses. not required to show all round the horizon, the light of the darkened part is either allowed to be lost, or is returned through the focus by means of a portion of a spherical mirror. There are, however, cases frequently occurring to the lighthouse engineer where it would be very desirable to employ this spare light, not in the direction diametrically opposite to the darkened arc, but in some other direction more suited to the configuration of the coast. The apparatus for Isle Oronsay, of which fig. 26 is a horizontal section through

Holophotal condensers for illuminating narrow sounds.

Light-houses.

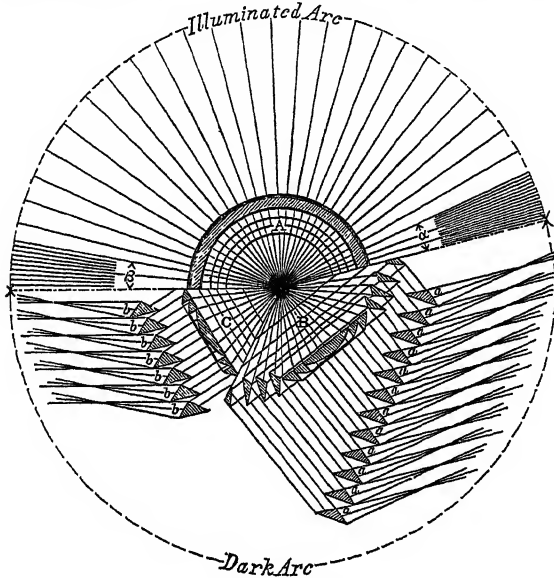


Fig. 26.

the focus, is the first which has been designed with a view to the most advantageous employment of this spare light.

The lighthouse of Isle Oronsay is situate in the narrow Sound of Skye, and, throughout nearly the whole of the illuminated arc, does not require to be seen to a greater distance than 3 or 4 miles, while in one direction (down the sound) it can be seen for 15 miles, and in another (up the sound) it can be seen for about 7 miles. If, therefore, a light were erected sufficiently powerful to be seen at the greatest distance required, it must be very greatly too powerful in every other direction, and consequently there would be a great waste of oil; while, if an apparatus only powerful enough for the short range were employed, it would become necessary to make use of subsidiary apparatus, implying additional lamps, and an increased expenditure of oil, to show up and down the sound. The apparatus shown was designed by Mr T. Stevenson, with the view of reinforcing the ordinary fixed-light apparatus in the directions of greatest range. This is effected by distributing in these directions the spare light on the dark side of the lantern, which, if returned through the focus in the ordinary manner by means of a spherical mirror, would only tend to strengthen that portion of the light which is already sufficiently powerful.

A is 167° of a small fixed-light apparatus subtending the entire arc to be illuminated; so that all the rest of the light, or 193° , is spare light. Of this, 129° are parallelized by the holophotal apparatus B; and the rays, falling on a series of equal and similar prisms, *a*, are again refracted, but in the horizontal plane only; and after passing through a focal point (independent for each prism), emerge in a series of twelve equal and parallel beams, having a divergence of about 10° , which are also equal and parallel to the diverging beam, *a*, and, consequently, according to well known optical laws, have the effect of strengthening it as much as if they were actually superimposed upon it. As the light of 139° is, in this manner, condensed into about 10° , the effect must be from 12 to 14 times that of the unassisted apparatus, and

should, therefore, be amply sufficient for a range of 15 miles. In like manner, the light parallelized by the other holophote C, are refracted by the prisms *b*, so as to strengthen the arc β , which will thus be rendered amply powerful for a range of 7 miles. The greater number of rays in the arcs α and β are intended to indicate the additional density due to the action of the subsidiary prisms. We shall only add, that when arcs of coloured light are to be employed, this method of strengthening any particular portion of the light becomes very important, as offering a ready method of equalizing the general range, otherwise interfered with by the enormous absorption of coloured media; and we might suggest, that, even where the light requires to be shown all round, it is possible to supplement any arc at the expense of any other, by cutting off an ordinary apparatus by a horizontal plane at any suitable height, and mounting a portion of a holophote and a series of prisms above it. By a somewhat similar arrangement to what has been described for Oronsay, the whole of the rays proceeding from a plane may be spread over any desired arc of the horizon.

Having thus fully described the catoptric and dioptric systems of illumination, it might be expected that we should institute a comparison between them. This, however, may now be considered unnecessary, as the universal adoption of the dioptric system speaks for itself. Its advantages are indeed too numerous and too palpable to be overlooked, combining, as they do, efficiency of action and fitness to meet every requirement, with economy in the consumption of oil; and we may safely say, that in all those countries where this important branch of administration is conducted with the care and solicitude which it deserves, the dioptric system has been adopted to the complete exclusion of the catoptric, except, indeed, in certain cases where economy of first construction and simplicity of detail are objects of primary importance.

General remarks.

To the Dutch belongs the honour of having first, *after the French*, embraced the system of Fresnel in their lights. The Commissioners of the Northern Lights followed in the train of improvement, and, in 1834, sent Mr Alan Stevenson on a mission to Paris, with full power to take such steps for acquiring a perfect knowledge of the dioptric system, and forming an opinion on its merits, as he should find necessary. The singular liberality with which he was received by M. Léonor Fresnel, brother of the late illustrious inventor of the system, and his successor as the Secretary of the Lighthouse Commission of France, afforded Mr A. Stevenson the means of making such a report on his return as induced the Commissioners to authorize him to remove the reflecting apparatus of the revolving light at Inchkeith, and substitute dioptric instruments in its place. This change was completed, and the light exhibited on the evening of 1st October 1835; and so great was the satisfaction which the change produced, that the Commissioners immediately instructed Mr Stevenson to make a similar change at the fixed light of the Isle of May, where the new light was exhibited on the 22d September 1836. The Trinity House of London followed next in adopting the improved system, and employed Mr A. Stevenson to superintend the construction of a revolving dioptric light of the first order, which was afterwards erected at the Start Point in Devonshire. Other countries followed, and the *Report of the Lighthouse Board of America*, published in 1852, which recommends (p. 13) the adoption of Fresnel's dioptric system, and the holophotal improvements, is a very full body of information on lighthouse subjects, extending over about 750 pages. Even Turkey has followed in the train of improvement, and we believe that a light on the dioptric principle will shortly be exhibited (if it be not already completed) from the Isle of Serpents. Fresnel, who is already classed with the greatest of those inventive minds which extend the boundaries of human knowledge, will thus, at the same

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time, receive a place amongst those benefactors of the species who have consecrated their genius to the common good of mankind; and, wherever maritime intercourse prevails, the solid advantages which his labours have procured will be felt and acknowledged.

When, however, this system was in its infancy, there were several objections raised to its adoption, which appeared to be of very considerable importance, though the experience of years has proved that they are not insurmountable. The first, and probably the most important, was the liability of the lamp to be extinguished from the failure of the leather work of the oil-pumps—a most serious objection, inasmuch as, from there being only one lamp, its failure implies the extinction of the light. The means adopted to remedy this have been already described (*vide* “mechanical lamp”), and an experience of twenty-one years in the Northern Lighthouses has proved them to be sufficient for the purpose; for during the whole of that time (although it has on several occasions been necessary to light the spare lamp) the light has only on one occasion been totally extinguished, a casualty which was caused by the keeper sleeping on his watch.

The only other objection worthy of mention is the short duration of the flash in revolving lights, owing to the small divergence ($5^{\circ} 9'$) of the annular lens. This has been corrected by setting the inclined mirrors, or holophotal prisms, a little in advance of the great lenses, so that they precede, and consequently prolong, the principal flash. M. Degrand has also proposed to cut the whole apparatus by a horizontal plane passing through the focus, and to set one portion a few degrees in advance of the other, a plan which has considerable advantages, as all the portions of the beam are more nearly of equal intensity.

Spherico-cylindric lenses.

Mr T. Stevenson, moreover, suggests an ingenious method of remedying this evil, by constructing lenses whose aberration in the vertical plane is corrected, while that in the horizontal plane may be adjusted to any determinate amount. In the application of this method of construction to the annular lenses they would be ground on the external surface as before; but the internal surface would be a portion of a vertical cylinder of suitable radius. Thus each vertical section would be similar to that of a plano-convex lens as at present, and would refract the rays accordingly, while the horizontal sections would be of a meniscal form, and would act only by the excess of their convexity over their concavity. Thus, by varying the radius of the cylinder, any amount of horizontal divergence may be obtained, and this without much increasing the thickness of the glass, at least in the case of revolving lights, in which a curve of long radius might be applied.

Fuel of light-houses.

The oil, until lately, most generally employed in the lighthouses of the United Kingdom was the sperm oil of commerce, which is obtained from the South Sea whale (*Physeter macrocephalus*). In France, the colza oil, which is expressed from the seed of a species of wild cabbage (*Brassica oleracea colza*), and the olive oil, are chiefly used; and a species of the former has now been successfully introduced into the British lighthouses.

The advantages of the colza oil are thus stated by the engineer of the Scottish Lighthouse Board:—

“It appears from pretty careful photometrical measurements of various kinds, that the light derived from the colza oil is, in point of intensity, a little superior to that derived from the spermaceti oil, being in the ratio of 1.056 to 1. The colza oil burns both in the Fresnel lamp and the single Argand burner with a thick wick during seventeen hours, without requiring any coaling of the wick or any adjustment of the damper; and the flame seems to be more steady and freer from flickering than that derived from spermaceti oil. There seems (most probably owing to the greater steadiness of the flame) to be less breakage

of glass chimneys with the colza than with the spermaceti oil.

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The consumption of oil seems in the Fresnel lamp to be 121 for colza, and 114 for spermaceti; while in the common Argand, the consumption appears to be 910 for colza, and 902 for spermaceti; and if we assume the means of these numbers, 515 for colza, and 508 for spermaceti, as representing the relative expenditure of these oils; and if the price of colza be 3s. 9d., while that of spermaceti is 6s. 9d. per imperial gallon; we shall have a saving in the ratio of 1 to 1.755, which, at the present rate of supply for the Northern Lights, would give a saving of about L.3266 per annum.”

In a few lighthouses which are near towns, the gas of Gas-pit coal has been used; and there are certain advantages, more especially in dioptric lights, where there is only one large central flame, which would render the use of gas desirable. The form of the flame, which is an object of considerable importance, would thus be rendered less variable, and could be more easily regulated, and the inconvenience of the clock-work of the lamp would be wholly avoided. But it is obvious that gas is by no means suitable for the majority of lighthouses, their distant situation, and generally difficult access, rendering the transport of large quantities of coal expensive and uncertain; whilst in many of them there is no means of erecting the apparatus necessary for manufacturing gas. There are other considerations which must induce us to pause before adopting gas as the fuel of lighthouses; for, however much the risk of accident may be diminished in the present day, it still forms a question, which ought not to be hastily decided, how far we should be justified in running even the most remote risk of explosion in establishments such as lighthouses, the sudden failure of which might involve consequences of the most fatal description, and the situation of which is often such, that their re-establishment must be a work of great expense and time.

The application of the Drummond and Voltaic lights to lighthouse purposes is, owing to their prodigious intensity, a very desirable consummation; but it is surrounded by so many practical difficulties, that it may, in the present state of our knowledge, be pronounced unattainable. The uncertainty which attends the exhibition of both these lights is of itself a sufficient reason for coming to this conclusion. But other reasons unhappily are not wanting. The smallness of the flame renders those lights wholly inapplicable to dioptric instruments, which require a great body of flame, in order to produce a degree of divergence sufficient to render the duration of the flash in revolving lights long enough to answer the purpose of the mariner. M. Fresnel made some experiments on the application of the Drummond light to dioptric instruments, which completely demonstrate their unsuitability for this combination. He found that the light obtained by placing it in the focus of a great annular lens was much more intense than that produced by the great lamp and lens of Corduan; but the divergence did not exceed $30'$; so that, in a revolution like that of Corduan, the flashes would last only $1\frac{1}{2}$ second, and would not, therefore, be seen in such a manner as to suit the practical purposes of a revolving light. The great cylindrical refractor, used in fixed lights of the first order, was also tried with the Drummond light in its focus; but it gave coloured spectra at the top and bottom, and only a small bar of white light was transmitted from the centre of the instrument. The same deficiency of divergence completely unfits the combination of the Drummond light with the reflector for the purposes of a fixed light, and even if this cause did not operate against its application in revolving lights on the catoptric plan, the supply of the gases, which is attended with almost insurmountable difficulties, would, in any case, render the maintenance of the light precarious and uncertain in the last degree.

There are many questions of much interest regarding

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General
questions
regarding
lighthouses

Distinction
and distri-
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lighthouses, which appear to open an extensive field of inquiry; and it may be doubted whether some of them have received that degree of consideration to which their importance entitles them. Amongst these we may rank the numerous questions which may be raised regarding the most effective kind of distinctions for lights. Those distinctions may be naturally expected to be the most effective which strike an observer by their *appearance* alone. Thus a red and white light, a revolving and a fixed light, offer *appearances* which are calculated to produce upon the observer a stronger sense of their difference than the same observer would receive from lights the sole difference of which lies in their revolutions being performed in greater or less intervals of time. On the other hand, the distinctions derived from time, if the intervals on which they depend do not approach too closely to each other, appear to afford very suitable means for characterizing lights; and the number of distinctions which may be founded upon time alone are pretty numerous. Coloured media have the great disadvantage of absorbing light, and the only colour which has hitherto been found useful in practice is red, all others, at even moderate distances, serving merely to enfeeble, without characterizing, lights. In the system of Fresnel, as already explained, all the distinctions are based upon time alone. Mr Robert Stevenson, the engineer of the Northern Lighthouses, has invented two distinctions, which, although they are produced by variations of the time, possess characteristic *appearances*, sufficiently marked to enable an observer to distinguish a light without counting time. The one is called a *flashing* light, in which the flashes and eclipses succeed each other so rapidly as to give the appearance of a succession of brilliant scintillations; and the other has been called *intermittent*, from its consisting of a fixed light, which is suddenly and totally eclipsed, and again as suddenly revealed to view. The effect of this light is entirely different from that of any revolving light, both from the great inequality of the intervals of light and darkness, and also from the contrast which is produced by its sudden disappearance and reappearance, which is completely different from the gradual diminution and increase of the light in revolving lights, more especially in those on the catoptric principle. The great and still increasing number of lights renders the means of distinguishing them one of the most important considerations connected with lighthouses.

Arrange-
ment of
lights on
the coast.

Not less important, and very nearly allied to the subject of distinction, is that of the arrangement of lights on a line of coast. The choice of the most suitable places, and the assigning to each the characteristic appearances which are most likely to distinguish it from all the neighbouring lights, are points requiring much consideration; and it ought never to be forgotten, that the indiscriminate erection of lighthouses soon leads to confusion, and that the needless exhibition of a light, by involving the loss of a distinction, may afterwards prove inconvenient in the case of some future light, which time and the growing wants of trade may call for on the same line of coast. To enter at length upon this topic, or even to lay down the general principles which ought to regulate the distribution of lights, would exceed the limits of this article; but in connection with this it may be observed, that the superintendence of lighthouses should be committed to one general body, and ought not to be left to local trusts, whose operations are too often conducted on narrow principles, without reference to general interests. The inconveniences arising from interference between the distinctions of the lights under one trust, and those of the lights under another, are thereby avoided; and the full advantage is obtained of the means of distinction at the disposal of both.

The considerations which enter into the choice of the position and character of the lights on a line of coast are either, on the one hand, so simple and self-evident as

scarcely to admit of being stated in a general form, without becoming mere truisms; or are, on the other hand, so very numerous, and often so complicated, as scarcely to be susceptible of compression into any general laws. We shall not, therefore, do more than very briefly notice, in the form of distinct propositions, a few of the chief considerations which should guide us in the selection of the sites and characteristic appearance of the lighthouses to be placed on a line of coast.

1. The most prominent points of a line of coast, or those first made on *over-sea* voyages, should be first lighted; and the most powerful lights should be adapted to them, so that they may be discovered by the mariner as long as possible before his reaching land. 2. So far as is consistent with a due attention to distinction, revolving lights of some description, which are necessarily more powerful than fixed lights, should be employed at the outposts on a line of coast. 3. Lights of precisely identical character and appearance should not, if possible, occur within a less distance than 100 miles of each other on the same line of coast, which is made by over-sea vessels. 4. In all cases, the distinction of colour should never be adopted except from absolute necessity. 5. Fixed lights, and others of less power, may be more readily adopted in narrow seas, because the *range* of the lights in such situations is generally less than that of open sea-lights. 6. In narrow seas, also, the distance between lights of the same appearance may often be safely reduced within much lower limits than is desirable for the greater sea-lights. Thus there are many instances in which the distance separating lights of the same character need not exceed 50 miles; and peculiar cases occur in which even a much less separation between similar lights may be sufficient. 7. Lights intended to guard vessels from reefs, shoals, or other dangers, should, in every case where it is practicable, be placed *seaward* of the danger itself, as it is desirable that seamen be enabled to *make* the lights with confidence. 8. Views of economy in the first cost of a lighthouse should never be permitted to interfere with placing it in the best possible position; and, when funds are deficient, it will generally be found that the wise course is to delay the work until a sum shall have been obtained sufficient for the erection of the lighthouse on the best site. 9. The elevation of the lantern above the sea should not, if possible, for sea-lights, exceed 200 feet; and about 150 feet is sufficient, under almost any circumstances, to give the range which is required. Lights placed on high headlands are subject to be frequently wrapped in fog, and are often thereby rendered useless at times when lights on a lower level might be perfectly efficient. But this rule must not, and indeed cannot, be strictly followed, especially on the British coast, where there are so many projecting cliffs, which, while they subject the lights placed on them to occasional obscuration by fog, would also entirely and permanently hide from view lights placed on the lower land adjoining them. In such cases, all that can be done is carefully to weigh all the circumstances of the locality, and choose that site for the lighthouse which seems to afford the greatest balance of advantage to navigation. As might be expected, in questions of this kind, the opinions of the most experienced persons are often very conflicting, according to the value which is set on the various elements which enter into the inquiry. 10. The best position for a sea-light ought rarely to be neglected for the sake of the more immediate benefit of some neighbouring port, however important or influential; and the interests of navigation, as well as the true welfare of the port itself, will generally be much better served by placing the sea-light *where it ought to be*, and adding, on a smaller scale, such subsidiary lights as the channel leading to the entrance of the port may require. 11. It may be held as a general maxim, that the fewer lights that can be employed in the illumination of a coast the

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Lightfoot. better, not only on the score of economy, but also of real efficiency. Every light needlessly erected may, in certain circumstances, become a source of confusion to the mariner; and, in the event of another light being required in the neighbourhood, it becomes a *deduction* from the means of distinguishing it from the lights which existed previous to its establishment. By the needless erection of a new lighthouse, therefore, we not only expend public treasure, but waste the means of distinction among the neighbouring lights. 12. Distinctions of lights, founded upon the minute estimation of intervals of time between flashes, and especially on the measurement of the duration of light and dark periods, are less satisfactory to the great majority of coasting seamen, and are more liable to derangement by atmospheric changes, than those distinctions which are founded on what may more properly be called the *characteristic appearance* of the lights, in which the times for the recurrence of certain appearances differ so widely from each other as not to require for their detection any very minute observation in a stormy night. Thus, for example, flashing lights of five seconds' interval, and revolving lights of half a minute, one minute, and two minutes, are much more characteristic than those which are distinguished from each other by intervals varying according to a slower series of 5", 10", 20", 40", &c. 13. Harbour and local lights, which have a circumscribed range, should generally be fixed instead of revolving; and may often, for the same reason, be safely distinguished by coloured media. In many cases, also, where they are to serve as guides into a narrow channel, the leading lights which are used should, at the same time, be so arranged as to serve for a distinction from any neighbouring lights. 14. Floating lights, which are very expensive, and more or less uncertain, from their liability to drift from their moorings, as well as defective in power, should never be employed to indicate a turning-point in a navigation in any situation where the conjunction of lights on the shore can be applied at a reasonable expense.

British and Irish Lights.

In concluding, it may be necessary to state that the English lights are placed under the Corporation of Trinity House of Deptford, Stroud; the Scottish lights are under the management of the Commissioners of Northern Lights; and the Irish lights are under the care of the Corporation for preserving and improving the port of Dublin, commonly called the Ballast Board.

Last act of parliament, 16th and 17th Vict., cap. 131. The last act of parliament on the subject of lighthouses forms part of one the general title of which is, "An act to amend various laws relating to merchant shipping." It passed 20th August 1853. The chief provisions which affect lighthouses are the following:—1. The light dues of the United

Kingdom are to form one *imperial* fund, under the control of the Board of Trade. 2. From this fund all expenses of erecting and maintaining the lights of the United Kingdom are to be defrayed. 3. The three boards which manage the lighthouses in England, Scotland, and Ireland are to render account of their expenditure to the Board of Trade. 4. The Trinity House, or English board, is to exercise a certain control over the boards in Scotland and Ireland, and is to judge of all their proposals to erect new lights, or to change existing ones; but in every case the sanction of the Board of Trade must precede the acts of each of the three boards.

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The following works may be consulted on the subject of lighthouses:—Smeaton's *Narrative of the Eddystone Lighthouse*, Lond. 1793; Stevenson's *Account of the Bell-Rock Lighthouse*, Edinburgh, 1824; Belidor, *Architecture Hydraulique*, vol. iv., p. 151; Peclet, *Traité de l'éclairage des Phares*, Paris, 1827; Fresnel's *Memoire sur un Nouveau Système d'éclairage des Phares*, Paris, 1822; Admiral de Rosset's *Rapport, contenant l'Exposition du Système adopté par la Commission des Phares pour éclairer les Côtes de France*, Paris, 1825; *Treatise on Burning Instruments*, containing the method of building large polyzonal lenses, by D. Brewster, LL.D., F.R.S., Edin. 1812; *Fanale di Salvo, nell' Istria, Illuminato a Gaz*, Vienna, 1821; *On Construction of Polyzonal Lenses and Mirrors of Great Magnitude, for Lighthouses, &c.*, by D. Brewster, LL.D., F.R.S. (*Edin. Phil. Jour.*, 1823, vol. viii., p. 160); *Account of a New System of Illumination for Lighthouses*, by D. Brewster, LL.D., F.R.S., Edin. 1827; *Saggio di Osservazione, &c.*, or *Observations on the Means of Improving the Construction of Lighthouses*; with an Appendix, on the Application of Gas to Lighthouses, by the Chevalier G. Aldini, Milan, 1823; Bordier Marcet's *Notice descriptif d'un Fanal à double aspect, &c.*, Paris, 1823; Bordier Marcet's *Parabole Soumise à l'art, ou Essai sur la Catoptrique de l'éclairage*, Paris, 1819; L. Fresnel's *Description Sommaire des Phares et Fanaux allumés sur les Côtes de France, au 1^{er} d'Août, 1837*; *The Lighthouses of the British Islands, from the Hydrographical Office of the Admiralty*, Lond. 1836; *Instructions pour le service des Phares Lenticulaires*, par L. Fresnel, Paris, 1836; Stevenson's *Sketch of Civil Engineering in America*, London, 1838, p. 296; *Report of Select Committee of the House of Commons on Lighthouses*, 1834; *Report by a Committee of the Board to the Commissioners of the Northern Lighthouses, on the "Report of the Select Committee," 1836*; *Report to the Commissioners of the Northern Lighthouses on the Illumination of Lighthouses*, by Alan Stevenson, M.A., Edin., 1834; *Report to the same Board, on the Inchkeith Dioptric Light*, by Alan Stevenson, Edin., 1835; *Report on the Isle of May Dioptric Light*, by Alan Stevenson, 1836; *Report on the Isle of May Light*, by a Committee of the Royal Society (Professor Forbes, reporter), Edin. 1836; *Account of Skerryvore Lighthouse, with Notes on Lighthouse Illumination*, by Alan Stevenson, LL.B., Edin., A. & C. Black, 1847; Stevenson's *Treatise on the History, Construction, and Illumination of Lighthouses*, London, 1850; *Account of the Holographical System of Illuminating Lighthouses*, by Thomas Stevenson, F.R.S.E., C.E., in the *Transactions of the Royal Scottish Society of Arts* for 1849; *Formulas for Constructing Totally Reflecting Hemispherical Mirrors*, by William Swan, F.R.S.E., *Trans. Roy. Scott. Soc. of Arts*, 1850; *Description of Spherico-Cylindric Lenses, &c.*, by T. Stevenson, F.R.S.E., *Edinburgh New Philosophical Journal*, 1855; *Report of the Lighthouse Board of America*, Washington, 1852. (A. S.—N.)

LIGHTFOOT, JOHN, a learned commentator, was the son of a clergyman, and was born at the rectory of Stoke-upon-Trent, in March 1602. After receiving his elementary education at Moreton Green, near Congleton, he entered, in 1617, Christ's College, Cambridge, where he applied himself to the study of the learned languages, and was reputed the best orator among the under-graduates. At the age of nineteen he became Bachelor of Arts; and leaving the university, acted as usher for two years in a school at Repton, in Derbyshire. He then took orders, and was appointed curate of Norton-under-Hales, in Shropshire. While chaplain in the family of Sir Rowland Cotton, he became imbued with an enthusiasm for the study of Hebrew; and shortly afterwards, resigning his cure, he removed to London, in order to devote his time wholly to study. Here, after a short stay, he formed the design of

travelling abroad, but was prevailed on to become pastor of Stone, in his native county. This charge he quitted in 1628, a short time after his marriage, and removed to Hernsey, near London, for the purpose of consulting Sion College Library in the course of his studies. In 1629 appeared his first work, *Erubhim, or Miscellanies, Christian and Judaical*. Sir Rowland Cotton, to whom it was dedicated, presented him, in 1630, to the rectory of Ashley, in Staffordshire.

Lightfoot now devoted himself ardently and exclusively to the study of the Scriptures; and in order to superintend the publication of his researches, he, in 1642, again repaired to London, where he was appointed minister of St Bartholomew's, behind the Exchange. On account of his great biblical learning, he was nominated a member of the Assembly of Divines, and in their councils he was a bold and

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hearty friend of the Presbyterian party. He preached before the House of Commons in March 1643, and was soon after nominated by the parliamentary visitors Master of Catherine Hall, Cambridge. At the close of the year he was presented to the rectory of Great Munden, in Hertfordshire. In 1644 appeared the first part of his *Harmony*, accompanied by an outline of the entire work, which was slowly filled in during the later years of his life. Having taken the degree of Doctor in Divinity in 1652, he was elected Vice-Chancellor of the University of Cambridge in 1655, and was about the same time engaged in revising the Polyglott Bible as it went to the press. At the Restoration his mastership of Catherine Hall, which he had offered to resign, was confirmed to him, along with his living of Great Munden. A prebend in the church of Ely was also bestowed upon him by Lord-Keeper Bridgman. In 1661 he was appointed one of the assistants at the conference upon the Liturgy; but, disliking the heat of controversy, he soon ceased to attend, and retired to Munden, where a cordial affection subsisted between him and his rustic flock. Favoured by a healthy constitution and by abstemious habits he continued till his death, December 6, 1675, to labour at his *Harmony*.

Dr Lightfoot's fame rests upon his intimacy with Rabbinical learning, and in this no English commentator has ever surpassed him. A collection of his works was first printed in 2 vols. folio in 1684, and supplemented by an 8vo volume of *Remains* in 1700. The best edition is edited, with a life of the author, by the Rev. J. R. Pitman, A.M., 13 vols., London, 1825.

LIGOR, a seaport-town and capital of a cognominal state in Lower Siam, Malayan Peninsula, situate at the mouth of the Ligor River, which here enters the Gulf of Siam opposite the island of Tantalén, N. Lat. 8. 25., E. Long. 100. 10. It is encompassed by a wall and ditch, and contains many brick temples and pyramids. Cotton, canes, pepper, and tin are exported hence to China. Pop. about 5000.

LIGURIA, in *Ancient Geography*, a region of Northern Italy, stretching along the N. coast of the Tyrrhenian Sea. Considered in its primitive meaning as "the country of the Ligurians," it is mentioned by the early Greek authors as extending as far westward as the mouths of the Rhone; while, according to Polybius, its eastern boundary was Pisæ, and its northern the country of the Arretines. Strabo, however, and other ancient geographers, considered it as bounded on the N. by the Padus, on the W. by the Varus, and on the E. by the Trebia; and these same limits were fixed by Augustus, when he constituted Liguria the ninth region of Italy. The Ligurians were among the first settlers in Italy. Of their origin nothing certain is known, except that they were generally held by ancient writers to be distinct from the Celtic race, an opinion, however, which some moderns have opposed. The principal tribes on the S. side of the Apennines were the *Apuani*, the most formidable to the Romans; the *Brinates*; the *Genuates*, dwelling around Genua; the *Veturii*; the *Ingauni*, occupying the environs of *Albium Ingaunum*; the *Intemelii*; and the *Vediantii*. On the N. of the Apennines were the *Epanterii*; the *Eburates*; the *Taurini*, dwelling around their capital, *Augusta Taurinorum*; the *Statielli*, near *Aquæ Statiellæ*; and the *Vagienni*, in the neighbourhood of *Augusta Vagiennorum*. The distinctive positions of all these, as well as of the other inferior tribes mentioned by Pliny and Livy, have never been accurately defined. The following are the sea-coast towns enumerated by Pliny and Ptolemy:—*Nicæa* (Nice), *Cemenelum* (Cuniez), *Portus Herculis Monæci* (Monaco), *Albium Intemelium* (Vintimiglia), *Albium Ingaunum* (Albenga), *Vada Sabbata* (Vado), *Genua*, *Portus Delphini* (Porto Fino), *Tigullia* (Tregoso), *Segesta* (Sestri), *Portus Veneris*

(Porto Venere), and *Portus Lunæ*. The principal towns on the N. side of the Apennines, which latterly rose to great importance, and are styled by Pliny "nobilis oppida," were,—*Dertona* (Tortona), *Iria* (Voghera), *Asta* (Asti), *Pollentia* (Polenza), *Valentinum* (Valenza), *Augusta Vagiennorum* (Bene), *Alba Pompeia* (Alba), *Aquæ Statiellæ* (Acqui), *Augusta Taurinorum* (Turin), *Barderate*, *Industria*, *Carrea Potentia*, *Clastidium* (Casteggio), *Ceba* (Ceva), and *Libarra*. The Ligurians, so often praised by ancient authors for their hardihood and bravery, are generally understood to be those on the S. side of the Apennines exclusively. In the time of Strabo, these eked out the scanty produce of their stony and sterile soil by hunting and feeding flocks, and thus fostered that vigour of frame and ferocity of disposition which long rendered them the indomitable foes and plunderers of the Romans. They were renowned as slingers and light infantry in the armies of the Carthaginians, and afterwards in those of the Romans. The most remarkable natural product was a mineral resembling amber, called *λγγούριον*. Their chief export was timber, and their principal emporium Genua. For the physical geography of Liguria, see ITALY.

LIMFIORD, an extensive inlet of the North Sea, in the N. part of the Jutland of Denmark, between N. Lat. 56. 28. and 57. 8., and E. Long. 8. 12. and 10. 21. Area, about 250 square miles. It communicates with the Cattegat by its main entrance on the E., and with the ocean by a narrow passage on the W., opened in 1825 by the violence of the sea. In length from sea to sea it is 105 miles, and about 40 miles in maximum breadth. Its course is tortuous and broken by numerous islands, the largest of which is Mors, 15 miles long by 5 miles in breadth. The waters are very shallow, and the channels intricate; flat-bottomed boats, however, can navigate it with ease. The only entrance for vessels of any size is by the Cattegat inlet.

LILBURNE, JOHN, a famous demagogue, was born of an ancient family in the county of Durham in 1618. After receiving a scanty education, he was apprenticed to a clothier in London; and while in this humble station, his sympathy with the Puritanic party was so strong and intrepid that he became a confidant in all their enterprises. Repairing, at his own instance to Holland, he there printed Bastwick's *Merry Litany*, and during a sojourn of several months, and after his return to London, continued to publish vehement attacks upon the bishops and prerogative, which eventually, in 1637, brought him under the lash of the Star Chamber. After unflinchingly enduring 500 scourges and exposure on the pillory, he was thrown into the Fleet, and lay under a double load of irons until the meeting of the Long Parliament in 1640. During the civil war he fought valiantly, and was promoted by the Earl of Manchester to the rank of lieutenant-colonel; but offended at the rising prevalence of Presbyterianism, he exchanged the sword for the pen in 1645, and, amid repeated prosecutions and imprisonments, directed a ceaseless onset of pamphlets against the dominant party, which led to his banishment in 1650. In 1653, returning to England without a warrant, he underwent a trial; but upon giving security for good behaviour in the future, he was allowed to remain in the kingdom. He then became a preacher among the Quakers at Eltham in Kent, and died there in 1657.

LILLE, or LISLE, a strongly fortified and important manufacturing town of France, capital of the department of Nord, is situated on the Denle, a canal connecting the Scarpe and the Lys, 51 miles S.E. from Dunkerque, and 171 N. of Paris, by railway; N. Lat. 50. 38. 44., and E. Long. 3. 3. 59. It stands in a flat and fertile district, and is surrounded by very strong fortifications and wet ditches. It is entered by seven gates, has wide and regular streets, and is generally well built. One of the most conspicuous

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Lille.

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Lillo.

objects in the town is a citadel in the form of a pentagon, attached to which there are barracks and magazines. This fortification is one of the finest specimens of the skill of Vauban, and is considered impregnable, both from being furnished with every description of military appliances, and because the canal can be used to isolate its position. The town-hall is a curious mass of buildings, in the Gothic style, built in 1430, and was anciently occupied by the dukes of Burgundy. It contains an interesting and valuable collection of drawings by the old masters, among which are 86 by Raphael, and 197 by Michael Angelo. The church of St Catherine, interesting for the beauty and simplicity of its architecture, is adorned with a painting by Rubens, considered by some the finest effort of his genius. The Hôpital Comtesse, founded in the thirteenth century, although somewhat injured by fire in 1467, is still in a good state of preservation. There are several buildings for scientific and literary purposes, an exchange, prisons, and a number of philanthropic institutions. Lille is very deficient in its supply of good water, and the greater part is taken from the canal.

The manufactures of Lille are very important, the principal being cotton yarn, cotton cloths of various kinds, woollen fabrics, paper, leather, soap, and oils. There are about 300 windmills in the neighbourhood, which are used in producing the oil. There are also sugar refineries, iron and copper foundries, and bleaching establishments. The trade in hops, chicory, hides, wool, &c., is extensive. The working classes, in consequence of low wages and dissipation, are always poor, and their dwellings are for the most part wretched ill-ventilated hovels.

Lille was founded in 1009, by Bandouin IV., Count of Flanders. It fell into the power of Philip the Fair, after a siege of three months, in 1297, and was taken again by Guy, Count of Flanders, in 1302. The Protestants attempted in vain to surprise it in 1581; and the French besieged it, without success, in 1645. Wrested from the Spaniards by Louis XIV., in 1667, and retaken by the allies in 1708, after a long and obstinate siege, it was ceded to France by the treaty of Utrecht. The Austrians bombarded it from the 29th September till the 6th October 1792, but the garrison, admirably supported by the bravery of the inhabitants, compelled them to raise the siege. On each side there was a loss of about 2000 men killed and wounded. Pop. (1851) 68,463.

LILLEBONNE (ancient *Juliobona*), a manufacturing town of France, department of Seine-Inferieure, situate at the foot of a wooded eminence on the Bolbec, an affluent of the Seine, 19 miles E. of Havre. Its appearance is dull and uninteresting, and most of the houses are constructed of wood. There are numerous cotton mills, and several tanneries in and around the town, and a brisk trade is carried on in leather, groceries, hardware, and cattle. In ancient times this was the chief town of the Caleti; and, as the remains testify, must have been one of the chief cities in Gallia Belgica. Traces of a Latin theatre exist close to the town. Near these remains is an old castle, once the residence of William the Conqueror, and where, it is said, he divulged to the assembled barons his scheme for the invasion of England. The only other building of mark is the parish church, surmounted by an elegant Gothic spire. Pop. 4300.

LILLO, GEORGE, a dramatist, was born in 1693, near Moorgate, in London, where he subsequently conducted a successful business as a jeweller. His first play, *Silvia*, produced in 1731, and written after the model of the *Beggar's Opera*, met with little success. Yet in the following year his tragedy of *George Barnwell* was acted at Drury Lane to crowded houses for twenty successive nights, and gained the notice of Queen Caroline, who requested to peruse the manuscript. His best tragedy, *Fatal Curiosity*,

produced at Haymarket Theatre in 1736, was attended with little success on its first appearance, but in the following year, through the friendly exertions of Henry Fielding, who was then manager, it was received with a fair amount of applause. About the same time was written his *Arden of Feversham*, modernized from an old tragedy of the same name. He died in 1739, shortly after finishing his tragedy of *Elmerick*. Leaving the high-bred sorrows and fancy-striking scenes of romantic tragedy, Lillo endeavoured to rivet the sympathies by the bare depicting of the woes and fatal passions of domestic life. His temporary success may be referred to the novelty of the plan, and (in his *Fatal Curiosity* especially) to the truthful description of the workings of human passion, and to the consummate art in the construction of the plot. The neglect into which this drama just named has fallen is a conclusive proof that the proper sphere of tragedy is amid scenes that afford at once a theme for poetry and a tale of pity,—that exalt the imagination while they affect the heart. His *Dramatic Works* were published, with an account of his life, by Thomas Davies, in 2 vols. 8vo, in 1775, and reprinted in 1811.

LILLY, JOHN, a dramatic poet, considered by some a reformer of the English language, was born in Kent about 1558. At sixteen he entered Magdalen College, Oxford, became Bachelor of Arts in 1573, and Master of Arts in 1575. After staying for some time at Cambridge, he repaired to London; and in 1579 was a dependant upon courtiers, and patronized by Queen Elizabeth. In 1580 was published his first work, *Euphues*, a romance, which, partly from its satire, and partly from its apophthegms and antitheses, gave popularity to an affected style of phraseology, called *Euphuism*. Lilly also published nine plays, six of which had been played before the Queen, and were afterwards published together in 1632. About 1589 appeared his pamphlet against Martin Marprelate, entitled *Pappe with a Hatchet*, which has sometimes been attributed to Nashe. The date of Lilly's death is unknown, but according to Anthony Wood, he was living in 1597, when his last comedy was published.

LILLY, William, the astrologer, was born at Diseworth, a village in Leicestershire, 1st May 1602. He was educated at the grammar-school of Ashby-de-la-Zouch; and went as an adventurer to London in 1620. There he was servant for some time to a mantua-maker; but in 1624 he became a domestic, and also clerk, to Mr Wright, master of the Salters' Company, in the Strand. Soon after his master's death, in 1627, Lilly married his widow, and receiving L.1000 as her dowry, he was released from the cares of any stated employment. After busying himself for some years in the interests of the Puritans, he began in 1632 to study astrology under Evans, a clergyman who had been expelled from his curacy for several frauds practised under the guise of his art. In 1633 he lost his first wife, and married a second with a dowry of L.500. He was employed in the following year to discover a treasure reported to be buried in Westminster Abbey, but while engaged at night in the presence of thirty others in poisoning his "Mosaical rods," a terrific storm arose, and scared the party. In 1644 appeared, for the first time, his almanac, entitled *Merlinus Anglicus Junior*, of which the first edition was sold in the course of a week, and which continued to be published annually for about 20 years. In the same year, three sons were seen on Prince Charles's birth-day; and Lilly, in 1645, publishing an interpretation of this phenomenon, under the title of the *Starry Messenger*, was charged before the Committee of Examinations with having, by certain passages in this book, incited the populace to insult the Commissioners of Excise, and burn the excise office. On its being proved, however, that these two offences had been committed previous to the publication of the *Messenger*, Lillo was acquitted. In 1647 Charles,

Lilly,
John
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Lilly,
William.

Lilybæum whilst under guard at Hampton Court, sent a messenger to him to inquire in what part of the country he might safely lurk should he contrive to escape from his enemies. **Lillye.** Lilly recommended some part of Essex, about 20 miles from London; an advice which circumstances did not suffer to be tested. Not more effectual were the *aqua fortis* and the saw which he sent to the king in 1648, to aid his escape from Carisbrook Castle. About the same time some important information touching the affairs of France, which he received from the confessor to one of the French secretaries, was communicated to the Council of State as the fruit of his astrology, and was rewarded with L.50, and an order for a yearly pension of L.100. In 1654 his second wife died, and he married a third. In 1659 the King of Sweden, who had been praised in his Almanac of 1657, presented him with a gold chain and medal. At the Restoration, he was apprehended by order of parliament, but sued out his pardon under the great seal. During the plague of 1665, after all his attempts to recommend his art to the ministry had failed, he retired to Hersham, and practised as a physician under a license from Archbishop Sheldon. In 1666 he was consulted about the great fire, and though he claimed to have predicted it and the plague fifteen years before, confessed his ignorance of its cause. He died in 1681 of a dead palsy, bequeathing a considerable property to a tailor whom he had adopted, and was buried at Walton-upon-Thames, where a monument was erected over his grave by his friend Ashmole.

Among his works are:—*Christian Astrology*, 1647; *Monarchy or no Monarchy in England*; *Grebner's Prophecy*; *Passages on the Life and Death of King Charles*, London, 1651; *Annus Tenebrosus*, 1652, and *History of his Life and Times from 1602 to 1681; containing Observations upon the Life and Death of Charles I.*, London, 1715 and 1721, and published, with notes by Ashmole, London, 1774.

LILYBÆUM (modern *Marsala*), in *Ancient Geography*, a city of Sicily, was situate on a promontory of the same name, forming the most westerly point of the island, and distant from Africa about 90 geographical miles. It was built and fortified by the Carthaginians, for the reception of the inhabitants of Motya, when that city was sacked by Dionysius of Syracuse, in B.C. 397. Owing to its fortified strength, its safe harbour, and its proximity to Africa, it soon became the chief stronghold of Carthaginian power in Sicily; and, in B.C. 276, successfully withstood a siege of two months from Pyrrhus, after all the other cities of Sicily had been reduced. During the first Punic war it baffled the besieging Roman troops for more than nine years, till it was ceded, at the close of the struggle, in B.C. 241, according to the conditions of the treaty of peace. Though only a Roman provincial town, it continued prosperous; and, in the second and third Punic wars, and for many years after, it was often the mustering-ground for forces about to invade Africa. After the ruin of the Roman empire, it passed successively into the hands of the Goths, Vandals, and Arabians. Some portions of an aqueduct, coins, vases, and pieces of sculpture, are among the few remnants of the ancient city.

LILYE, or **LILY**, **WILLIAM**, the eminent grammarian, was born at Oldham, in Hampshire, about 1466, and at eighteen entered Oxford, as a demy of Magdalen College. After taking a degree in arts, he travelled towards the East, and, according to Wood, visited Jerusalem as a pilgrim. Attracted to Rhodes, by the number of eminent men who had fled thither after the capture of Constantinople, he spent five years there, engaged in the study of Greek. He then repaired to Rome, and studied the ancient languages under Sulpitius and Sabinus. On his return to England, in 1509, having instituted a school in London, he was the first Englishman who taught Greek in

this country. In 1510 he was appointed first master of St Paul's school, by Dr Colet, the founder. In this new sphere he laboured for twelve years, numbering among his pupils several who afterwards rose to eminence. He died of the plague in February 1523, and was buried in the north churchyard of St Paul's.

Of the *Brevissima Institutio seu Ratio Grammatices Cognoscenda*, London, 1513, which is commonly known by the name of *Lily's Grammar*, he wrote only the English Syntax, the Carmen de Moribus, the Rules for the Gender of Nouns, and the Rules for the Præterperfect Tenses and Supines of Verbs. The preface to the first edition was written by Cardinal Wolsey; the English Rudiments by Dr Colet; and the Latin Syntax chiefly by Erasmus. This grammar has gone through innumerable editions, the last of which is that of London 1817. His other principal works are:—*In Ænigmatica Bossi Antibossicon primum, secundum, tertium, ad G. Harmanum*, London, 1521; *De Octo Orationis partium Constructione Libellus*, 1540; *Institutio Compendaria totius Grammaticæ*, London, 1542; *Monita Pædagogica*, Glasgow, 1693. He also wrote Latin verses, and translations from Latin and Greek. He is styled, by his friend Erasmus, "no ordinary scholar in classical literature, and a master in the art of tuition."

LIMA, the capital of Peru, is situate on the banks of the Rimac, in S. Lat. 12. 2., and in W. Long. 77. 8. 30., distant 6 miles from Callao by railway. It stands on a large and arid plain, fertilized only by irrigation, and rising gradually from Callao, on the shores of the Pacific. The general appearance of the city is imposing, when viewed from a short distance, the spires and domes glitter gaily in the sun, and the rich Moorish architecture fills the traveller with admiration. But on a nearer inspection the effect is somewhat disappointing. For although the public buildings are handsome, and the streets distinguished by great regularity, most of the houses are low and irregularly built. The walls are composed of mud bricks, and the roofs chiefly of planks of wood, on rafters that are often curiously carved, above which is a cane-matting, and a thin coat of plaster or mud, sometimes overlaid with flat tiles, on which they have their gardens of flowers, and shrubs in pots, &c. The houses of the poor in the suburbs have flat cane roofs covered with cane-matting and mud plaster. A singular feature is the stream of water, intended to carry away all refuse from the streets and houses, which runs down the centre of those streets that pass lengthwise through the city. It is let on early in the morning, and at night is turned off into the fields and orchards. Lima is entered by six gates; and the principal Alameda, an avenue of great beauty on the Callao road, is one of the finest approaches. The Plaza Mayor, or great square, is adorned with a splendid fountain, and is one of the principal business localities. On the north side of the square is the ancient palace of the Spanish viceroy, but now of the president of Peru. The side of it which fronts the square is certainly not remarkable for its beauty, having a range of small shops, above which are several of the state offices. On the east side are the archbishop's palace and the fine cathedral. On the other two sides there is a range of colonnades, with commodious shops, and a tessellated pavement, over which are the long balconies of the houses supported by them. The town-hall (cabildo) is one of the buildings supported by the colonnades on the west side, and the old palace of Pizarro (which is entered from the Callejon of Petateros) is, on the south side, not to be distinguished outwardly in any way from the adjacent balconied dwellings of the inhabitants. Besides the Alameda, to which reference has been made, there are two others, one of which possesses an immense amphitheatre for bull-fighting, capable of accommodating not less than 16,000 spectators.

The churches and convents of Lima are very numerous

Lima.

Lima.

Second in importance to the cathedral, is the convent of San Francisco, an establishment which occupies a large extent of ground. The church of St Domingo has a magnificent tower about 180 feet high. These monastic establishments have been much reduced in number since the revolution. Those which remain, however, are rich in gold and jewellery. In 1821 an immense mass of silver was taken from them and devoted to the necessities of the state; and in 1853 they have been plundered of valuable pictures of the Spanish school. The total number of churches now remaining is 56; 5 of which are parish churches, and many of them are attached to convents.

Of educational establishments, we may especially instance the University of San Carlos; and the National Museum, which has an admirable library of about 26,000 volumes; and a separate department, well stocked with Peruvian antiquities. This institution was, at one time, the most important in S. America. There are also various colleges appropriated to theology, jurisprudence, and medicine; and, in connection with the latter of these, there is an indifferent botanic garden. The schools are numerous, and tolerably well managed. Of charitable institutions, there are at present three public hospitals for the sick; namely, Sant-Ana, for females; San Andres and San Bartolome for males; one for foundlings, and an asylum for penitent women; besides the hospital for incurables.

Commerce in Lima is often disturbed by revolutions, which interfere with the security of public property, and transit to and from the interior. One-half the whole imports of Peru is from Great Britain; and that to the extent of not less than four or five millions of dollars yearly. The manufactures are of slight importance, consisting chiefly of glass, gold lace, silver filigree, and gilded leather. Although the country in the vicinity is very productive, the indolence of the people is such that they do not improve their advantages. Grapes, water-melons, and a variety of grains and vegetables are produced in great abundance. Immense quantities of live stock are fattened in the neighbourhood; the number of pigs killed for consumption is said to be about 20,000 a-year; and from 300 to 400 sheep, and from 40 to 50 oxen are brought daily into the market. At the corners of some squares old women sit cooking fish and pork, which the lower orders purchase instead of preparing food for themselves at home. The foreign trade of Lima is transacted through its port, Callao; and, indeed, the most of the goods consumed are the produce of other countries.

Like their Spanish ancestors, the people are gay, fond of exciting amusements, and little addicted to intellectual or useful pursuits. Morality is lax among all ranks; and there is a great amount of gambling and other kinds of dissipation. The walking dress of the ladies is only to be met with in this city and in Truxillo. It consists of two parts, called the *saya* and the *manto*. The former of these is a tight-fitting, but elastic petticoat, so made that the form of the limbs is distinctly discernible. The *manto* is a thick veil made of crimped black silk, drawn in by a band behind, and fastened round the waist; but being drawn up over the head, it is made to conceal the greater part of the face, and often the whole of it except one eye. A rich coloured shawl or scarf is sometimes thrown over the shoulders under the *manto*, so as to hang down nearly to the feet. The tight *saya* has been of late rather giving place to a looser and more graceful garment of the same kind; and, indeed, the costumes of England and France, which have long been worn by the ladies when within doors, are now becoming common as walking dresses.

The climate of Lima is very agreeable, although, perhaps, somewhat enervating. In winter, the mean temperature is 64° 1', and in summer, 77° 6'. A light drizzly mist prevails between May and October, but rain seldom falls. Earthquakes are of frequent occurrence, but the more de-

structive ones take place at intervals of from fifty to sixty years. In October 1746 a great number of important public buildings and dwelling-houses were destroyed in Lima. The port of Callao was at the same time devastated by the sea; and out of a population of about 5000 inhabitants, only 200, according to Ulloa, escaped.

Lima was founded by Pizarro in 1535, and at that time received the name of Ciudad de los Reyes (the City of the Kings). Since 1537 it has been the capital city of Peru, and the seat of the viceroys. In the sixteenth century it became an archiepiscopal see. The population of Lima is stained with every variety of shade between black and white; and this medley of race is not at all improved by the recent introduction of Chinese to supply the place of the now liberated negro.

The number of inhabitants, at the outbreak of the revolution for independence in Upper Peru, in 1810, was estimated at upwards of 80,000; and in the work of Ledesma, one of the judges of the Superior Court in the capital, published in 1853, he also states the population of Lima as then above 80,000; and, including its sea-port of Callao, and watering-place of Chorrillos, the whole population may be estimated at 100,000. At the close of the war of independence the population of Lima was reduced to about 54,000; but again, during General Castilla's prosperous administration, the capital, which is about 10 English miles in circumference, was rapidly re-peopled from the provinces.

In 1854-55, the yellow fever entered for the first time, and carried off its thousands; while in the valleys of the interior, Cuzco, &c., upwards of 200,000 perished by this epidemic.

LIMBORCH, PHILIP VAN, a theologian of the Arminian or Remonstrant party, was born at Amsterdam, 19th June 1633. After receiving a good elementary education in his native city, he entered the University of Utrecht in 1652, and studied there for two years. In 1657 he became minister of a Remonstrant church in Gouda; and, in 1658, was transferred to Amsterdam, where, in the following year, he added to his pastoral duties those of professor of theology to his own sect. He died in 1712. Many eminent men in foreign countries, and, among others, Locke and Tillotson, were his correspondents. His most important works are:—*Præstantium ac eruditorum virorum Epistolæ Ecclesiasticæ et Theologicæ*, Amsterdam, 1660, 1684, and 1704; *Theologia Christiana*, Amsterdam, 1686 and 1730, containing a full exposition of the tenets of the Remonstrants; *De Veritate Religionis Christianæ*, Gouda, 1687; *Historia Inquisitionis*, Amsterdam, 1692, translated into English, with an introduction by Dr Samuel Chandler, London, 1731. An English translation of his *Theologia*, with improvements from Wilkins, Tillotson, Scott, and others, was published by W. Jones, in 2 volumes, London, 1702. Limborch also edited the works of his relative, Episcopius.

LIMBURG, or LIMBOURG, a former province of the Netherlands, now belonging partly to Holland and partly to Belgium; bounded N. by Gelderland, E. by Rhenish Prussia, S. by the province of Liege, W. by those of South Brabant and Antwerp, and N.W. by that of North Brabant; and lying between N. Lat. 50. 42. and 51. 47., and E. Long. 4. 57. and 6. 17. To Holland belong all those parts of the province E. of the Maese, with the town of Maestricht, and all N. of a line drawn north-westwards from that river near Stephanswerd to a point near Hamont; the rest, or south-western portion of the province, belongs to Belgium. The area of the whole amounts to 1784 square miles, of which 932 are contained in Belgian Limburg, and 852 in Dutch Limburg. The physical aspect and products of both portions are very similar. The surface is flat, and in the N. occupied by an extensive marsh called the Peel; while on the Belgian side a considerable tract is covered with

Limbroch
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Limburg.

Lime moor and sandy plains. The River Maese traverses the province throughout its entire length, and receives several tributaries, the chief being the Roer, which joins it at Roermond, in the Dutch portion. Along the banks of that river the soil is well adapted to agricultural purposes, and produces grain of various kinds, flax, hemp, tobacco, rape seed, madder, and fruits. Extensive and well-stocked pasturages occupy the western parts of both Belgian and Dutch Limburg, but especially the former, where horse breeding and the tending of bees are carried on to some extent; while, among the Hollanders, pig rearing and the dairy receive more attention. In minerals the province is deficient. Some lime quarries are worked in the S., where also iron, calamine, and lead exist to a small extent; while coal, potters' earth, and building stone are found in the N. The manufactures are more important, and are about equally numerous in both parts. Among the Belgians the principal articles of manufacture are beet-root sugar, salt, tobacco, soap, and straw hats; besides which, the Dutch manufacture cotton, paper, glass, and gin. The following shows the area, arable acreage, and population of the province:—

Province.	Area.	Arable acreage.	Pop. 1850.	Pop. 1855.
Belgian Limburg ...	596,372	243,442	188,198	193,550
Dutch Limburg	545,006	352,259	205,261	210,831
Total	1,141,378	595,701	393,459	404,381

The history of this province is intimately connected with the foreign and civil wars of the Low Countries. It was a duchy, and formed one of the United Provinces under the rule of Charles V. of Spain. It was ceded to France by the Batavian republic in 1795, but afterwards was restored to the Netherlands. After the revolution of 1830, however, it was, according to the treaty of 1839, divided between Holland and Belgium; the former giving to its portion the title of Duchy. The capital of Dutch Limburg is Maestricht, with 27,000 inhabitants; and of Belgian Limburg, Hasselt, with a population of 10,000.

LIME. See CHEMISTRY (*Calcium*), and BUILDING.

LIMERICK, an inland county of the province of Munster, in Ireland, is bounded on the N. by the estuary of the Shannon (from which it derives the advantages of a maritime county) and Tipperary, on the E. by the same county, on the S. by the county of Cork, and on the W. by Kerry. According to the ordnance survey, it comprises an area of 1061 square miles, or 680,842 acres, of which 526,876 are arable, 121,101 uncultivated, 11,575 in plantations, 2759 in towns, and 18,531 under water. Of the 121,000 acres of uncultivated land, it has been estimated that 30,000 acres might be improved for cultivation, 40,000 acres might be drained for pasture, and 51,000 acres, situate chiefly on the high levels in the Galtees and Slieve Phelim Mountains, may be considered as unimprovable.

It was formerly inhabited by the tribe of the Velaborii. The principal Irish families in the county were the O'Briens, O'Grady's, O'Gormans, M'Enerys, M'Sheehys, Moronys, M'Mahons, and O'Quins. At the commencement of the thirteenth century, the Anglo-Norman proprietors, who had obtained grants of land, introduced colonists, chiefly from Bristol and Chester, into the rich lands about the city of Limerick and the northern part of the county. In 1586, the estates of the Earl of Desmond became forfeited, and those situate in this county, amounting to nearly 100,000 acres, were granted by the crown to Sir William Courtenay, Sir George Bouchier, Sir George Thornton, Sir Henry Uthered, Sir Henry Billingsley, Robert Annesley, William Carter, Edward Mannering, Robert Stroude, William Trenchard, Edward Berkeley, and Richard Fitton. Much of it

was confiscated in the time of Cromwell, since which period the proprietorship of the soil has mostly devolved upon settlers of English descent. The county is now divided into the fourteen baronies of Clanwilliam, Upper and Lower Connello, Coonagh, Coshlea, Coshma, Glenquin, Kenry, Kilmallock, North Liberties, Ownybeg, Pubblebrien, Shanid, and Small County, which are again subdivided into 131 parishes.

According to the ecclesiastical arrangements of the country, the county is in Limerick and Emly dioceses, and three or four parishes in those of Cashel and Killaloe. The see of Limerick is one of the few unaffected by the changes introduced into the ecclesiastical divisions of Ireland. It is still, as before, united with those of Ardfert and Aghadoc in Kerry. The cathedral, an ancient structure of considerable extent, but of no external beauty, stands in the city of Limerick; and the bishop's palace, a modern mansion, is situate on the bank of the Shannon, at the western extremity of the city. The chapter consists of a dean, precentor, chancellor, treasurer, and archdeacon, and has eleven prebendaries. The see of Emly, united with that of Cashel, has thirty-eight parishes in the county of Limerick, and twenty in Tipperary.

The face of the country, though diversified by numerous small hills, is not mountainous, except on the S.E., where it is bounded by the Galtees, the finest inland range of mountains in Ireland, which rise to an elevation of 3008 feet, and extend into the adjoining county of Tipperary. On the borders of Kerry the surface also rises into a grand amphitheatre of low but steep mountains, that spread themselves out in a wide curve from Loughlin to Dromcollogher. The Shannon forms the boundary of the greater portion of the northern part of the county, and is navigable for large vessels from Limerick to the sea. That portion of the river between Limerick and Killaloe (12 miles) is not navigable, on account of the rapids and shallows which occur. The River Shannon, which measures 240 miles in length from its source to the sea, has a total fall of 174 feet, 97 of which are within those 12 miles. The only river of any size is the Maig, which rises in the Galtees, and discharges itself into the Shannon, W. of Limerick. It is navigable by barges from the Shannon to the town of Adare. The Feale and the Gale, which rise in the western mountain range, are considered as belonging to Kerry, and the Blackwater, which rises in the same range, to Cork. The county is well watered by numerous smaller streams. There are no lakes of any importance in this county.

The soil in the level parts is considered as the richest in Ireland. Arthur Young said of this county and Tipperary: "It is the richest soil I ever saw, and such as is applicable to every wish. It will fatten the largest bullock, and at the same time do equally well for sheep, for tillage, for turnips, for wheat, for beans, and, in a word, for every crop and circumstance of profitable husbandry." The Golden Vale, a district which obtained its name from the remarkable exuberance of its fertility, lies mostly in this county. Along the banks of the Shannon are large tracts of marsh land, called Caucasses, also celebrated for their richness; a circumstance attributed to the quantity of alluvial mould deposited there by the Shannon when it overflows its banks. In a geological point of view the low country forms part of the great limestone plain of Ireland; but the mountainous district in the S. and W. consists chiefly of the old red sandstone, with clay-slate appearing in the loftier portions of the county. After leaving Lough Derg, the River Shannon passes through a gorge in this mountain range at Killaloe, and is precipitated down the rapids of Doonas and Castle-roy towards Limerick. At Castleconnel, a town beautifully situate, is a fine chalybeate spring, of great celebrity from its sanative effects.

The number of inhabitants at the following periods was:—

Limerick.

1760.....	De Burgho.....	92,376
1792.....	Beaufort.....	170,000
1821.....	Parliamentary return.....	277,477
1831.....	Ditto.....	315,355
1841.....	Ditto.....	330,029
1851.....	Ditto.....	262,136

The Irish language is understood by nearly thirty per cent. of the population, and upwards of 7000 cannot speak English. As regards the religious persuasion of the inhabitants, there are no accurate returns, but there can be no doubt that the Roman Catholics form at least nine-tenths of the population of this county.

The number of schools in the city and county of Limerick, and the children attending them, in the week ended 12th April 1851, was:—

CITY OF LIMERICK.	No. of Schools.	No. of Scholars.		
		Male.	Female.	Total.
National.....	4	...	1255	1255
Diocesan.....	1	20	...	20
Endowed.....	4	237	278	515
Boarding.....	6	66	148	214
Private.....	41	848	419	1267
Parochial.....	2	55	122	177
Free.....	4	881	24	905
Military.....	1	16	18	34
Workhouse.....	2	792	854	1646
Charitable Boarding.....	2	...	47	47
Total.....	67	2915	3165	6080
COUNTY OF LIMERICK.				
National.....	60	2,764	2632	5,396
Church Education.....	7	185	133	318
Endowed.....	1	24	28	52
Private.....	160	3,762	2764	6,526
Parochial.....	25	626	555	1,181
Free.....	1	46	87	133
Mission.....	1	32	42	74
Workhouse.....	19	2,814	2077	4,891
Total.....	274	10,253	8318	18,571

At the same period, in the city of Limerick, 37½ per cent., and in the county 51 per cent., of the population, five years old and upwards, are returned as being unable to read or write.

The county returned eight members to the Irish parliament: two for the county at large, two for the city of Limerick, and two for each of the boroughs of Askeaton and Kilmallock. The boroughs having been disfranchised at the Union, the number of representatives sent to the imperial parliament was fixed at three—two for the county, and one for the city. The Reform Act added one representative to the latter place.

The land in the level parts is divided into large farms, many of which are almost exclusively devoted to grazing. In the more hilly region the farms are smaller, and in some parts cut up into holdings much too small for the profitable culture of the soil, or the comfortable support of the cultivators. In the year 1709, a colony of Palatines, brought from Germany by Lord Southwell, settled near Bruff, Rathkeale, and Adare. They tended much to improve the state of agriculture, as also that of the linen manufacture. The rich lands on the borders of the rivers produce a kind of flax very different from that of the north; it grows to a great height, and is well adapted for sail-cloth. Hemp was formerly cultivated extensively on the lands of the same quality. The exportation of cattle and grain is very considerable, constituting the main source of the wealth of the inhabitants.

The extent of land under each description of crop in Limerick, 1854, 1855, and 1856, was:—

	1854. Acres.	1855. Acres.	1856. Acres.
Wheat.....	14,427	17,149	22,577
Oats.....	45,009	45,455	42,131
Barley, Bere, Rye, Beans, and Pease.....	15,343	12,057	7,537
Potatoes.....	33,282	35,723	43,428
Turnips.....	11,612	11,394	9,860
Other Green Crops.....	2,749	2,771	2,877
Flax.....	316	243	230
Meadow and Clover.....	69,117	71,292	72,330
Total.....	191,855	196,084	200,970

The quantity of live stock in the county in 1854-56 was as follows:—

	1854. No.	1855. No.	1856. No.
Horses.....	17,111	17,206	17,782
Cattle.....	158,874	159,710	160,421
Sheep.....	86,376	80,914	77,156
Pigs.....	69,214	61,733	50,346

The occupations of the people are almost exclusively agricultural. Their dwellings are poor, their food chiefly the potato; their fuel is turf, except in the immediate neighbourhood of the city, where British coal is much used.

The county possesses many remains of antiquity. The most remarkable of the ancient monastic buildings are in the city of Limerick, where, besides the cathedral, there was a Dominican friary founded by Carbreagh O'Brien, King of Thomond, in which he was interred. Some remains of the monument erected to his memory still exist. In the same city was an Augustinian friary, a convent of black nuns, a Franciscan friary, and a preceptory of knights-templars, besides several other minor religious establishments. Amongst the most admired of the many fine monastic ruins in various parts of the county is the Abbey of Adare.

The city of Limerick, the capital of the county, is situated on the Shannon, about 100 miles from its mouth, partly on an island, and partly on the mainland. It is the fourth city in Ireland in population and importance, being surpassed in these respects only by Dublin, Belfast, and Cork. The number of its inhabitants, in 1851, was 48,961. The city consists of three principal divisions,—the old town, divided into Irish and English Town; and Newtown Pery. The first is the most ancient, having been built before the arrival of the English in 1172. The second occupies King's Island, on the Shannon, and was formerly a strongly fortified position; both these portions consist chiefly of poor streets, and low village-like houses. The third was commenced in 1769, by Mr Sexton Pery, from whom it takes its name. It is laid out along the eastern banks of the river in streets, intersecting each other at right angles with geometrical precision, and contains many handsome streets of elegant houses, and squares, and public buildings of considerable pretensions. The city was formerly considered as the strongest place in Ireland. In 1174 it was taken by the English, but shortly afterwards evacuated and burned, to prevent its occupation being serviceable to the enemy. In 1651 it was taken by Ireton, Cromwell's lieutenant-general, after a vigorous resistance; and in 1690, its garrison baffled the army of King William, who conducted the siege in person; but it surrendered on terms the next year to General De Ginkel, on which occasion the celebrated treaty of Limerick was concluded. Most of the walls and gates have been demolished, and quays, warehouses, and streets, built on their site. The different parts of the town are connected with each other by bridges, of which the most remarkable, Thomond Bridge, leading from King John's Castle to Thomond Gate, has been lately rebuilt; and Wellesley Bridge, erected in 1827, one of the finest speci-

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mens of this kind of architecture in the island. Besides the cathedral, and three parish churches, and two chapels of ease of the Established church, there are eight Roman Catholic places of worship. The Methodists, Presbyterians, Baptists, Independents, and Quakers have each a meeting-house. The chief public buildings are,—the court-house, the custom-house, the gaol, the commercial buildings, the lunatic asylum, the union workhouse, &c. The city was originally incorporated by King John, whose charter was confirmed and extended by several succeeding sovereigns. It was first governed by a bailiff, but obtained the privilege of electing mayors and sheriffs ten years before that right was conferred on London. The corporation, styled the "Mayor, Aldermen, and Burgesses of Limerick," now consists of 8 aldermen and 32 town-councillors. The charitable endowments are numerous, and some of them extensive. The manufacture of linen has been revived of late years; and Limerick is also celebrated for the manufacture of lace, gloves, and fishing-hooks. There are also several breweries, distilleries, tanneries, foundries, and flour-mills. The exports chiefly consist of provisions and grain. The imports are,—coal, turf, timber, wine, spirits, and all articles of British and foreign production. The navigation from the Atlantic to the city is open and secure, and the inland navigation connects it with Dublin and all the intermediate line of country. Vessels of 1000 tons can approach within five miles of the city, and those of 600 tons can unload at its quays. The harbour extends about 1600 yards in length, and 150 in breadth, with from 2 to 9 feet at low water, and 19 at spring tides. In 1835 the exports were valued at L.726,430, and in 1842, at L.1,200,000. The number of vessels entered inwards, in 1855, was 601, of 83,585 tons. Eleven vessels, of about 1760 tons in all, belonged to Limerick shipowners in 1832. In 1855, 88 vessels, of 12,090 tons, were registered as belonging to the port.

The other towns of some note in the county are,—Rathkeale, Shanagolden, Ballingarry, Newcastle, Adare, Askeaton, and Castleconnell. Kilmallock is more remarkable for its remaining vestiges of former greatness than for its present condition. It was the second town in the county, having a charter of incorporation, being surrounded by substantial fortifications, and consisting of a number of large houses, durably constructed of cut stone, and belonging to the age of Elizabeth and James I. (H. S.—R.)

LIMITED LIABILITY. See PARTNERSHIP.

LIMOGES (ancient *Augustoritum Lemovicum*), a town of Central France, formerly capital of the province of Limousin, now of the department of Haute-Vienne, on the right bank of the Vienne River, here crossed by three bridges, 115 miles N.E. of Bordeaux; N. Lat. 45. 49. 52., E. Long. 1. 15. 36. It is situated on an acclivity, which rises from the water side; the older parts of the town occupying the ground near the river, while the new town stretches over the summit of the hill. The streets of the former are narrow and tortuous, with mostly timber-built houses; but the modern portion has been elegantly laid out in regular streets and squares, with public fountains. In place of the old fortifications, boulevards now encircle the town, which is also adorned by many interesting edifices. The chief building, the cathedral of St Etienne, was begun in the thirteenth, and received additions up to the sixteenth century, when it was left still unfinished. It is of granite, and in the Gothic style of architecture, but is much mutilated; and, with the exception of bas-reliefs representing the labours of Hercules, and the tomb of Bishop Langeac, contains nothing worthy of notice. The church of St Michel-aux-Lions, erected in the fourteenth century, occupies the highest site in Limoges, and is rendered still more prominent by its spire and tower, which rise far above all the adjacent buildings. Among the other remarkable edifices

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are the episcopal palace, a handsome structure built of granite; and the church of St Aurelian, with a very elaborately carved cross in front. The town also contains a college, a public library, with 12,000 volumes, a school of medicine, and several hospitals. It is the see of a bishop, and has courts of appeal, tribunals of first instance and commerce, and a council of *prud'hommes*. The trade of the place is important, and embraces principally the products and requirements of the surrounding country. It has likewise a large trade with the southern departments of France in grain, wine, brandy, liqueurs, and chestnuts; besides salt, iron, tin, and enamel. Kaolin clay, which abounds in the vicinity, is made here into excellent porcelain, and is also sent as raw material in large quantities to Sèvres. Cloth, worsted, woollens, paper, crucibles, and papier-mâché are the other chief articles of manufacture. A large monthly cattle-market is held here, and nine annual fairs.

In ancient times Limoges was the chief city of the Lemovices, and was much enlarged and improved under the Romans; a theatre, a citadel, and temples were erected, of which no remains are now extant. At the fall of the Roman empire, however, it was pillaged by the Vandals and Visigoths, and was afterwards taken in succession by the Franks and Normans. In modern times it has suffered much from sieges. Having revolted from the Plantagenets, it was besieged by Edward the Black Prince in 1370, taken by assault, and its inhabitants delivered over to the English soldiers, who treated them with great barbarity. It was recovered by the French two years after. The town was the birthplace of many great men, of whom the chief are,—Pope Clement VI., the Chancellor d'Aguesseau, Vergniaud the republican orator, Marshal Jourdan, and Cruveilhier the physician. Pop. (1851) 37,010.

LIMOUSIN, or LIMOSIN, a former province of Central France, now represented by the department of Corrèze and the greater part of that of Haute-Vienne.

LIMOUX, a town of France, capital of a cognominal arrondissement, department of Aude, 18 miles S.S.W. of Carcassone. It is pleasantly situate in a fertile valley of the N. Pyrenees, on both sides of the Aude, and is surrounded with vineyards, where the celebrated Blanquette and Limoux wines are made. The town is well laid out, and possesses several public fountains. There are also a college, a theatre, an hospital, and tribunals of first instance and of commerce. The manufactures of the place comprise broadcloths, woollens, soap, leather, and oil; and a brisk trade in wines and iron is carried on. Pop. (1851) 7188.

LINACRE, THOMAS, a learned physician, was born about 1460, at Canterbury, and educated there under the accomplished William Selling. After studying at Oxford, and becoming fellow of All-Souls' College in 1484, he set out for Italy with his former instructor Selling, who had been appointed ambassador from Henry VII. to the court of Rome. Settling down at Florence, he was permitted by Lorenzo de' Medici to attend his sons' preceptors, and progressed rapidly in Greek under Chalcondylas, and in Latin under Angelo Poliziano. He then removed to Rome, where, applying himself to the study of natural philosophy and physic, he became more intimate with Aristotle and Galen in the original than any Englishman before him. On his return to England he received the degree of M.D., and the appointment of public professor of physic from the University of Oxford; but was called to court by Henry VII. to be physician and tutor to Prince Arthur. He was afterwards successively physician to Henry VII., Henry VIII., and the Princess Mary. In the reign of Henry VIII. he founded two lectures on physic at Oxford and one at Cambridge; and in 1518, chiefly through his influence, letters-patent were issued for the foundation of the College of Physicians in London, vesting in that body the right of examining all medical practitioners in the capital,

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and within 7 miles around it, and of licensing all physicians throughout the rest of the kingdom who were not graduates of Oxford and Cambridge. Of this college Linacre was the first president, and held that office till his death. Having commenced to study divinity late in life, he was presented in 1509 to the rectory of Mersham, a benefice which he exchanged in the same year for a prebend in the church of Wells. In 1518 he became a prebendary, and in 1519 precentor in the Church of York. Resigning the latter office, he obtained more preferments, and, among others, a prebend in St Stephen's Chapel, Westminster, and the rectory of Wigan, in Lancashire. He died under a severe attack of the stone, on the 20th of October 1524, and was buried in St Paul's Cathedral. Thirty years afterwards, a monument was erected over his grave by Dr Caius.

Linacre was esteemed in his own day, not less for his private virtues than for his unrivalled skill as a physician. His character as a scholar is established on the high authority of Erasmus, who says, "that his translations of Galen speak better Latin than before they ever spoke Greek." As a restorer of classical learning in England, he ranks with Colet, Lily, Grocyn, and William Latimer.

His translations from Galen are,—*De Temperamentis*, Cambr. 1521; *De tuenda Sanitate*, Cambr. 1517, Paris, 1530; *De Methodo Medendi*, Paris, 1526; *De Naturalibus Facultatibus*, London, 1523 and 1723; *De Pulsuum Usu*, London, 1522; *De Symptomatum Differentiis unus liber*; *Ejusdem de Symptomatum Causis libri tres*, London, 1524. His other works are,—A translation of *Proclus de Sphæra*, printed in the *Astronomi Veteres* of 1499; *De Emendata Structura Latini Sermonis libri sex*, London, 1524, frequently reprinted; *The Rudiments of Grammar*, written for the use of the Princess Mary, and translated into Latin by George Buchanan. In conjunction with Grocyn and Latimer, he began a translation of Aristotle, which was never finished.

LINARES, a town of Spain, province of Jaen, on a plain near the right bank of the Guadalimar, and under the Sierra Morena, 23 miles N.N.E. of Jaen. It has long been celebrated for its mines of lead and copper, which are still very productive. Near it was won Scipio's great victory over Hannibal; and the chief fountain of the town is supposed to be of Roman origin. Pop. about 7000.

LINCOLN, an ancient city of England, capital of the county of that name, 132 miles N.W. from London. It is situate on the summit and declivity of a considerable and very steep eminence which rises on the N. side of the River Witham at its confluence with the Foss Dyke Canal. Lincoln occupies the site of the Roman Station *Lindum*, the form of which may still be clearly traced; and one of the most interesting objects in the city is the ancient Roman archway called Newport Gate, which formed the barrier on the north side of the city. The town, as a whole, is not well built; and the streets leading from the lower to the upper town are too steep to be ascended by carriages, which make use of another road round the face of the hill without the city. The chief attraction of Lincoln is its cathedral, which stands on the very summit of the hill, and thus, both from its situation and its stately and towering grandeur, forms a conspicuous and magnificent object. It was founded in 1086, but was rebuilt subsequently to a fire in 1126, by which the greater part of it was destroyed. Its form is that of a very long double cross, with a transverse limb at the west end, like a pedestal made by the unusual breadth of the west front. There are two towers at the western front, each 180 feet high, and one great central tower 300 feet in height. Its interior dimensions are,—entire length, 482 feet; width of choir and nave, 80 feet; height of ditto, 80 feet; width of west front, 174 feet; length of principal transepts, 222 feet; breadth of ditto, 66 feet. The west front, two circular windows, the choir and screen, and the Lady Chapel, are

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peculiarly beautiful and interesting. The celebrated bell, the Great Tom of Lincoln, cast in 1610, was cracked in 1827, and broken up in 1834 to form, with six others, the present large bell, and two quarter bells, now in the central tower. It is 6 feet 10½ inches in diameter at the mouth, and weighs 5 tons 8 cwt.,—nearly a ton more than the old bell. On the north side of the cathedral are the cloisters, in which is preserved a Roman pavement. The library contains some curious specimens of Roman antiquities. In the cathedral are numerous monuments, including those of Catherine Swinford, wife of John of Gaunt, their daughter Joan, Countess of Westmoreland, and several bishops and deans of the cathedral; but many of the older monuments have been removed, or were totally destroyed during the civil wars. The other buildings worthy of notice are the chapter house, the ruins of the bishop's palace, destroyed during the civil wars, the remains of the castle, with the county jail and court-house, guild-hall, city jail, assembly rooms, theatre, &c. The city abounds in antiquities, and especially in monastic and other ecclesiastical remains. There are thirteen other churches of the Establishment (only about one-fourth of the numbers said to be standing at the Reformation), besides various dissenting places of worship. There are also a free grammar school, mechanics' institute, mutual improvement society, libraries, museum, county hospital, dispensary, lunatic asylum, &c. The markets of Lincoln have, within the last few years, been greatly enlarged and improved. It carries on a large trade in flour by means of the Foss Dyke Canal, connecting the Witham and Trent, and the railways which connect it with all parts of the kingdom. There are several large steam flour mills and several breweries in the town. Lincoln at the time of the Norman Conquest was one of the most important places in the kingdom. William the Conqueror caused a strong castle to be erected here in 1086. King Stephen was defeated and taken prisoner here in 1141 by Robert, Earl of Gloucester, natural brother to the Empress Maud. Lincoln was the scene of important operations during the civil wars in the reign of King John; and here the party of the Dauphin was completely overthrown by the Earl of Pembroke, during the minority of Henry, III. During the great civil war, the royalists obtained possession of the city, but it was stormed by the parliamentary army under the Earl of Manchester, 5th May 1644. Lincoln is governed by a mayor, 6 aldermen, and 18 councillors, and returns two members to parliament. Pop. (1851) 17,536.

LINCOLNSHIRE, a maritime county of England, on the E. coast, bounded N. by the estuary of the Humber, N.W. by Yorkshire, W. by the Trent and Nottinghamshire, S.W. by the counties of Leicester and Rutland, S. by those of Northampton and Cambridge, and E. by the North Sea. It is 73 miles in length from N. to S., by 46 miles in breadth; and contains an area of 2776 square miles, or 1,776,738 acres, being the second largest county in England. The shire is divided into three trithings or districts, viz.,—Lindsey, Kesteven, and Holland. The first is by far the largest division, and includes the whole of N. Lincolnshire; its boundary line reaching as far S. as the Foss Dyke and River Witham; following the course of the latter to a point opposite Thornton-le-Fen, where it crosses the country to the sea near Friskney. Kesteven trithing, on the other hand, comprehends the S.W. part of the county, while Holland occupies the flat lands of the Wash. These divisions are again subdivided into wapentakes, soles, and hundreds; amounting, in all, to thirty "parts."

The aggregate population of the whole county was, in 1821, 283,058; in 1831, 317,465; in 1841, 362,602; and in 1851, 407,222. The numbers of males and females in 1851 were,—males, 205,083; females, 202,139; showing a marked deficiency in the latter. Of towns containing

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more than 5000 inhabitants, in 1851, in this county, there were eight, viz.,—Lincoln, with 17,536; Boston, 17,518; Great Grimsby, 12,263; Grantham, 10,813; Louth, 10,467; Stamford, 8933; Spalding, 7627; Gainsborough, 7506.

In relation to the character of its surface, Lincolnshire may again be divided into three parts—the Wolds, the Heaths, and the Fens; which occupy positions corresponding generally with the three territorial divisions mentioned above. The Wolds are chalk downs which traverse the N. part of the county, from Barton to Burgh, in a S.E. direction for nearly 50 miles, and have an average breadth of 6 miles. They form the back-bone of the geological formation of the shire; and are skirted on the W. by a band of green-sand and one of iron-sand, which form another range of uplands running almost parallel with the Wolds. The Heaths occupy the land W. of the Wolds, stretching N. and S. from the Humber to Grantham. Their formation belongs to the Oxford clay, and widens in extent as it proceeds southwards until it ultimately dips under the fen land near the last-named town. The north-western corner of the shire is occupied by Permian strata, which follow the Trent into Nottingham, and westwards into York. Gypsum is found in the Isle of Axholme. The Fens cover the rest of Lincolnshire, from Wainfleet in the N., to the southern boundaries of the county, occupying the greater part of the district called Holland. They are intersected in every direction by drains, some of which are navigable; and the soil is now very productive. (See BEDFORD LEVEL.)

The principal rivers in the county are the Trent, Witham, Ancholme, Welland, and Nene, with their tributaries. The first enters Lincolnshire from Notts, a little above Rampton, when it becomes the boundary between the two shires, and continues to be so until it receives, on the left, the waters of the Idle. About a mile below its junction with that stream, the Trent leaves Nottingham, and flows in a northerly course through Lincolnshire for nearly 20 miles, when it falls into the Humber, by a mouth a mile in width. The Trent becomes navigable for vessels drawing 12 feet of water at Gainsborough; whilst its waters are affected by the tide for some miles above that town. It forms the eastern boundary of the Isle of Axholme, which is inclosed on the S. by the Idle, and on the W. by the old River Don. The former stream is navigable for small craft as far up as E. Retford. Although not so large as the Trent, the Witham is the most important river of Lincolnshire. It rises in Rutland, enters Lincoln near S. Witham, and flows northwards through a comparatively high valley to Grantham. From this it continues, for a short distance, its northern course, then turns to the W.; and again, at Long Bennington, changes to N.E., in which direction it flows to the town of Lincoln, where it receives the Brant on the left. Here the river becomes navigable for barges, and is connected with the Trent by the Foss Dyke Canal. Here, also, it enters on the flat lands, flowing first E. as far as Bardney, where the Langworth and S. Beck are received on the left; then, turning gradually to the S.E., reaches Tattershall, where it is joined on the right by the Sleaford, and on the left by the Bain. From Tattershall to Boston the Witham occupies an artificial bed; but from the latter town to the Wash it keeps its natural course. Vessels of 300 tons can ascend to Boston. North Lincolnshire is drained by the Ancholme, which rises near Spirdlington, flows northwards till it enters the Humber, near Ferraby, and is navigable for about 20 miles. The Welland enters South Lincolnshire at Stamford, where it is navigable, and keeps an eastern course to Market Deeping. Six miles therefrom it penetrates the county of Lincoln; and, after receiving the Glen near its mouth, enters the Wash. Connected with all these rivers, there are extensive drainage and canal systems, which have, in some cases, taken the place of the natural courses of the

streams. In the trithing of Holland, especially, draining has been carried on so universally, that it is difficult to discover whether the streams are natural or conducted by the hand of man. This system, indeed, has rendered the soil of this part of Lincolnshire one of the most productive in England, when, formerly, it was little better than moor or bog.

The climate of the shire is as good as in most of the other English counties, except in those flat lands that have not been thoroughly drained, where cases of ague are not unfrequent among the inhabitants. The soil is varied, but generally very rich. In the Fens it produces excellent pasture, and in some parts extraordinary crops of grain, particularly oats. Here, however, the water is bad; and still considerable tracts of land are fit for no more profitable purpose than the breeding and rearing of geese. These are kept principally for the sake of their quills and feathers, which are plucked four or five times in the year. During breeding season they are lodged in wicker pens, closely attended by a herd. The Fens were long the resort of vast flocks of wild fowl, the entrapping of which formed an important branch of employment to the inhabitants; but of late years their numbers have been so reduced that they now only engage the attention of the sportsman. The aquatic birds which still frequent the marshy portions of Holland are chiefly swans, wild geese, mallards, shovellers, godwits, and occasionally spoonbills. Agriculture is conducted with considerable skill and judgment in this county; and the land produces ample crops of wheat, oats, barley, and beans, and in some parts hemp and flax. In the Wolds, where the soil is chalky, sainfoin is sometimes grown besides the usual crops; while cabbages and carrots are found to succeed well in those parts of the W. and S.E. of the county where the soil is found most suited for their production. Wherever the soil is apt to grow thin, the farmers here are in the habit of making the streams or "cuts" overflow their banks, and thus deposit a layer of rich silt on which beans, oats, and woad are produced. But however well adapted some parts of Lincolnshire are to the growing of grain, it is undoubtedly on the whole a pastoral county, as it has perhaps the richest grass grown in the kingdom. Breeding and rearing of cattle, sheep, and horses, for the London market, form the main pursuits of the population. The two original breeds of cattle in the county were the Lincolnshire short-horned, and Leicestershire long-horned; but these have been much improved by frequent and judicious crossings, and the oxen of Lincolnshire are now proverbial for their excellence. There are also many cattle from other parts fattened here for the metropolitan market. Of sheep, the principal breeds are the native Lincoln and New Leicester. The former are of large size, and produce heavy fleeces of long wool. Their flesh, however, has a rankish flavour, and is not generally relished. The New Leicester, on the other hand, obtained by crossing the native race with other breeds, has now become more numerous, and is highly prized. The total number of sheep in the county has been estimated at two millions and a half, and the yearly produce of wool at twenty million pounds. Lincolnshire has also been long famous for its breed of horses, including drays, hunters, and carriage horses. They are generally reared on the uplands, but afterwards removed to the "flats," to get flesh before being sent to Horncastle, the great horse market of the shire. Some good breeds of swine are to be found in the county, but less attention has been directed to them than to cattle. Stilton cheese is made here, but there are few large dairies, as most of the farmers keep milk cows only for domestic use. Manufacture is almost wholly wanting in Lincolnshire, and trade is consequently confined to natural produce, such as grain, cattle, wool, and feathers. In minerals it is likewise deficient, with the exception of excellent freestone, quarried near Ancaster, in Kesteven; sul-

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phate of lime, found in the Isle of Axholme; and some lime burnt in the Wolds. Means of communication are, however, abundant both by rail and canal, as well as by the sea coast. The Great Northern Railroad crosses the S.W. corner of the county through Grantham, and sends a branch along its eastern border by Spalding, Boston, Alford, and Louth to Great Grimsby, with a sub-branch from Boston to Lincoln. From the Midland Railway at Nottingham a line goes to Lincoln, and thence, by Market-Rasen, to Blanford Brigg; while the Manchester and Sheffield line sends a branch by Gainsborough to the same place, and then northwards to New Holland, and southwards to Great Grimsby. Canals are still more numerous; in fact, no county in the United Kingdom is so well supplied with such channels of communication. The principal ones are the Foss Dyke, connecting the Trent and Witham; the Car Dyke, connecting the Welland and Witham; the Stainforth and Keadley Canal, connecting the Don and Trent, across the Isle of Axholme; the Louth Canal, running between that town and the Humber; the Sleaford Navigation, communicating with the Witham; and the Grantham and Nottingham Canal. The sea coasts of Lincolnshire are not, however, favourable for navigation. From the Wash to the Firth of Humber, the shore is low and lined with sandbanks, except near Grimsby, where it rises into cliffs. In the basin of the Wash are many sandbanks which become dry at low water; the greatest depth of water is at Boston Deep, where it averages from 3 to 8 fathoms. A sea-wall extends also along the coast of this estuary from the Welland to the Nene, to protect the land from the encroachments of the sea. There are three chief seaports in Lincolnshire,—New Holland, on the Humber, opposite Hull; Great Grimsby, at the mouth of the Humber, carrying on a pretty extensive foreign trade; and Boston, on the Witham, 6 miles from the sea, which exports the produce of the county, and imports from the Baltic. Gainsborough, situate on the Trent, 21 miles from the Humber, has also a considerable export and import trade; vessels of 300 tons being able to ascend to the town.

Lincolnshire returns 13 members to parliament,—2 from Lindsey, or North Lincoln; 2 from Kesteven and Holland, or South Lincoln; and 9 from the boroughs of Lincoln (2), Boston (2), Grantham (2), Stamford (2), and Great Grimsby (1). The place of election for North Lincoln is Lincoln, and for South Lincoln, Sleaford. This county also belongs to the Midland Circuit; and the assizes are held in Lincoln, where the county jail is situate; while the quarter sessions are held throughout the county. According to the Poor Law Commission, the shire is divided into the 14 unions of Boston, Bourne, Caistor, Gainsborough, Glanford-Brigg, Grantham, Holbeach, Horncastle, Lincoln, South Sleaford, Spalding, Spilsby, and Stamford. Ecclesiastically, the county belongs to the diocese of Lincoln and province of Canterbury. In 1851 there were 1501 churches in the shire, with 281,266 sittings. Of the former, 657 belonged to the Established Church, 703 to the Methodists, 62 to the Baptists, 38 to the Independents, and 13 to the Roman Catholics. There were also in that year 1420 day schools in the county, with an aggregate of 52,163 scholars; 457 of the former being public, with 32,267 scholars; and 963 private, with 19,896 scholars. Of Sunday-schools in the same year, there were 880, with an aggregate of 57,120 scholars. 432 of these belonged to the Established Church, and 318 to the Methodists. There were also 23 literary and scientific institutions, with an aggregate of 22,654 volumes in their libraries, and an average of 120 members to each association. The principal mansion-houses in the county are,—Aswarby Hall, Whichcote, Bart.; Belton Park, Earl Brounlow; Blankney Hall, C. Chaplin, Esq.; Brocklesby Park, Earl Yarborough; Buckminster, Lord Huntingtower; Burton Hall, Lord Monson; Casewick Hall, Sir J. Trollope,

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Bart.; Coleby Hall, Sir C. Tempest, Bart.; Glentworth Earl Scarborough; Grimsthorpe Castle, Lord Willoughby d'Eresby; Hainton Park, G. F. Heneage, Esq.; Harlaxton House, G. Gregory, Esq.; Haverholme Priory, Earl Winchelsea; Nocton Park, Earl Ripon; Normanby Hall, Sir R. Sheffield, Knt.; Redbourne, Duke of St Albans; Revesby Abbey, J. B. Stanhope, Esq.; Riseholme Palace, Bishop of Lincoln; Somerly Hall, Sir T. Beckett, Bart.; Stubton Hall, G. Nevile, Esq.; Thurby Hall, Sir E. G. Bromhead, Bart.; Uffington Hall, Earl Lindsey. When the Romans conquered Britain, Lincolnshire seems to have been occupied by the Coritavi, or Coritani, who are mentioned by Ptolemy as having *Lindum* and *Rhage* (Lincoln and Leicester) for their chief towns. After the subjugation of the county, Lincolnshire formed part of the province of *Flavia Cæsariensis*, a division the boundaries of which are given only on the questionable authority of Rufus Festus, but which seems to have comprised all the midland and eastern counties of England. Ermine Street, with its two branches, the Fossey and Upper Saltway, was the road by which the Romans kept up their communications through the province. The Upper Saltway communicated between the salt works of Worcestershire and the coast. *Lindum* (Lincoln), *Causennæ* (probably Ancaster), *Ad Abum* (probably near Winterton), were the principal Roman stations; and hypocausts, sarcophagi, urns, altars, coins, and tessellated pavements have been found as traces of the Roman occupancy. At Scampton, a Roman villa of very large size was traced in massive and well-preserved foundations. Two camps, undoubtedly Roman, existed at Gainsborough and Aukborough, with well-defined characteristics, as late as the beginning of the present century; and two others near Holbeach and Grantham are known, but their antiquity is not so certain. The Saxon province of Lindsey did not embrace the whole of Lincolnshire; but we find the Saxon *Lindo-Collyne* as the name of the capital, a word which easily slid into the *Nichol* of the Normans, when they gained possession of the county about the year 880. Lincolnshire after this formed part of the *Danelag*, or territory ceded to the Danes, and ultimately came under the Anglo-Saxon crown. In the civil wars the most memorable events are the siege of Lincoln (1141), and the insurrection of Sir Robert Wells against Edward IV. At the Reformation an attempt was made to resist the suppression of the monasteries, but it was soon defeated. In the parliamentary wars Lincolnshire was the scene of several actions. Charles I. captured Grantham in 1642; and the parliamentary forces were victorious at Grantham, Ancaster, Gainsborough, and Horncastle in that same year.

The antiquities of Lincolnshire are numerous. Almost all the churches are fine specimens of ancient architecture; and it is somewhat remarkable that the most beautiful edifices are to be found in the lowest and most fenny situations, when, at the time of their erection, the means of communication must have been very limited; yet, under these disadvantages, were built the churches of Boston, Pinchbeck, Spalding, Holbeach, and other places. The ecclesiastical buildings in the division of Lindsey, with the exception of Lincoln Cathedral, are generally inferior to those in Kesteven and Holland; but Barton-upon-Humber, in that division, contains one of the only two churches in England which are considered to be of undoubted Saxon origin.

The other most interesting antiquities, besides the Roman and other remains in Lincoln itself, are Crowland Abbey, which was founded in 716, and was formerly a place of great importance. Near it is the old triangular bridge, which is supposed to have been built about 860, and has been stated to be the oldest bridge in England. Torksey Castle, at the junction of the Foss Dyke with the Trent; Thornton Abbey, near the Humber, founded about

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the year 1139; Whykham Chapel, near Spalding, built about 1292; Bardney Abbey, on the banks of the Witham; Tattershall Castle, on the same river, erected about 1440; and Somerton Castle, in the parish of Boothby.

Sir Isaac Newton, Lord Burghley, Lord Bolingbroke, Stukely the antiquarian, Wesley the founder of Methodism, and Fox, the author of the *Book of Martyrs*, were, amongst many other eminent men, natives of this county.

LINDAU, a town of Bavaria, circle of Swabia, situate on three islands in Lake Constance, 100 miles W.S.W. of Munich. It is united with the mainland by a long wooden bridge. It was formerly fortified, but its ramparts have disappeared, and their place is now occupied by flower-gardens. The town contains a castle and four churches, and carries on a brisk trade in grain and wine with Switzerland and Italy. Steamers ply from its harbour to the other lake ports daily. The Romans under Tiberius are believed to have constructed a fortress here, and some remains of an ancient wall and tower are supposed to be a part of it. Pop. about 3500.

LINDSAY, or LYNSAY, SIR DAVID, a Scottish poet, descended from a younger branch of the family of Lord Lindsay of Byres, was the eldest son of Lindsay of Garmylton, in the county of Haddington, and of the Mount, in the county of Fife. He was born in Fife at some period before 1500, and, according to the ordinary opinion, studied at St Andrews from 1505 till at least 1508. How he was employed for several years after this period is uncertain; but in 1512 he became an attendant upon the infant prince, afterwards James V., and, according to Buchanan, in his *History*, was also "special servant" to the king. His wife, Janet Douglas, had for many years charge of the king's linen. In 1524 he was removed from his post, as an obstacle to the ambitious projects of the Earl of Arran, who had married the queen dowager. His pension, however, was continued. Impatient under his absence from court, he published in 1529 his *Complaynt*, in which he feelingly reminds the king of his gentle and devoted services to him when a child. No sooner had James secured, in 1530, the full regal power, than he conferred upon Lindsay the office of Lyon King-at-Arms, and soon afterwards the honour of knighthood. In his new capacity, he was sent with two others, in 1531, on an embassy to Charles V. touching the commerce between Scotland and the Netherlands. He was one of the ambassadors that bore proposals of marriage from the king, first in 1535, to a princess of the imperial family, and in the following year to a daughter of the Duke of Vendôme; but in both cases without success. James married Magdalene of France in July 1537; and in two months after Lindsay wrote his poem entitled, *The Deplo-ration of the Deith of Quene Magdalene*. After the king's death in 1542 he supported the regency of the Earl of Arran as long as it was favourable to church reformation. In 1543, and the two succeeding years, he represented in parliament the burgh of Cupar; and in 1544 he was sent on an embassy to the emperor to deliver the insignia and the statutes of the order of the Golden Fleece, which had been conferred on the late king. Four years afterwards he was an ambassador at Copenhagen. At an early stage of his career Lindsay had incurred the hatred of the priesthood, by lashing with his piquant satire their avarice, profligacy, licentiousness, and absurd religious ceremonies, but had been shielded from their persecution by the favour of James V. Soon after the murder of Cardinal Beaton in 1544, he was forced to take refuge, along with other reformers, in the castle of St Andrews; and, in 1547, was one of those who urged Knox to receive ordination. In 1548, by his mission to Denmark, he secured free trade in grain with that country for Scottish merchants. He is supposed to have passed his latter years in retirement, and to have died at some period between 1555 and 1558.

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A poet, in the highest sense of the term, Lindsay certainly was not. His claim to notice is chiefly derived from his stinging satire, and his intrepid exposure of ecclesiastical disorders, the two weapons that he wielded so effectively in the battle of the Reformation. His vivacity, his manly common sense, and his true and humorous delineations of manners, long rendered him a favourite with his countrymen. His paintings, however, of the vices of that age are too minute, and too severely faithful to suit the taste of the present day. Amid much inelegance and pedantry, he displays occasional taste, and a fair acquaintance with history, divinity, and Latin literature.

His largest poem, *The Monarchie, ane Dialog betwix Experience and ane Courteour*, seems to have been the work of his advanced age, and is little else than a compendium of universal history, forming the basis, however, of many acute generalizations. A translation of it into Latin prose, by Andrew Robertson, was, in 1591, re-translated into Danish verse by Jacob Mattsön. His *Dreme*, supposed to be his earliest poem, is characterized by Warton as evincing strong talents for high description and rich imagery. In his *Complaynt* there is a lively and faithful sketch of the author's own fortunes, of the manners of the age, and of the gradual corruption of James V., by the designs and vicious example of his courtiers. More amusing and satirical is his *Supplication directit to the Kingis Grace, in contemplation of Side Taillis*; in which, after an unscrupulous exposure of the absurdities of the over-long skirts of the ladies, he concludes that they are the offspring of pride, the parent of all evil. *Kittis Confession*, a satire upon auricular confession, is characterized alike by good sense and severe pungency. A more poisoned weapon, his *Testament and Complaynt of our Sovereign Lordis Papingo* (or Parrot), was aimed at both courtiers and clergy. His *Tragedie of the Cardinall Beaton* is deficient in elegance and vigour. The mock-heroic tilt of two rival leeches of the king's household is cleverly described in his *Justing betwix Watson and Barbour*. In spite of its offences against good taste and decency, the *Historie of Squyer Meldrum* is, perhaps, the most amusing of all his works. The Squire, a contemporary of the author, combines the character of a hero of classical antiquity with that of the hero of more modern romance; but his adventures, though facetiously enough described, bear too strong a similarity to the real events on which they are founded, to be romantic. The most elaborate, however, of all his productions, is the *Satyre of the Thrie Estaitis*, the earliest specimen now extant of the genuine Scottish drama. A moral play, rather than a regular drama, it contains real characters, who mingle freely with impersonations of virtues and vices. Its merciless blows are dealt indiscriminately against the monarch, the nobility, and especially the clergy; a severity, however, which did not prevent it from being represented before the king and his court at Cupar, about 1535, and at Linlithgow about 1539. Its mixture of piety with gross obscenity is almost unexampled.

Besides his poetical works, he left two treatises on Heraldry, the one still in manuscript, and the other a curious collection of blazonings, lately published. The MSS. of these are preserved in the Advocates' Library. Bale, in his *Scriptores Britannia*, attributes to him the *Acta sui Temporis*; and Mackenzie affirms that he was the author of a History of Scotland. There is no sufficient ground for believing, with Dr Leyden, that Lindsay wrote the *Complaynt of Scotland*.

The latest edition of Sir David Lindsay's poems was published, with a life, prefatory dissertation, and glossary, by George Chalmers, London, 1806, 3 vols. 8vo. The chief authorities for the Life of Lindsay are, Lord Lindsay's *Lives of the Lindsays*, and Irving's *Lives of Scottish Poets*.

LINDSEY, REV. THEOPHILUS, an able Socinian writer,

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was born in Middlewich, Cheshire, on the 20th June 1723. He was educated at St John's College, Cambridge, where he took degrees, and afterwards obtained a fellowship. After travelling for two years on the Continent with the son of the Duke of Somerset, he was presented in 1753 to the living of Kirkby Wiske, in Yorkshire; and after exchanging it for that of Piddletown, in Dorsetshire, he removed to Catterick, in Yorkshire, where he remained for several years. He began to entertain Anti-Trinitarian views, which were confirmed in 1769 by his intimacy with Dr Priestley and the Rev. William Turner. In 1772 he took great interest in the debate in parliament on a bill to relieve scrupulous persons from subscribing the Thirty-nine Articles; but as the movement failed, he found it necessary to leave the Established Church, although at great personal sacrifice. From 1774 till 1778 he preached in a room in Essex Street, Strand, and afterwards removed to a chapel built for him in the same street. Here he continued to labour till 1793, when old age compelled him to leave the charge of his flock in the hands of Dr Disney, a sufferer in the same cause with himself, who had left the Establishment and become his colleague. Lindsey died 3d November 1808, in the eighty-sixth year of his age. His chief work is, *An Historical View of the State of the Unitarian Doctrine and Worship from the Reformation to our own times*, 8vo, Lond. 1783. His life was written by Thomas Belsham, 8vo, Lond. 1812.

LINDUS (modern *Lindo*), an ancient Dorian town on the E. coast of Rhodes, near a promontory of the same name. It is mentioned by Homer, along with the two other Dorian cities, Ialysus and Camirus, as allied to the Greeks in the Trojan War. After the building of Rhodes (408 B.C.), Lindus soon lost both its population and independent position. It continued famous, however, for the *Lindia*, or temple of Minerva, and the temple of Hercules. The former, of which the ruins may still be seen, was built by the daughters of Danaus, or, according to others, by Danaus himself. The inscriptions found on the tombs, and other architectural vestiges, are described in Hamilton's *Researches*, vol. ii., p. 55. Lindus was the birthplace of Cleobulus, one of the Seven Sages. The district around it, though sterile, was noted in ancient times for wine and figs. See RHODES.

LINEN, a woven fabric prepared from the spun thread of flax (*Linum usitatissimum*), the cultivation of which is noticed under AGRICULTURE, and HEMP; the method of bleaching it is noticed under BLEACHING; and of imparting colour to it, under DYEING. In the present article we propose to notice briefly the modes of preparing linen thread, referring to our general article on WEAVING for an account of the textile fabric.

As soon as the flax has been pulled, it is usual to separate the linseed from the stalk by the process of *rippling*; the ripple consisting of a row of iron teeth about 18 inches long, firmly fixed in a bench or plank: on drawing the stalks briskly through the ripple, the seed bolls are quickly separated. The next process is *retting*, or steeping in water, in order to separate the woody portion of the stalk, or *boon*, from the filamentous portion, which is the flax. The common method of doing this is in pools or pits filled with water, as noticed in one of the previous articles referred to; but it is now done more quickly and economically by means of steam, which effects in about 60 hours that which, under the old process, requires from 10 days to 3 or 6 weeks. Under the new process the flax is steeped in large circular vats, furnished with steam-pipes. The flax is held down in the vats by strong cross-bars of wood; water is then let in

from time to time, until the flax ceases to absorb it. Steam is then made to circulate through the steam-pipe at the bottom of the vat, so as to raise the water to about 90 degrees, and maintain it at that temperature. In the course of a few hours the acetous fermentation has set in, and the resinous or gummy matter, which binds the parts of the stalk together, becomes decomposed, and the decomposition is completed in about 60 hours. The water is then drawn off, and the flax is removed to be dried either in the open air, or in a drying chamber, artificially heated. Improved methods of retting flax, by means of alkaline solutions, with the assistance of pressing rollers and vacuum vessels, have been patented.

The woody portion of the straw, being thus loosened from the filaments, is separated by the processes of *breaking* and *scutching*.

The *break* is a machine consisting of two rows of iron grooves, one fixed to a frame, and the other falling down upon it, in such a way that the convex part of the upper row of grooves falls into the concave part of the under row, and bruises the wood without injuring the fibre. The upper row of grooves is brought down by the action of a treadle, and is raised by means of a spring. The operator passes the flax between these grooves, so as to bruise the boon, and enable it to separate easily under the blade of the scutching-knife, which is a broad wooden blade held in the right hand, while with the left a handful of bruised flax straw is introduced into a groove in a wooden stand, and so beaten with the scutch-blade as to strike away the bits of woody matter. These operations are often performed by machinery, in which rollers are employed to crack the boon, and rotating knives attached to the face of a vertical wheel to separate the woody particles. Mr MacAdams' machinery is on this plan.¹ Mr Plummer, of Newcastle-on-Tyne, has patented a number of machines for the preparation of flax. In his flax-breaking machine the flutes on contiguous rollers are not quite in contact, so that the flax straw in passing between them is not damaged. It is the opinion of this patentee, that in the usual method of scutching and preparing flax for the spinning-mill, the principle has been to attain fineness by reducing and destroying the character of the fibre, rather than supporting the fibre, while undergoing the operation of cleaning. Instead, therefore, of the rigid tools to which flax is usually submitted, brushes of whalebone, bristles, or other suitable materials of various degrees of fineness, are used in most of the preparatory processes. In the rotary disk scutching-mill, an attempt is made to imitate the process of hand-scutching, by passing the flax between a series of disks covered with brushes instead of knives or blades. The flax, while being scutched, is held in a mechanical holder instead of in the hand.

The flax thus freed from its woody particles, is made up into bundles of 16 or 24 lb., the former being termed the *English*, and the latter the *Scotch stone*. The great markets for supplying the spinning trade of the three kingdoms are Leeds, Belfast, and Dundee. The length of the staple in flax may vary from 26 to 30 or 36 inches, and the fibre is of different degrees of fineness in its different parts, that near the root being coarse and strong, the middle portion fine and strong, and the upper part fine, but not so strong. Hence the first operation on the flax in the flax-mill is to divide the lengths into three parts, which are kept separate, and furnish different qualities of thread. The division is made not by cutting, but by tearing the filaments asunder, so as to leave loose ends, which, in spinning, would combine with other similar ends placed upon them. The machine for dividing the flax consists of holding or friction-wheels which move slowly, and hold the flax, while a centre wheel,

Linen.

¹ Mr MacAdam is Secretary to the Society for the Promotion and Improvement of the Growth of Flax in Ireland. He is the author of an essay "On the Cultivation of Flax," which gained the prize offered by the Royal Agricultural Society of England. The essay is inserted in the 8th vol. of the Society's *Journal*.

Linen. furnished with oval projections on its periphery, tears the fibres asunder. With flax of long staple, four or five divisions may be made instead of three.

The heaps or *stricks* of flax thus formed are cleaned, split, separated into fibres in parallel order, while the short fibre or tow is separated by the process of *heckling*. The *heckle* or *hackle* is a sort of comb with iron or steel teeth, very sharp at the points, arranged on a block of wood. Heckles are of various degrees of fineness; and, in some cases, the teeth being set close together, a heckle may contain more than a 1000, arranged in parallel rows. By throwing the flax upon these teeth, and drawing it out, the tow is combed out, and the long fibre or *line*, as it is called, remains; 100 lb. of well-cleaned flax yielding from 45 lb. to 60 lb. of line; the rest being tow, boony particles, and dust. In some cases, between the first and second hecklings, the flax is folded up in a bundle and beaten on a block with a wooden mallet, after which it is well rubbed in the hands. Heckling is also commonly performed by machinery, for which purpose the lengths of flax of 10 or 12 inches are spread out and fixed in an iron vice or holder; a number of these holders are hung on to a circular frame, within which revolves a drum covered with sharp heckling teeth, the outer frame revolving more slowly in the contrary direction, and depositing the holders upon a rail after they have passed through about half a circle. The holders are then turned the other way, so that the other portion of the fibres may be heckled. After this the holders are opened, the flax is inverted, and again passed through the machine. Mr Plummer has several improved heckling machines, both for cut flax and for long flax; he objecting to the plan of cutting up the flax into lengths, and maintaining that if a long and generous fibre be treated with gentleness instead of harshness, considerable saving may be effected. In the double heckling machines both sides of the flax are brushed before it meets with the heckling points or pins, by which means crossed or entangled fibres are got rid of.

The next operation in the mill is *sorting* the heckled flax or line, so as to separate the stricks into various degrees of fineness, which is done as much by the touch as by the eye, while the fibres are frequently drawn through a block-heckle to keep them parallel. The sorted line is placed in certain boxes or divisions marked respectively—2 lb., 3 lb., 3½ lb., 4 lb., 5 lb., 5½ lb., 6½ lb., and so on; from an old method of comparing fineness and weight.

The sorted line is now subjected to the operations of *spreading*, *drawing*, and *roving*, whereby it is converted into ribbons or *slivers*. It is spread upon a feeding-cloth, in such a way that the ends of the second strick reach the middle of the first; by which means a uniform thickness is maintained, the heckle-stricks being thicker in the middle than at the ends. The feeding-cloth delivers the flax to a pair of rollers, and these pass it on through gills or heckling-points to a second pair, which, moving at greater speed, increase the length and diminish the thickness of the line, so as to convert it into a flat narrow sliver or ribbon, which is received by a tin can. This being full, it is taken to a drawing or spreading frame, where a number of slivers are united and drawn into one length. This drawing is as important for flax as for cotton, and is sometimes repeated three or four times, increasing the number of drawings each time. After this the drawings pass through a roving-frame, where they are slightly twisted, and are then wound upon bobbins preparatory to spinning. The spinning-wheel has, during many years, been superseded for flax as well as for cotton; and the machinery employed for the one resembles that used for the other; only as the fibres of flax do not so readily unite as those of cotton, it is necessary for fine work to moisten them, so as to make them more pliable and easy to spin. The water usually employed is raised to the temperature of about 120°.

and is contained in a trough, which extends the whole length of the throstle or spinning-frame.

The fineness of the yarn thus formed is estimated by the number of leas to the pound weight, the lea consisting of 300 yards. Less than twenty years ago, the fineness of machine-spun linen yarn was stated at 150 leas to the pound. Of late years, from 200 to 240 leas line has been spun. It is used in the manufacture of Irish lawns and coarse cambrics; but for fine work, such as the lawns and handkerchiefs of Cambrai and Valenciennes, hand-spun yarns are preferred; some of which, as shown in the Great Exhibition, particularly those exhibited by Messrs Berthelot and Bonté, of Cambrai, are, to use the words of the Jury Report "surprisingly fine, perfect, and beautiful; being up to 1200's warp, and 1600's weft yarn; and are certainly equal, if not superior, to anything of the kind hitherto produced."

It has been already noticed that the various qualities of line are sorted into 2 lb., 3 lb., 3½ lb., and so on. A bundle of linen yarn, consisting of 20 hanks, of 10 leas each, or 60,000 yards, is sometimes named by the number of leas to the pound, or by its weight, thus: a bundle of 25 leas per pound weighs 8 lb.; a bundle of 50 leas per pound weighs 4 lb.; one of 100 leas per pound weighs 2 lb.; so that 8 lb., 4 lb., and 2 lb. correspond in size with 25 leas, 50 leas, and 100 leas. Now, in sorting, a certain quantity of line will spin to a certain size or weight per bundle; and it was long usual with the line sorters, to name certain qualities as 2 lb., 3 lb., 3½ lb., &c.; because that quality of line would spin to that weight per bundle. Line sorters still retain the same standard and name, although, from various improvements in the trade, much finer line can be spun from the same weight than formerly.

Linen thread is made by doubling the yarn, and after bleaching, it is formed into balls or reels.

The foreign trade in the linen manufacture is considerable. Our exports of linen yarn for the years 1853, 1854, 1855, were,—22,893,566 lb., 17,696,567 lb., and 17,872,950 lb., respectively; of which the declared values were,—L.1,154,977, L.944,502, and L.916,429. The value of linen thread exported during the same years was,—L.388,374, L.315,685, and L.293,819; while the exports of linen, entered by the yard, exclusive of lace of thread, during the same years, were respectively,—134,165,291 yds., 111,648,657 yds., 118,247,498 yds.; of the declared values of L.4,345,600, L.3,763,107, and L.3,803,487. During the same years the exports of lace of thread were,—578,623 yds., 292,563 yds., and 218,508 yds.; of the respective values of L.8267, L.7296, and L.4451. Among the imports the most considerable are cambrics and French lawns, which previously to the 11th June 1853 were entered by the piece, but since that date by the square yard. During the years 1854, 1855, there were imported 146,454 square yards, and 154,966 square yards. In 1855 there were imported,—of damasks and damask-diaper, 8219 square yards; of plain linen and diaper, and manufactures not enumerated, and not made up, to the value of L.21,262; while among articles made up, the chief article is cambric handkerchiefs, of which 45,471 were imported. Of the raw material imported in the year 1855, we have—of dressed flax, 14,568 cwts.; undressed, 1,131,475 cwts.; and of tow, or codilla of flax, 147,392 cwts.

During the Great Exhibition of 1851, the attention of the Jury, Class XIV., was attracted by manufactures in China grass; and it was remarked that, in the coarse kinds of cloth made from it, the fibre appeared to be split into lengths which were attached to each other at the smaller ends. There were also some beautiful handkerchiefs and other fine linens made from this material. It is sometimes used for making coloured fabrics, combined with other substances, such as silk and cotton; and the peculiar brilliancy of its fibre allows it to be used in this way to advantage. (C: T)

Linen.

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Lingen.

LINGARD, REV. JOHN, D.D. and LL.D., the Roman Catholic historian of England, was born at Winchester, 5th February 1771. His parents, who were in humble circumstances, belonged to the Church of Rome, and it was chiefly due to the notice taken of him by Dr Milner, that he was sent to study at Douay, in France. He continued to reside here till the revolutionary troubles dispersed the students; and after several changes he came with the staff of the college to settle at Ushaw, near Durham. His first publication was made in 1805, and consisted of a series of letters, written for the Newcastle *Courant*, and collected under the title of *Catholic Loyalty Vindicated*. He was soon afterwards engaged in an attack on Bishop Huntingford, Bishop Tomlin, and Lord Kenyon, in regard to opinions which they had published on the Catholic question, as it was called; and as his strictures called forth antagonists of inferior name, Lingard's replies multiplied into a volume, which was given to the world in 1813, with the title, *A Review of certain Anti-Catholic Publications*. Previously, however, to the collection of these detached pamphlets, he had published (in 1812), *Documents to ascertain the sentiments of British Catholics in former Ages, in regard to the Power of the Popes; Strictures on Doctor Marsh's Comparative View of the Churches of England and Rome in 1815; and Catechetical Instructions on the Doctrines and Worship of the Catholic Church*. His *History and Antiquities of the Anglo-Saxon Church*, a work on which great part of Dr Lingard's fame will rest, was published in one volume in 1806; but in subsequent editions it has been enlarged to two volumes. His English translation of the New Testament was published anonymously in 1836.

But Dr Lingard's greatest work is the *History of England, from the first Invasion by the Romans to the Accession of William and Mary in 1688*. It was first published in 6 volumes 4to, in 1819-25, and has since passed through many editions, and been translated into several languages. The research displayed in this work, the remarkable impartiality on all controverted subjects, except that of his religion, the ease and spirited grace of the composition, the picturesqueness and graphic power of many of his descriptions, and the fresh materials dug out of regions previously unexplored, render this history an instructive and fascinating work. That it is a party history of very high merit, exhausts all that can with justice be said of it either in praise or blame. The author, of course, condemns Anne Boleyn, and defends Queen Katherine; and he instinctively prefers Bonner to Cranmer, and the short reign of Mary to the long annals of Elizabeth's power. In respect of civil and religious liberty, he is, with all his learning and research and genius, little better than a monk of the middle ages. All this, however, constitutes the peculiar value of his work, as furnishing one of a set of forces destined, each in its own place, to affect the resultant of public opinion. In the *Edinburgh Review* (vols. 42 and 44), two papers written by Dr John Allen, preferred a charge of untruthfulness against Dr Lingard, especially in regard to his quotations, which the reviewer held to be garbled for party purposes. This called forth a *Vindication* from Dr Lingard in 1826, and since that time there has been a much more favourable estimate of his merits even in the pages of that journal (vol. 53).

When his *History of England* was published, Dr Lingard visited Rome, and Pope Leo XII. proposed to make him a cardinal, but Dr Lingard declined the honour. He had a pension of £300 a-year from Her Majesty during the closing years of his life, in acknowledgment of his literary talent. He died at Hornby, near Lancaster, on the 13th of July 1851, and bequeathed his library to St Cuthbert's College, at Ushaw, near Durham.

LINGEN, or LINGA, an island of the Malay Archipelago, on the equator, off the N.E. coast of Sumatra, E. Long. 104. 40. It is about 40 miles in length by 20 miles in

breadth. There is a curious mountain in the centre of the island, termed "The Ass's Ears," from the two peaks at the S.W. end. The coast is flat, stretching inland for some miles. Some gold and tin are to be found. The principal products are sago, pepper, farinaceous roots, fruits, and vegetables. The inhabitants are said to be Malays of the purest type, and they are governed by a sultan, whose court is at Rovwala Dai. Pop. 10,000.

LINKÖPING, an ancient town and bishop's see of Sweden, capital of a cognominal län, on the Stänga, 2 miles S. of its junction with Lake Roxen, and 108 miles S.W. of Stockholm. Its streets are rather irregular, but the houses are well built. The chief public buildings are,—the Gothic cathedral, the third in importance in Sweden; and the college, to which are attached a library containing upwards of 30,000 volumes, and a museum of natural history, archæology, and coins. The chief manufactures are stockings and tobacco. Near the bridge which here spans the river the famous battle of Stångebro was fought on the 25th September 1596, between Sigismund and his uncle, afterwards Charles IX. of Sweden, when the latter was victorious. Pop. about 4000.

LINKÖPINGS LÄN, of which the above town is capital, lies between Lake Wetter on the W., and the Baltic on the E., and contains an area of 4254 square miles, with (in 1850) 222,484 inhabitants. The Gota and Motala canals traverse it from the Wetter to the Baltic, and communicate with the many lakes of the district. Its chief products are,—grain, flax, hops, timber, iron, and lead. Linköping and Norrköpping are the two chief towns.

LINLITHGOW, a town of Scotland, capital of the county of that name, and once a place of some commercial importance, its merchants formerly dealing extensively in Baltic produce, is pleasantly situated in the vicinity of a beautiful lake, 16 miles from Edinburgh, and 31 E. from Glasgow. It consists chiefly of a single street, running E. and W. along the S. bank of the lake, containing many substantial though old houses, and is gradually improving in appearance, in consequence of the increasing number of modern buildings. The place from which Hamilton of Bothwellhaugh shot the Regent Murray is still pointed out. The name is supposed to signify "the valley of the flowing lake," from the circumstance, it is believed, that the supply of water is chiefly derived from springs flowing from its bed. It is a very ancient town, having been erected into a royal burgh by David I. The oldest charter extant, however, is in 1389 by King Robert II. It possesses the ruins of a fine old palace, the birth-place of Queen Mary, and a favourite residence of the Scottish monarchs, built at different periods, on the site of a castle erected by Edward I. of England (who with his army wintered at Linlithgow in 1301), and which was destroyed by fire in 1746. It has also a very ancient church, in the decorated Gothic style, said to have been founded by David I., but little of the original structure now remains. In its south transept appeared the vision of St John, a probable device of his nobles to dissuade James IV. from his intended war with England, as described by Pittcottie. There are four Protestant places of worship unconnected with the Established church, besides a Roman Catholic place of worship. The old fountains are objects of much curiosity. The town has a dull appearance, but the inhabitants are by no means inactive, having a considerable trade in tanning, gluemaking, and shoemaking; besides which, paper-manufacturing, calico-printing, and distillation are carried on on a large scale. It is also surrounded by extensive fields of coal and iron, and is in consequence increasing in importance. The Edinburgh and Glasgow Railway and Union Canal intersect the burgh. There is a weekly grain stock market held on Friday. The population in 1851 amounted to 4213, and the parliamentary constituency in 1856 to 124. Linlithgow

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along with the burghs of Airdrie, Falkirk, Hamilton, and Lanark, returns one member to parliament.

LINLITHGOWSHIRE, or WEST LOTHIAN, a county in Scotland, having the Firth of Forth on the N., Edinburghshire, or Mid-Lothian, on the E. and S.E., Lanarkshire on the S.W., and Stirlingshire on the W., is situate between N. Lat. 55. 49. and 56. 1., and W. Long. 3. 18. and 3. 51. It is of a triangular form, about 19 miles long on its eastern boundary, and 13 on its western; but at a medium it is only about 7 miles broad, and 16 long. It contains 79,995 imperial acres, or about 125 square miles.

The surface of this county generally is either level or serrated into gently undulating ridges, running from E. to W., and separated from each other by a succession of irregular miniature valleys. Towards the W. and S.W. the ground rises into a succession of hills, the most elevated peak of which, Cairnpapple, in the parish of Torphichen, is about 1000 feet above the level of the sea. The county is in general beautifully wooded, and the trees have reached a large size.

The climate, though variable, is not severe, and the neighbourhood of Linlithgow is considered to be remarkably salubrious. The prevailing winds, which blow for about two-thirds of the year, are from the S.W. According to a register of the weather kept at Duddingston, on the coast of the Firth of Forth, about the middle of the northern boundary, the greatest number of rainy and snowy days in one year, for a period of thirty years, from 1778 to 1808, was 111 (in 1780), and the smallest number 22 (in 1803), but the days on which slight showers fell are not included. The quantity of rain, however, that falls in this county exceeds somewhat that in Mid-Lothian, and amounts to a fourth part more than the fall in East-Lothian, which, in an agricultural point of view, is not considered as disadvantageous.

Though there is a great variety of soil in this district, and considerable tracts of gravel and sand, yet clay is the most general. Upwards of four-fifths of the soil is arable, and capable of producing every description of crop cultivated in Scotland. The best land is situate to the N. and E., along the shores of the Firth of Forth; and the worst is found on the high table-lands in the parishes of Whitburn and Torphichen, being in an opposite direction. The high grounds, from the prevalence of mountain limestone, afford excellent pastures, and are generally adorned with thriving plantations. A considerable quantity of moor still exists in the upland parishes, but much has of late been reclaimed.

The only streams of note are,—the Almond, which rises on the border of Lanarkshire, and flows N.E. for about 24 miles between this county and Edinburghshire; and the Avon, which forms the western boundary for about 12 miles. Both these fall into the Firth of Forth. On the N. side of the town of Linlithgow there is a lake about a mile long, and half-a-mile broad, occupying about 150 acres, and abounding with pike and eels. In the parishes of Linlithgow, Ecclesmachan, and Abercorn, there are several sulphurous springs, and a strong chalybeate is found in the parish of Torphichen; but none of them are resorted to.

Argentiferous galena was at one time got in the Cairnpapple ridge, in the parish of Linlithgow; and in the neighbourhood of that town a small vein of that ore was found several years ago in a limestone quarry. Limestone is wrought in the high grounds to the S.W. of the town of Linlithgow, and at Hopetoun, near Queensferry. Sandstone, in some places of an excellent quality, prevails along the coast of the Forth, and in the interior there are whinstone and basalt. At Binny, in the parish of Linlithgow, is found the celebrated freestone which has been used in the erection of the Royal Institution, National Gallery, and a considerable part of the chief public buildings in Edinburgh and Glasgow. On Dundas Hill there is a basaltic rock 250

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yards in length, and about 60 feet in height, with an almost perpendicular front, consisting of a fine texture. Coal has been wrought in the county of Linlithgow for five centuries past, and it is supposed that supplies of that article were obtained at Bonnytown Hill, near Linlithgow, in the time of the Romans. In the vicinity of Borrowstounness coal has long been wrought to a great extent; and within the last fifteen years the discovery of large fields of common and blackband ironstone, together with the increased facilities of transit, has contributed greatly to the development of the mineral wealth of the county in that quarter. In the neighbourhood of Bathgate is found the celebrated Torbanehill and Boghead gas coal or Bitumenite; and extensive mineral fields have, more recently, been discovered there also. The following is a statement, from the valuation-roll of the county for 1856-7, of the rents and lordships realized for minerals:—

1. In Bathgate parish	L.4480	10	0
2. „ Borrowstounness	6542	7	4
3. „ Carriden	6121	3	10
4. „ Ecclesmachan	170	18	0
5. „ Torphichen	489	17	6
6. „ Whitburn	3667	13	4
7. „ Uphall	160	9	9

Total.....L.21,632 19 9

Smelting furnaces on an extensive scale have been erected at Kinniel, in the lower, and at Crofthead, in the upper, part of the county; and at Bathgate paraffine oil is extracted in great quantities from the Bitumenite. The principal collieries now in operation are,—Colinshiel, Grange, Kinniel, Barbauchlaw, Polkemmet, Coustoun, and Benhar.

The valued rent of the county, taken in 1649, was L.75,027, 12s. 2d. Scots. In 1806 the real rent was L.64,518, 18s. 7d. sterling; in 1811 the real rent of land, mines, and houses, was L.88,745, 10s.; in 1844 the real rent was L.114,822, 17s. 6d.; and, in 1856, including railways and canals, it amounted to L.156,792, 12s. 8d. The rental of the county has thus become more than doubled in the course of fifty years.

The principal mansion-houses are,—Hopetoun House, Earl of Hopetoun; Dalmeny Park, Earl of Rosebery; Kinniel House, Duke of Hamilton; Dundas Castle, Mr Dundas of Dundas; Craigie Hall, Mr Hope Vere; Polkemmet House, Sir William Baillie, Bart.; Wallhouse, Mr Gillon; Preston, Mr Seton; Avontoun, Mr Blair; and Newliston, Mr Hog.

The arable land is divided into farms of from 100 to 400 imperial acres, and the rent per acre of these varies from 30s. to 60s. The average rent of the county in 1811 was rather more than 23s. per imperial acre; and in 1856, after deducting the value of mines, canals and railways, and inhabited houses, it was found to be more than 27s. 6d. per acre. The leases of the arable land are almost invariably for nineteen years; and grass lands are usually let annually by public roup, although in some instances they are taken for a period of three or five years. The system of farming is not inferior to that pursued in the best cultivated districts, and is principally in the four or six year course rotation; but many of the minor farmers have large dairies, and find a ready market for their produce amongst the rapidly increasing mining population of the county.

The following are the agricultural statistics of Linlithgowshire for 1856:—Number of occupants, 458; total acreage under a rotation of crops, 52,511;—wheat, 4643; barley, 3789; oats, 12,520; rye, 2; bere, 51; beans, 1776; pease, 2; vetches or tares, 509; turnips, 5142; potatoes, 2044; mangold, 45; carrots, 13; cabbage, 12; flax, 105; turnip seed, 59; any other grain or root crop, 53; bare or summer fallow, 340; grass and hay under rotation, 21,400. Horses for agricultural purposes above 3 years old, 1659; ditto under 3 years old, 467; other horses, 452; milk cows, 3446; other cattle, 6103; calves, 1797; sheep for

Linnæus. breeding, 4471; ditto for feeding, 7229; lambs, 4813; swine, 1494.

There are two royal burghs in the county—Linlithgow and Queensferry; and, besides the towns of Bathgate and Borrowstounness, which are increasing rapidly in population, there are a number of thriving villages. The county is divided into thirteen parishes, and contains also a portion of the parish of Cramond, which is chiefly in the county of Edinburgh. These parishes, with two in Mid-Lothian, and four in Stirlingshire, form the Presbytery of Linlithgow. It sends one member to parliament, and the constituency, in 1856, amounted to 427. It is united with the counties of Berwick, Haddington, and Peebles, in furnishing a regiment of militia artillery.

The county is intersected by several lines of railways,—the Edinburgh and Glasgow Railway, one of the trunk lines, passing through it from E. to W. for a distance of about 10 miles. The Edinburgh and Bathgate connects the port of Leith and the extensive mineral fields in the south of the county and Lanarkshire; and the Wilsontown and Morning-side, and several others, complete the connection with the mineral fields of the west. By the Monkland, Slamannan, and Borrowstounness railways, a large amount of coal and iron is brought for shipment at that town (which is rapidly rising in importance as a shipping port), and a considerable portion of the produce of the Kinniel iron-works are transported to Glasgow. The Edinburgh and Glasgow Union Canal traverses from 10 to 11 miles of the county, upon which there is a large traffic in manure, coal, and freestone.

The site of the Roman wall, which extended from the Forth to the Clyde, usually styled "Grahame's Dyke," is still pointed out in the parishes of Borrowstounness and Carriden. In the latter parish there is a farm establishment which still bears the name of "Walltown;" and in the former the Duke of Hamilton's fine estate is denominated "Kinniel," or "the head of the wall." The remains of a stone barrow exists near Kippe, about 3 miles to the S. of Linlithgow. A preceptory, which originally belonged to the Knights-Templars, and afterwards to the Order of St John of Jerusalem, is to be seen at Torphichen, and a portion of it is used as the parish church. The parish churches of Dalmeny, Abercorn, Kirkliston, Uphall, and the burgh church of South Queensferry, are also of great antiquity. Pop. (1831) 23,291, (1841) 26,872, (1851) 30,044.

LINNÆUS, or LINNÉ, SIR CHARLES, a celebrated botanist and natural historian, was born on the 24th of May 1707, in a village called Roshult, in Smaland, where his father, Nicholas Linné or Linnæus, was then vicar, but afterwards preferred to the curacy of Stenbrohult. It is said, that on the farm where Linnæus was born there yet stands a large lime tree, from which his ancestors took the surnames of *Tiliander*, *Lindelius*, and *Linnæus*.

It seems probable that Linnæus' taste for the study of nature was formed from the example of his father, who, as he has himself informed us, cultivated, as his first amusement, a garden plentifully stored with plants. Young Linnæus soon became acquainted with these, as well as with the indigenous plants of his neighbourhood. Yet, from the smallness of his father's income, the young naturalist was on the point of being destined to a mechanical employment; fortunately, however, this design was overruled. In 1717 he was sent to school at Wexio, where, as his opportunities were enlarged, his progress in all his favourite pursuits was proportionally extended. At this early period he paid attention to other branches of natural history, particularly to the study of entomology.

The first part of his academical education Linnæus received at Lund, in Sweden, under Professor Stobæus, who favoured his inclination for the study of natural history. After a residence of about a year, he removed in 1728 to

Uppsala. Here he soon contracted a close friendship with *Linnæus.* Artedi, a native of the province of Angermania, who had already been four years a student in that university, and, like himself, had a strong bent to the study of natural history in general, but particularly to that of ichthyology. Soon after his residence at Uppsala, our author was likewise fortunate enough to obtain the favour of several gentlemen of established character in literature. He was in a particular manner encouraged in the pursuit of his studies by the patronage of Dr Olaus Celsius, at that time professor of divinity, and the restorer of natural history in Sweden; who, being struck with the diligence of Linnæus in describing the plants of the garden at Uppsala, and his extensive knowledge of their names, not only patronized him in a general way, but admitted him to his house, his table, and his library. After a residence of only two years at Uppsala, he was thought sufficiently qualified to give lectures occasionally from the botanic chair, in the room of Professor Rudbeck.

In the year 1731, the Royal Academy of Sciences at Uppsala, having for some time meditated the design of improving the natural history of Sweden, at the instance particularly of Professors Celsius and Rudbeck, deputed Linnæus to make the tour of Lapland, with the view of exploring the natural history of that arctic region; an undertaking to which his reputation, already high as a naturalist, and the strength of his constitution, equally recommended him. He left Uppsala on the 13th of May, and took his route to Gevalia or Gevels, the principal town of Gesticria, forty-five miles distant from Uppsala. Thence he travelled through Helsingland into Medelpad, where he made an excursion, and ascended a remarkable mountain on his way to Hudwicksvald, the chief town of Helsingland. He then proceeded through Angermanland to Hernosand, a seaport on the Bothnian Gulf, seventy miles distant from Hudwicksvald; and, as the spring was not sufficiently advanced, he took this opportunity of visiting, though at the hazard of his life, the remarkable caverns on the summit of Mount Skula.

When Linnæus arrived at Umcea, in West Bothnia, about ninety-six miles from Hernosand, he quitted the public road, and took his course through the woods westward, in order first to traverse the southern parts of Lapland. Having now reached the country that was more particularly the object of his inquiries, being equally a stranger to the language and to the manners of the people, and without any associate, he committed himself to the unfailing hospitality of the inhabitants. In this excursion he reached the mountains towards Norway; and after encountering great hardships, returned into West Bothnia. He next visited Pithœa and Lulea, upon the Gulf of Bothnia; from which latter place he again took a westerly route, proceeding up the river of that name, and visited the ruins of the temple of Jockmock in Lulea Lapland, or Lap Mark; he thence traversed what is called the *Lapland Desert*, destitute of all villages, cultivation, roads, or any conveniences, and inhabited only by a few straggling people, originally descended from the Finlanders, a people entirely distinct from the Laplanders. In this district he ascended a noted mountain called Wallovär, in speaking of which he has given us a pleasant relation of his finding a singular and beautiful new plant (*Andromeda tetragona*) when travelling within the arctic circle, with the sun in his view at midnight, in search of a Lapland hut. Thence he crossed the Lapland Alps into Finmark, and traversed the shores of the North Sea as far as Sallero.

These journeys from Lulea and Pithœa, on the Bothnian Gulf, to the north shore, he performed on foot, attended by two Laplanders, one his interpreter, and the other his guide. He tells us that the vigour and strength of these two men, both old, and sufficiently loaded with his baggage, excited his admiration, since they appeared quite unfatigued by their labour; whilst he himself, although young and robust,

Linnæus. was frequently quite exhausted. In this journey he was wont to sleep under the boat with which they forded the rivers, as a defence against rain, and the gnats, which in the Lapland summer are not less teasing than in the torrid zone. In descending one of these rivers, he narrowly escaped perishing by the upsetting of the boat, and lost many of the natural productions which he had collected.

Linnæus thus spent the greater part of the summer in examining this arctic region, and those mountains on which, four years afterwards, the French philosophers secured immortal fame to Sir Isaac Newton. At length, after having suffered incredible fatigues and hardships, in climbing precipices, passing rivers in miserable boats, suffering repeated vicissitudes of heat and cold, and not unfrequently hunger and thirst, he returned to Tornea in September. He did not take the same route from Tornea as when he set out for Lapland, having determined to visit and examine the country on the eastern side of the Bothnian Gulf. His first stage, therefore, was to Ulea, in East Bothnia, and thence to Old and New Carlebay, 84 miles south from Ulea. He continued his route through Wasa, Christianstadt, and Biorneburg, to Abo, the only university in Finland. Winter was now setting in apace; he therefore crossed the gulf by the island of Åland, and arrived at Upsala in November, after having performed, mostly on foot, a journey of ten degrees of latitude in extent, exclusive of those deviations which such a design rendered necessary.

In 1733 he visited and examined the several mines in Sweden, and made himself so well acquainted with mineralogy and the docimastic art, that he was sufficiently qualified to give lectures on these subjects upon his return to the university. The outlines of his system of mineralogy appeared in the early editions of the *Systema Naturæ*; but he did not exemplify the whole until the year 1768.

In the year 1734 Linnæus was sent by Baron Reuterholm, governor of Dalecarlia, with several other naturalists in that province, to investigate the physical productions of that part of the Swedish dominions; and it was in this journey that he first laid the plan of an excellent institution, which was afterwards executed, in a certain degree at least, by himself, with the assistance of many of his pupils, and the result published under the title of *Pan Suecicus*, in the second volume of the *Amanitates Academicæ*.

After the completion of this expedition, it appears that Linnæus resided for a time at Fahlun, the principal town in Dalecarlia, where he tells us that he taught mineralogy and the docimastic art, and practised physic; and where he was very hospitably treated by Dr More, the physician of the place. It also appears that he contracted at this time an intimacy with one of that gentleman's daughters, whom he married about five years afterwards, upon his settling as a physician at Stockholm. In this journey he extended his travels quite across the Dalecarlian Alps into Norway; but we have no particular account of his discoveries in that kingdom. In 1735 Linnæus travelled over many other parts of Sweden, some parts of Denmark and Germany, and fixed his residence in Holland, until his return to Stockholm about 1739. In 1735, the year in which he took the degree of doctor of physic, he published the first sketch of his *Systema Naturæ* in the form of tables, in 12 pages folio.

In 1736 Linnæus arrived in England, and visited Dr Dillenius, the learned professor at Oxford, whom he justly considered one of the first botanists in Europe. It is needless to say, that he visited Dr Martyn, Mr Rand, and Mr Miller, and that he was in a more singular manner indebted to the friendship of Dr Isaac Lawson. He also contracted an intimate friendship with Mr Peter Collinson, which was reciprocally increased by a multitude of good offices, and continued to the last without any diminution. Dr Boer-

haave had furnished him with letters to Sir Hans Sloane; but these, it seems, did not procure him the reception which the warmth of his recommendation appeared to claim.

One of the most agreeable circumstances that happened to Linnæus during his residence in Holland, arose from the patronage of Mr Clifford, in whose house he lived a considerable part of his time, being now as it were the child of fortune. *Exivi patriâ triginta sex nummis aureis dives*, are his own words. With Mr Clifford, however, he enjoyed pleasures and advantages scarcely at that time to be met with elsewhere in the world; that of a garden excellently stored with the finest exotics, and a library furnished with almost every botanic author of note. How happy he found himself in this situation, those only who have felt the same kind of ardour can conceive. Whilst in Holland, Linnæus was recommended by Boerhaave to fill the place, then vacant, of physician to the Dutch settlement at Surinam; but he declined it on account of his having been educated in so opposite a climate.

Amongst his friends at this period may be mentioned Dr John Burmann, professor of botany at Amsterdam, whose name and family are well known in the republic of letters, and to whom our author dedicated his *Bibliotheca Botanica*, having been greatly assisted in compiling that work by the free access he enjoyed to that gentleman's excellent library; John Frederick Gronovius, of Leyden, editor of Clayton's *Flora Virginica*, and who very early adopted Linnæus's system; Baron Van Swieten, physician to the empress queen; Isaac Lawson, afterwards one of the physicians to the British army, who died much regretted, at Oosterhout, in the year 1747, and from whom Linnæus received singular and most obliging civilities; Kramer, well known for an excellent treatise on the docimastic art; Van Royen, botanic professor at Leyden; and Liëberkun of Berlin, famous for his skill in microscopical instruments and experiments. To these may also be added the names of Albinus and Gaubius, and of others, were it requisite to show that our author's talents had very early rendered him conspicuous, and gained him the regard of all those who cultivated medical science; and to which, doubtless, the singular notice with which Boerhaave had honoured him did not a little contribute.

Early in 1738, after Linnæus had left Mr Clifford, and probably when he resided with Van Royen, he had a long and dangerous attack of sickness; and upon his recovery went to Paris, where he was kindly entertained by the Jussieus, at that time the first botanists in France. The opportunity this gave him of inspecting the *Herbaria* of Royen and Tournefort, and those of the above-named gentlemen, afforded him great satisfaction. He had intended to proceed from thence into Germany, to visit Ludwig and Haller, with whom he was in close correspondence; but he was not able to complete this part of his intended route, and was obliged to return without this gratification.

Our author did not fail to avail himself of the advantages which access to the several museums of this country afforded him, in every branch of natural history; and the number and importance of his publications, during his absence from his native country, sufficiently demonstrate that fund of knowledge which he must have imbibed before, and no less testify his extraordinary application. These were,—*Systema Naturæ*, *Fundamenta Botanica*, *Bibliotheca Botanica*, and *Genera Plantarum*; the last of which is justly considered as the most valuable of all the works of this celebrated author. The immense application bestowed upon it the reader may easily conceive, when he is informed, that before the publication of the first edition, the author had examined the characters of 8000 flowers. His last work, published during his stay in Holland, was the *Classes Plantarum*, which is a copious illustration of the second part of the *Fundamenta*.

Linnæus.

About the latter end of 1738, or the beginning of 1739, Linnæus settled as a physician at Stockholm, where he seems to have met with considerable opposition, and was oppressed by many difficulties; but all of these he at length overcame, and got into extensive practice; and, soon after his settlement, married the lady before mentioned. By the interest of Count Tessin, he obtained the rank of physician to the fleet, and a stipend from the citizens for lecturing on botany. And what at this time especially was highly favourable to the advancement of his character and fame, by giving him an opportunity of displaying his abilities, was the establishment of the Royal Academy of Sciences at Stockholm, of which Linnæus was constituted the first president, and to which the king granted several privileges, particularly that of free postage to all papers directed to the secretary. By the rules of the academy, the president held his place but three months. At the expiration of that term, Linnæus made his *Oratio de memorabilibus in Insectis*, on the 3d of October 1739; in which he endeavours to excite an attention and inquiry into the knowledge of insects, by displaying the many singular phenomena that occur in contemplating the nature of those animals, and by pointing out, in a variety of instances, their usefulness to mankind in particular, and to the economy of nature in general.

During all this time, however, Linnæus appears to have had his eye fixed upon the botanical and medical chair at Upsala, then occupied by Rudbeck, who was far advanced in life. Indeed, so intent was he on pursuing his favourite study, that he had determined, if he failed in procuring the professorship at Upsala, to accept the offer which had been made to him by Haller, of filling the botanic chair at Göttingen. However, in course of time, he obtained his wish. In 1741, upon the resignation of Roberg, he was constituted joint professor of physic, and physician to the king, with Rosen, who had been appointed in the preceding year on the death of Rudbeck. These two colleagues agreed to divide the medical departments between them; and their choice was confirmed by the university. Rosen took anatomy, physiology, pathology, and the therapeutic part; Linnæus, natural history, botany, materia medica, dietetics, and the diagnosis morborum.

During the interval of his removal from Stockholm to Upsala, in consequence of this appointment, our professor was deputed by the states of the kingdom to make a tour to the islands of Oeland and Gothland, in the Baltic, attended by six of the pupils, commissioned to make such inquiries as might tend to improve agriculture and arts in the kingdom, to which the Swedish nation had for some time paid particular attention. The result of this journey was very successful, and having proved fully satisfactory to the states, was afterwards communicated to the public. On his return he entered upon the professorship, and on the 17th of October pronounced before the university his *Oratio de Peregrinationum intra Patriam necessitate*, in which he forcibly displays the usefulness of such excursions, by pointing out to the students that vast field of objects which their country held out to their cultivation, whether in geography, physics, mineralogy, botany, zoology, or economics, and by showing the benefit that must accrue to themselves and their country as rewards of their diligence. The animated spirit which pervades the whole of this composition renders it one of the most pleasing and instructive of all our author's productions.

Linnæus was now fixed in the situation which was the best adapted to his character, his taste, and abilities; and which seems to have been the object of his ambition, and the centre of his hopes. Soon after his establishment, he laboured to get the academical garden, which had been founded in 1657, put upon a better footing, and very soon effected it, procuring also a house to be built for the resi-

dence of the professor. The whole had been in ruins ever since the fire in 1702; and at the time Linnæus was appointed professor of botany, the garden did not contain above fifty plants that were exotic. His correspondence with the first botanists in Europe soon supplied him with great variety. He received Indian plants from Jussieu of Paris, and from Van Royen of Leyden; European plants from Haller and Ludwig; American plants from Mr Collinson, Mr Catesby, and others; and a variety of annuals from Dillenius: in short, how much the garden owed to his diligence and care in a few years, may be seen by the catalogue published under the title of *Hortus Upsaliensis, exhibens Plantas Exoticas horto Upsaliensis Academiae a sese (Linnæo) illatas, ab anno 1742 in annum 1748, additis differentiis Synonymis, Habitationibus, Hospitiis, rariorumque Descriptionibus, in gratiam Studiosæ Juventutis*, Holm. 1748, 8vo. By this catalogue it appears that the professor had introduced 1100 species, exclusively of all the Swedish plants and varieties, which, in ordinary gardens, amount not unfrequently to one-third of the whole number. The preface contains a curious history of the climate at Upsala, and the progress of the seasons throughout the whole year.

From the time that Linnæus and Rosen were appointed professors at Upsala, the credit of that university, as a school of physic, increased. Numbers of students resorted thither from Germany; and in Sweden itself many young men were invited to the study of physic, who otherwise would have engaged in different pursuits.

Whilst Linnæus was meditating one of his capital performances, long expected and greatly wished for, he was interrupted by a tedious and painful attack of the gout, which left him in a very weak and dispirited state; and, at this juncture, nothing seemed to contribute more to the restoration of his spirits than the seasonable acquisition of a collection of rare and undescribed plants.

The fame which our author had now acquired by his *Systema Naturæ*, of which a sixth edition, much enlarged, had been published at Stockholm in 1748, in 8vo, with eight tables explanatory of the classes and orders, had brought, as it were, a conflux of everything rare and valuable in every branch of nature, from all parts of the globe, into Sweden. The King and Queen of Sweden had their separate collections of rarities, the former at Ulricksdahl, and the latter, very rich in exotic insects and shells, procured at a great expense, at the palace of Drottningholm, both of which our author was employed in arranging and describing. Besides these, the museum of the Royal Academy of Upsala had been augmented by a considerable donation from the king, whilst hereditary prince, in 1746, by another from Count Gyllenborg the year before, and by a third from M. Grill, an opulent citizen of Stockholm.

From this time the professor appeared in a more elevated rank and situation in life. His reputation had already procured him honours from almost all the royal societies in Europe; and now his own sovereign favoured him with a mark of distinction and regard, by creating him a Knight of the Polar Star. With science, it was no longer *laudatur et alget*. His emoluments kept pace with his fame and honours; his practice in his profession became lucrative; and we find him soon after possessed of a country-house and gardens at Hammarby, about 5 miles from Upsala. He had, moreover, received one of the most flattering testimonials of the extent and magnitude of his fame that perhaps was ever shown to any literary character, the state of the nation, which conferred it, and all its circumstances, being duly considered. This was an invitation to Madrid from the King of Spain, there to preside as a naturalist, with the offer of an annual pension for life of two thousand pistoles, letters of nobility, and the unrestricted exercise of his own religion. But after the most grateful acknowledgments of

Linnæus.

Linnæus. this singular honour, he respectfully answered, "that if he had any merits, they were due to his own country."

In 1755 the Royal Academy of Sciences at Stockholm honoured our professor with one of the first premiums, agreeably to the will of Count Sparree, who had decreed two gold medals, of ten ducats value each, to be annually given by the Academy to the authors of such papers, in the preceding year's *Stockholm Acts*, as should be adjudged most useful in promoting agriculture in particular, and all branches of rural economy. This medal bore on one side the arms of the Count, with this motto, *Superstes in scientiis amor Frederici Sparree*. Linnæus obtained it in consequence of a paper *De Plantis quæ Alpium Suevicarum indigenæ, magno rei œconomicae et Medicæ emolumento fieri possint*; and the ultimate intention was to recommend these plants as adapted to culture in Lapland. This paper was inserted in the *Stockholm Acta* for 1754, vol. xv. Linnæus also obtained the *præmium centum aureorum*, proposed by the Imperial Academy of Sciences at St Petersburg, for the best paper written to establish or disprove, by new arguments, the doctrine of the sexes of plants. It was an additional glory to Linnæus to have merited this premium from the St Petersburg Academy, inasmuch as a professor of that society, a few years before, had, with more than common zeal, although with a futility like that of the other antagonists of our author, endeavoured to overturn the whole Linnæan system of botany, by attempting to show that the doctrine of the sexes of plants had no foundation in nature, and was unsupported by facts and experiments.

It appears that Linnæus, upon the whole, enjoyed a good constitution; but that he was sometimes severely afflicted with a *hemiplegia*, and was not exempted from the gout. About the close of 1776 he was seized with an apoplexy, which left him paralytic; and at the beginning of the year 1777 he suffered another attack, which very much impaired his mental powers. But the disease supposed to have been the more immediate cause of his death, was an ulceration of the urinary bladder, of which, after a tedious indisposition, he died, on the 11th January 1778, in the seventy-first year of his age. His principal works, besides those already mentioned, are—The *Iter Oëlandicum et Gotlandicum*; *Iter Scanicum*; *Flora Suecica*; *Fauna Suecica*; *Materia Medica*; *Philosophia Botanica*; *Genera Morborum*; different papers in the *Acta Upsaliensia*, and the *Amœnitates Academicæ*. The last of his treatises was the *Mantissa Altera*, published in 1771; but before his death he had finished the greater part of the *Mantissa Tertia*, afterwards completed and published by his son.

To the lovers of science it will not appear strange that uncommon respect was shown to the memory of this great man. We are told, "that on his death a general mourning took place at Upsala, and that his funeral procession was attended by the whole university, as well professors as students, and the pall supported by sixteen doctors of physic, all of whom had been his pupils." The King of Sweden, after the death of Linnæus, ordered a medal to be struck, one side of which exhibits Linnæus's bust and name, and the other Cybele, in a dejected attitude, holding in her left hand a key, and surrounded with animals and growing plants, with the legend, *Deam luctus angit amissi*; and beneath, *Post Obitum Upsaliæ, die x. Jan. M.DCC.LXXVIII. Rege jubente*. The same generous monarch not only honoured the Royal Academy of Sciences with his presence when Linnæus's commemoration was held at Stockholm, but, as a still higher tribute, in his speech from the throne to the assembly of the states, he lamented Sweden's loss by his death.

Linnæus's stature was diminutive; his head was large, and its hinder part very high; his look was ardent, piercing, and apt to daunt the beholder; his ear was insensible

to music; and his temper quick, but easily appeased. Nature had been eminently liberal in the endowment of his mind. He possessed a lively imagination, corrected by a strong judgment, a most retentive memory, unremitting industry, and the greatest perseverance in all his pursuits. This is evident from the continued vigour with which he prosecuted the design formed so early in life, of totally reforming and constructing anew the whole science of natural history. This fabric he raised to a degree of perfection unknown before; and had the uncommon felicity of living to see his own structure rise above all others, notwithstanding every discouragement. Neither has any writer more cautiously avoided the common error of building his own fame upon the ruin of another man's. He ever acknowledged the merits of each author's system; and no man appears to have been more sensible of the partial defects of his own. Those anomalies which had principally been the objects of criticism he well knew that every artificial arrangement must abound with; and having laid it down as a maxim, that every system must finally rest on its intrinsic merit, he willingly committed his own to the judgment of posterity. Perhaps there is no circumstance of Linnæus's life which shows him in a more dignified light than his conduct towards his opponents.

The great improvement in descriptive natural history for which we are indebted to Linnæus, is the systematic introduction of *trivial* or specific names to designate species. Before his time, the *genus* of a plant or an animal was given, but the species was defined generally by a short description of its peculiarities—a clumsy and difficult method when the species were numerous; but Linnæus added another name to the generic one, to designate each species—as *Quercus Robur*, for the common oak; *Pinus Picea*, for pitch pine; *Canis Lupus*, for the wolf; *Fringilla Domestica*, for the common sparrow; *Rana Temporaria*, for the common frog; *Salmo Salar*, for the salmon.

LINNHE, LOCH, an arm of the sea, on the W. coast of Scotland, stretching into N. Argyllshire, and separating the district of Lorn from those of Morven and Sunart. It is 22 miles long from the southern extremity of Lismore Island to the mouth of Loch Eil, by 4 in average, and 12 in extreme breadth, at its entrance. It sends off four branch lochs,—viz., Lochs Etive, Creran, Leven, and Eil; and contains several islands, the chief of which are,—Lismore, Shuna, and Balnagowan. It communicates with the Caledonian Canal through Loch Eil. The scenery of its coasts is highly picturesque.

LINT. See HEMP, LINEN, and WEAVING.

LIN-TSING, a large and populous town of China, province of Shangtung, on the Imperial Canal, at its junction with the Eu-ho River, about 200 miles S. of Peking. A famous pagoda, nine storeys high, stands here, built of porphyry, granite, and varnished bricks, besides several temples, one of which contains a colossal idol of gold. A large trade is carried on here by means of the canal.

LINUS, the impersonation of a dirge (*λύρος*), is represented as the son of Apollo, and one of the muses. According to one myth, Linus, having been exposed in his infancy by his mother, came under the foster care of shepherds, but was afterwards torn to pieces by dogs. Another fable says that he was slain by Apollo for his audacity in vieing with that god in a musical contest. His statue stood in a grotto near Mount Helicon. At Thebes and Argos, his death was annually solemnized by the singing of dirges, called *λύροι*; and these two cities, along with Chalcis, contested the honour of possessing his tomb. Another Linus, of later date, is supposed to have been the music instructor of Hercules, and to have been killed by that hero. He is the reputed author of several poems.

LINZ, or LINTZ, a city of the Austrian empire, capital of Upper Austria, situate chiefly on the right bank of the Danube;

Linnhe
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Linz.

Lipari
Islands.

at its junction with the Traun, here crossed by a wooden bridge, 900 feet long, 105 miles W. of Vienna; N. Lat. 48. 19., E. Long. 14. 17. The city is situate in a beautiful part of the country. It has three suburbs, which are larger than the city proper. It is entered by four gates, and is surrounded by a cordon of forts, of which twenty-three are on the right bank of the Danube, and nine on the left. They communicate with each other by a covered way, which is fully 9 miles in circuit. The streets are, on the whole, spacious and well built, and this has been the effect of not a few destructive fires. There are, however, few public buildings of importance. In the Landhaus, which was formerly a Franciscan convent, the parliament of Upper Austria holds its meetings. On an eminence overlooking the Danube, and rising above the rest of the town, is a castle, formerly inhabited by the dukes of Austria, but now used as a prison and penitentiary. In the largest square stands a column to the Holy Trinity, erected by Charles VI. in 1723; and beside it are two fountains, adorned with statues. The only other buildings worthy of note are,—the bank, the theatre, the custom-house, and a large government establishment for the manufacture of carpets. Linz is the see of a bishop, and possesses a cathedral and seven churches. The Matthias Kirche contains a monument of the celebrated Montecuculi. There are also a lyceum, with a theological and philosophical faculty, a large library, and a number of good schools. The charitable institutions are numerous.

The imperial factory, together with the other establishments of this kind, are engaged principally in the manufacture of woollen, cotton, and silk goods, leather, cards, and tobacco; and trade in these articles has greatly extended since the opening of the railway (a tramroad on the American plan) to Gmünden and Budweis, and since, Linz has been a station for steamers on the Danube.

Linz is supposed to have been originally a Roman station, and retained its name of Lentia during the middle ages. In 1036 it was purchased by Leopold II., margrave of Austria. It was attacked in 1626 by Fahdinger, the peasant leader, but it held out successfully. Pop. 31,000.

LIPARI ISLANDS, a group of islands lying off the N. coast of the island of Sicily, to which they belong, forming part of the intendency of Messina, between N. Lat. 38. 20. and 38. 55., and E. Long. 14. 15. and 15. 15. They consist of seven principal islands,—Lipari, Vulcano, Stromboli, Salini, Panaria, Felicudi, and Alicudi, and a number of adjacent islets and rocks. They are all mountainous, rising abruptly on their W. side to a considerable height, and sloping down gradually towards the E. They are evidently volcanic in their origin; and ancient writers mention several active volcanoes, though only one is at present in a state of action,—that on the island of Stromboli, which is constantly burning. The fires in the crater of Vulcano still emit sulphurous vapours; and the soil was burning hot when Spallanzani visited it in 1788. In 1786 it erupted a vast accumulation of sand, with much smoke and flame. The basis of the whole group is hornstone, which is covered with lava, scoræ, pumice-stone, and other volcanic products. The soil thus formed is very absorbent in its character, and hence the inhabitants are obliged to construct capacious cisterns, in which rain-water is carefully preserved for irrigation and other purposes. The land is fertile and well cultivated, producing grapes, currants, figs, prickly pears, corn, cotton, olives, beans, pease, &c. Violent rains sometimes cause great injury to the grounds, owing to their situation and the friability of the soil; and at other times swarms of locusts do great injury to the crops. The cattle are lean and not abundant, as the pasturage is for the most part only adapted to the feeding of goats. Wine and raisins are largely exported, as well as bitumen, pumice, nitre, pozzolano, cinnabar, coral, and fish. Alum at one time formed a considerable article of export, but it has decreased

in quantity, probably in consequence of the diminished heat of the subterranean fires. Some sulphur is still exported, though much less than formerly, owing to a prejudice entertained by the inhabitants that the vapour which arises from its purification infects the air, and is injurious to vegetation. The climate is highly salubrious, and the air mild and refreshing. Storms and earthquakes, however, are frequent. Pop. about 23,000.

Lipari, the largest and most important island of the group, has an area of about 110 square miles, with a population of about 15,000. It is, for the most part, hilly or mountainous, with, however, valleys and plains of great beauty and fertility, producing a much esteemed malmsey wine. Wheat, cotton, beans, pease, and various kinds of fruits, are among its other vegetable products. On several of the mountains are craters of extinct volcanoes. There are also thermal springs in different parts of the island. Lipari, the chief town of the island, and the capital of the whole group, is situate on a steep declivity on the E. side of the island, in N. Lat. 38. 27. 56., E. Long. 14. 57. 50. It is a bishop's see, and the residence of a military governor, and has a commodious harbour with good anchorage. The town is irregularly built, with narrow and dirty streets. The principal public building is the cathedral. The castle, the greater part of which was built by Charles V. after Barbarossa had plundered the town, stands on a large volcanic mass, and incloses the cathedral and some other edifices. A large trade is carried on in the products of this and the other islands. Pop. 12,500.

The Lipari Islands were by the ancients termed *Æolia Insula*, from their king, Æolus, who is fabled to have received from Jupiter power over the winds. They were also called *Hephestiades*, or *Vulcania insula*, as sacred to the god Vulcan, and *Liparenses*, from *Lipara*, the principal of the group. Lipara is said to have been so called from Liparus, son of Auson, one of its kings who flourished before the time of Æolus. It was colonized about B.C. 580, by Dorians from Cnidus and Rhodes, who, as they increased in numbers, extended themselves to the adjoining islands of Didyme, Hieria, and Strongylo. The necessity of defending themselves against the Tyrrhenian pirates led to the establishing of a naval force, with which they themselves not unfrequently resorted to piracy. At the commencement of the first Punic War, in B.C. 264, this island was subject to the Carthaginians, and became an important naval station. Captured by C. Aurelius in B.C. 251, it continued ever after a part of the Roman empire.

LIPETSK, a town of Russia, government of Tambov, 80 miles W. of the town of that name, on the right bank of the Voroniej. In the neighbourhood are well-frequented mineral springs. Pop. about 8000.

LIPPA, a market-town of Hungary, county of Temesvar, on the left bank of the Maros, 30 miles N.E. from Temesvar. The inhabitants are chiefly engaged in agriculture, cattle-rearing, and the potteries, excellent clay being abundant in the vicinity. Some trade in grain, cattle, wine, honey, &c., is carried on. Pop. about 8000.

LIPPE-DETMOLD, a German principality, bounded E. and N.E. by Hanover, Hesse-Cassel, and Lippe-Schaumburg, and on the other sides by Prussian Westphalia, is situate between N. Lat. 51. 45., and 52. 10., E. Long. 8. 34. and 9. 20.; area 438 square miles. It is mountainous and well wooded, interspersed with fertile valleys; an extensive chain of forests called the Teutoburger Wald passes through it, and in the S.W. lies the Senner Heath. The country derives its name from the River Lippe, which rises in the Teutoburger Wald, and joins the Rhine at Wesel. The Weser, which is its most important river, has for its tributaries the Emmer, Exter, Kalle, Bega, and Werra. The Ems passes through the Senner Heath and enters Westphalia. The climate in winter is cold, but in summer

Lipetsk
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Lippe-
Detmold.

Lippe-
Schaumburg
||
Lippi,
Fra Filippo.

it is mild, although somewhat misty and wet. In a country so thickly wooded, the value of the timber, which consists principally of oak and beech, is very great. Of the other natural productions, flax is the most important, but corn, rapeseed, and hemp are also produced in large quantities. The horses bred in the Senner Heath are much prized; horned cattle and sheep are reared in large numbers, and there is a considerable trade in honey. Limestone, gypsum, and iron are the principal mineral products. There are also several saline springs, one of which is said to yield 36,000 bushels of salt annually. There is, on the whole, little manufacturing industry; but in some places there are paper and saw mills, glass-works, and weaving establishments. The principal exports are timber, flax, thread, linen, and wool. The government is a constitutional monarchy; the diet, which consists of the prince and a representative body, meets once in two years; and whilst the states vote in two separate assemblies on questions in general, they vote in one assembly on the question of taxation. Lippe-Detmold furnishes about 700 men to the federal army. The most of the inhabitants belong to the Reformed Church. Pop. (1855) 105,490.

Bernard VIII., who died in 1563, was the first of the ancient house of Lippe who took the title of Count of Lippe. His son, Simon VI., became sole lord of all the lands of Lippe, and it is from him that the present reigning family has descended.

LIPPE-SCHAUMBURG, a principality of N.W. Germany, comprised between Hanover, Lippe-Detmold, and Prussian Westphalia, and having an area of 207 square miles. The country is hilly, especially towards its southern extremity, but the northern portion is level. The Schaumburger Wald is a very large forest in the W. In the N. is the Steinhuder Meer, a small and shallow lake. There are no rivers in the country, except a few very small streams which flow into the Weser. Coals and lime are the mineral products, of the former of which the Bückeberg contains some rich seams. The soil is remarkably productive, yielding turnips, potatoes, flax, rapeseed, corn, and pulse; and of live stock, sheep, horned cattle, pigs, and poultry are reared in great numbers. The manufactures consist principally of linens; and there is a considerable trade in the exportation of the natural products of the country. The government is a constitutional monarchy, and, as a member of the German confederation, it has one vote in the full diet; and, with Lippe-Detmold, &c., occupies the sixteenth place in the confederation. It furnishes 200 men to the federal army. Pop. (in 1855) 29,848.

LIPPI, FRA FILIPPO, was born in Florence in 1412. His father and mother died while he was yet a child, and his father's sister, Mona Lappaccia, sent him, when eight years of age, into the Carmelite convent Del Carmine. The prior, perceiving his inclination and talent for drawing, wisely permitted him every day to study the paintings in the convent chapel, and to be present when Masaccio was engaged in painting them. Lippi profited so well by his visits to Masaccio, that his frescoes on the walls of the convent and church soon became equal to those of his master. Their works in this place, however, were destroyed by fire in 1771.

Elated with his success in painting, Lippi threw off the clerical habit in 1430, and retired to Ancona. Here, when on a pleasure excursion, he and his companions were seized by a Moorish vessel and carried off to Barbary, where he remained for eighteen months in a state of slavery. He owed his liberation to his favourite art. One day, for amusement, he sketched on a wall, with a piece of charcoal, a portrait of his master, who, surprised and delighted with this proof of the young painter's skill, released him from prison, and after he painted some other pieces for him, sent him to Naples in safety. For Alfonso, the Duke of Cala-

bria, he executed a work on panel, which was placed in the chapel of the castle; but he soon left Naples for Florence, where he painted an admirable picture for the nuns of Sant' Ambrogio, which was the means of bringing him under the notice of Cosmo de' Medici. About the same time he painted a work for the chapter-house of Santa Croce, another for the chapel of the Medici palace, and a third for the wife of Cosmo de' Medici, all of which still exist in the picture galleries of Florence. Lippi was restless and fond of sensual pleasure; and, on one occasion, when employed by Cosmo, it was thought necessary to imprison him beside his work; but the impetuous artist, after two days' confinement, made ropes from the sheets of his bed, and dropped himself from the window into the street.

In 1459 he was commissioned by the nuns of Santa Margherita, to paint an altar-piece, when he was so much struck by the beauty of Lucrezia, the daughter of Francesco Buti, who lived in the convent, that he begged the nuns to let him paint her likeness for the Virgin in his picture. They consented, and greatly to their grief, Lippi carried off the young lady. They had a son called Filippo Lippi, who also became a distinguished painter.

Fra Filippo Lippi died at Spoleto in 1469, being at that time 57 years of age. Some have maintained that he was poisoned by the relations of Lucrezia, but this does not seem probable. His death was deeply regretted by very many, and by none more than by his friend Pope Paul II. Lorenzo de' Medici, anxious to do the great painter honour, asked his remains from the Commune of Spoleto, in order that they might be placed in the Cathedral Santa Maria del Fiore, at Florence. The people of Spoleto begged to have the honour of retaining them, and Lorenzo then, at his own expense, placed a marble monument to his memory in the cathedral at Spoleto.

One of the greatest works of this master is his *Death of San Bernardo*, painted for the caputular church of Prato (and still there); and *The Life of Stephen*, in three parts, namely, "The Disputation," "The Stoning," and the "Death of the Protomartyr." This is, perhaps, the finest specimen of the artist's genius. On the other side of the chapel is his *History of John the Baptist*, in which he has painted his own portrait and that of Lucrezia. There are also *The Annunciation*, *St Jerome doing Penance*, and many others. His paintings are characterized by inventive genius, admirable drawing, good colouring, and great power in expressing deep emotion.

LIPPI, Filippo or Filippino, the son of Fra Filippo Lippi, was born in 1459. After the death of his father, he was brought up and instructed by Sandro Botticelli, and also to some extent educated by Fra Diamante. He soon exhibited great invention, and devoting himself ardently to the study of Roman antiquities, introduced into his works banners, mantles, the toga, buskins, helmets, and arms of every description. He was one of the first painters who devoted much attention to such embellishments. At Florence, he completed the chapel of the Brancacci, introducing the portraits of several of his friends. In his picture of *Peter Condemned to Death*, we have his own portrait as a young man; but as he never painted it again, we cannot obtain any likeness of him at a more advanced time of life. He went to Rome on the invitation of Lorenzo de' Medici to paint a chapel for Cardinal Caraffa. He chose for his subject *Events from the Life of Thomas Aquinas*; but he introduced a good deal of fictitious matter into these compositions. He returned to Florence, and painted the Strozzi Chapel, in the church of Santa Maria Novello; on one side is the *Resurrection of Drusiana by John the Evangelist*, and on the other, *San Filippo in the Temple of Mars*. His works are very numerous, but the best are those above mentioned. He died in 1505, in the forty-fifth year of his age.

Lippi,
Filippo.

Lippi,
Lorenzo
||
Lipsius,
Justus.

LIPPI, *Lorenzo*, an historical and portrait painter, and a poet, was born at Florence in 1606, and was educated in painting by Matteo Roselli. Some of his works closely resemble those of his master. His *Crucifixion* and *Triumph of David*, are his best pictures; the former of these is in the Florentine gallery. He painted a good many excellent portraits at Innsprück, which are still to be seen there. His paintings are admired for their simplicity, elegance, and correct drawing. His genius in poetry was evinced by a burlesque, entitled *Malmantile Racquistaro*, published under the fictitious name of Perloni Zipoli. It appeared first at Florence in 1688, 4to, and subsequent editions were published at Florence in 1731, and at Paris in 1768. Lippi died in 1664, in the fifty-eighth year of his age.

LIPPSTADT, a walled town of Prussian Westphalia, government of Arnsberg, and 23 miles N.N.E. of the town of that name, on the left bank of the Lippe. It is entered by five gates, and has a court-house and an orphan hospital. It has brandy distilleries, and manufactures of woollens, leather, vinegar, and starch. A part of it formerly belonged to Lippe-Detmold. Pop. 4862.

LIPSIUS, *Justus*, an eminent critic and antiquary, was born on the 18th of October 1547, at Isque, a village between Brussels and Louvain. After receiving his elementary education at Brussels, he began, at the age of ten, to study Latin at Ath, in Hainaut; and after the lapse of two years, entered the Jesuit College at Cologne. There applying himself to history, philosophy, and Greek, he gave so fair a promise of future eminence, that the Jesuits, who were eager to employ the talents of their pupils in their own service, used all their arts to draw him within their fraternity. Their designs, however, were defeated by his parents, who removed him, in 1564, to the University of Louvain. In addition to his favourite studies of philology and philosophy, Lipsius, at the desire of his father, who had destined him for the legal profession, now began to study jurisprudence. The death of his father, however, in the ensuing year, left him to follow the full bias of his own mind. His first work, *Variarum Lectionum libri tres*, published in 1567, and dedicated to Cardinal de Granvelle, secured for him the patronage of that ecclesiastic, who appointed him his Latin secretary. In this capacity he accompanied the cardinal in that same year to Rome, where he remained till 1569, cultivating an intimacy with several learned men, and poring over the manuscripts preserved in the Vatican and other libraries. On his return to Louvain, he spent a year there with little profit either to his learning or morals. He then set out on a tour, and after travelling in Austria, was passing through Germany towards Louvain; but receiving an alarming account of the war that was raging in the Netherlands, he was induced to settle down at Jena as professor of history and eloquence. After retaining this office for two years, he removed to Cologne in 1574, and there he married a lady descended from a good family in Louvain. In the same year his first edition of *Tacitus* was printed in octavo at Antwerp. He improved the succeeding editions with great assiduity; and the sixth edition, in folio and quarto, was printed at the same place in 1600. His *Antiquarum Lectionum libri quinque* appeared at Antwerp in 1575.

From Cologne, after a sojourn of nine months, he retired to Isque; but upon the renewal of hostilities in the vicinity, he withdrew to Louvain. Here, at the suggestion of his friends, he resumed the study of jurisprudence, and in 1576 took the degree of LL.D. His knowledge of law, though never used professionally, aided his critical labours by elucidating many points in Roman antiquities. In 1577 he published his *Epistolicarum Quaestionum libri quinque*. He became professor of history at Leyden in 1579, and taught there with high reputation. At Louvain he had been a Papist, at Jena a Lutheran, and at Leyden he now became a Calvinist.

At Leyden he produced some of his more elaborate works. *Liquation*. His *Electorum liber primus* appeared in 1580; *Electorum libri duo* in 1582; *De Amphitheatro liber*, to which is subjoined *De Amphitheatris quæ extra Romam libellus* in 1584; *Saturnalum Sermonum libri duo* in 1585; *De recta Pronuntiatione Latine Lingue Dialogus*, dedicated to Sir Philip Sidney, in 1586; and an edition of Seneca's *Tragedies* in 1588. He also published two political works,—*De Constantia libri duo*, in 1584; and *Politiorum sive Civilis Doctrinæ libri sex*, in 1589. This latter treatise, advocating the punishment of dissenters from the established faith, was immediately attacked by Theodore Koornhert, and feebly defended by its author in his *De Una Religione adversus Dialogistam liber*, published 1590. Resigning his chair in 1591, he withdrew to Spa, and afterwards to Mentz; and in the same year was publicly reconciled to the Romish Church. During a sojourn of two years at Spa and Liège, he refused several preferments proffered to him by princes and dignitaries of the Church. Benedictus Arias Montanus, a learned Spaniard, also offered him a share of his house and income during his life, and promised him his entire property after his death. His desire to reside in his native country induced him, however, to reject this offer; and Lipsius finally returned to Louvain as professor of history and eloquence. Here his scanty salary of 800 florins was supplemented by a pension of 1000 florins from Philip II., and one of 200 from Archduke Albert. The high eminence he attained as a professor was confirmed by the publication of the following antiquarian works:—*De Cruce libri tres*, 1595; *De Militia Romana libri quinque*, and *Poliorecticon*, 1596; *Admiranda, sive de Magnitudine Romana libri quatuor*, 1598; and *De Vesta et Vestalibus* in 1603. His *Manuductionis ad Stoicam Philosophiam libri tres*, and his *Physiologiae Stoicorum libri tres*, appeared in 1604; his *Monita et Exempla Politica*, his edition of Seneca the philosopher, and his *Lovanium*, in 1605. He also wrote two detailed accounts of the miracles of the Virgin,—*Diva Virgo Hallensis*, in 1604, and *Diva Sichemiensis*, in 1605. These, furnishing the subject of a bitter controversy, aroused the contempt of Protestants, without securing any sympathy for their promulgator in the Church of Rome. Lipsius died March 23, 1606, dedicating, with his last breath, his academical gown to the Virgin.

His erudition in Latin literature was very great, and was employed with much critical skill in illustrating many different branches of Roman antiquities. Less adapted, through a defective sensibility, to excel in poetical criticism, he was still an able critic of the style and scope of historians, philosophers, grammarians, and rhetoricians. His knowledge of Greek was less intimate; and his exposition of Polybius, incorporated with his *De Militia Romana*, is asserted by Casaubon to have shed no light on the dark passages of the original. The graver charge of plagiarism has been brought against this same work by Scaliger, Salmassius, and many later writers. Nor has his edition of Tacitus, the chief pillar of his fame, escaped this stigma. That his judgment was weak, when beyond the province of criticism, is evinced by the shortsighted views and illiberal spirit of his political treatises. His Latinity, fantastic and unnatural, excited the disgust of his learned contemporaries, and was the subject of a volume of 560 pages by H. Stephanus. In the hands of a few imitative disciples it underwent a tenfold deterioration.

An edition of his entire works, accompanied by a life, was published at Antwerp in 1637, by Aubert le Mire. His original works were published at Wesel in 1675.

LIQUATION, or ELIQUATION, a method of reducing the ores of silver by forming a triple alloy of copper, silver, and lead, which being cast into round masses, are placed on edge in a furnace on an inclined plane of iron, contain-

Liquorice
||
Lisbon.

ing a small channel, and raised to a red heat; as the lead melts out, by its attraction for silver it carries that metal with it, leaving the copper as a reddish-black spongy mass. The silver is recovered by one of the methods described under LEAD. See also ASSAYING. (C. T.)

LIQUORICE, a well-known vegetable product, which was equally known to the ancients, who used it medicinally. This plant, as employed by the ancient physicians, is believed to have been the *glycyrrhizé* of Dioscorides and *glycyrrhizion* of Pliny. The root is obtained from a perennially herbaceous plant, the *Glycyrrhiza glabra*. Met with in some parts of Austria, it inhabits chiefly the deep light soils of Southern Europe, especially Spain, Italy, and France. It is much cultivated in England for medicinal purposes, particularly at Pontefract in Yorkshire, and Micham in Surrey. The root is long, creeping, and succulent, and about the thickness of the thumb, from which shoot forth several simple stems, from two to four feet high. The stems are covered with large, unequally pinnate, yellowish-green leaves of a viscous nature, and bear axillary, racemose, papilionaceous flowers of a whitish colour with purple tips, and succeeded by smooth four-seeded pods.

Liquorice-root consists of lignin, starch, wax, resinous oil, colouring matter, albumen, malic acid, earthy phosphates and sulphates, an azotized crystalline principle and glycion, or glycyrrhine. Liquorice is prepared in Spain, Italy, and Sicily, from the root of *G. glabra* only by inspissating the decoction in copper kettles till the mass is sufficiently thick to be firm when cooled. Made up into sticks of 6 inches long and dried on the leaves of the sweet bay, it is thus imported into Britain. The finest liquorice comes from Italy. It is of a brownish-black colour, smooth, shining and flexible when warm, brittle when cold, and of a very sweet taste. Water dissolves from three-fifths to eleven-twelfths of it; alcohol only about an eighth. The imported liquorice does very well for making lozenges, but when used for sweetening decoctions or as an excipient for pills, it requires to be purified. The extract of the root, when brought into this country, is commonly called Spanish liquorice, or liquorice juice. It is sometimes imported run into boxes of about 2 cwt. each, in which form it is said to be purer than when in sticks. The Russian liquorice root met with occasionally on the continent, but unknown in this country, is inferior to the common, and is said to be cultivated in preference to the ordinary liquorice plant from its greater power of enduring cold. The most dangerous adulteration to be met with in liquorice is copper, obtained from the pans in which it is prepared.

LIRIA (the ancient *Edeta*), a town of Spain, province of Valencia, and 17 miles N.W. of the town of that name. Though mean and neglected in appearance, it has some good buildings among its ecclesiastical structures. On the summit of a hill in the vicinity is the Colegio de San Miguel, an extensive and venerable pile with a handsome and richly decorated church. The inhabitants are chiefly agricultural, but some manufactures of linen, soap, leather, earthenware, &c., are carried on. Pop. about 8000.

LISBON (*Lisboa*, in Portuguese), the metropolis of Portugal, and the chief town of one of the seventeen administrations into which the kingdom is divided, is situate on the right bank of the Tagus (*Tejo*), about 9 miles from its mouth, in N. Lat. 38. 42., and W. Long. 9. 5. It is, therefore, distant about 900 miles in a straight line from London. The ground upon which it stands is very uneven, and hence it is often said to be built upon seven hills, like ancient Rome. Its situation is very fine, and its appearance from the deck of a vessel sailing up the river is highly imposing. Indeed, there are very few cities in the world which present so impressive a *coup d'œil* as Lisbon, viewed from the Tagus. The river is deep enough to float vessels of the largest burden; and here are usually seen several

British men-of-war, surrounded by craft of all sizes from all nations. Lisbon.

The origin of Lisbon is lost in remote antiquity; but there are not wanting fables to carry back its foundation some thousands of years before the Christian era; whilst others attribute its origin to the wandering Ulysses, and affect to trace its name in that of the Ithacan king. Pliny states that its first inhabitants were a warlike tribe called Turduli. It passed successively into the hands of the Phœnicians, Greeks, Carthaginians, and Romans. Julius Cæsar bestowed upon it the title of *Felicitas Julia*, and the rights of a *municipium*. The barbarians who overran the peninsula about A.D. 409 wrested Lisbon from the Romans. The Goths under Theodoric subsequently obtained possession of it, but it passed from them to the Arabs with the rest of the peninsula, after the battle (711) wherein Roderick, *ultimus Rex Gothorum*, was slain. Taken from them by the Spaniards, it soon became Moorish again, but was finally conquered from the invaders in 1147 by Alphonso, first King of Portugal, after a siege of several months, in which he was assisted by an army of crusaders, chiefly English, on their way to the Holy Land. The city was very obstinately defended; but the statement that 200,000 Moors perished during the struggle is doubtless an exaggeration of the victors. About 1372, in the reign of Ferdinand the Handsome, Lisbon was burnt by the King of Castile in the course of a quarrel which arose out of the claim of the Portuguese king to the crown of Castile. Soon after Ferdinand's death, Lisbon was besieged by the Spaniards, but not taken. During the 60 years (1580-1640) that Portugal was subject to Spain, Lisbon fell to the rank of a provincial town. It was captured by the Duke of Bragança, afterwards John IV., in 1640. In 1755 occurred that terrible earthquake, which, assisted by a fire which broke out, reduced the city to a heap of ruins, and destroyed between 30,000 and 40,000 people, with an immense amount of property. Shocks of earthquake, of more or less violence, have been experienced at Lisbon through many centuries, but none has caused such damage and loss of life as that of 1755. The minister Pombal, a man of great talent and energy, applied himself, in the first place, to the preservation of the rights of property, and then to the reconstruction of the city. The handsomest part of the present city was erected under his direction; but even now there are many ruined edifices which speak forcibly of the great *terremoto* and its horrors. When Napoleon issued his decree that the House of Bragança had ceased to reign in Europe, the Regent Don John was compelled to desert the country for Brazil, and the next day a French army under Junot entered Lisbon (29th November 1807); possession of which was retained until the 15th September 1808, when Junot quietly embarked his army under the protection of the disgraceful Convention of Cintra.

In the absence of an authoritative census, the population of Lisbon may be roughly estimated at 250,000. With this number of inhabitants it ranks amongst the most populous capitals of Europe, and is much before Madrid, with only 176,000 inhabitants. The separate households amount to about 47,800; and the city with its suburbs is divided into 39 parishes, containing 354 streets, 216 lanes, 12 large squares, 5 public gardens, and 34 fountains. There are three royal palaces, four theatres, and a circus for bull fights. Until of late years, travellers have had just reason to complain of the filthy state of the streets. (Byron, it will be remembered, speaks in *Childe Harold* of the many "things unsightly to strange ee.") But things have been much altered for the better, and, except in some of the small out-of-the-way streets, there is now little to find fault with either as regards the paving, the lighting, or the cleanliness. Gas made from British coal was introduced about the year 1850. Excellent water flows to the fountains distributed

Lisbon. throughout the city, from which it is removed in barrels to the houses by *Gallegos*, men from Galicia who do the principal part of the hard work in Lisbon. The supply of water is not, however, in summer adequate to the requirements of the place, and a company has been lately formed for the obtaining of a further supply.

Lisbon stretches along the shore of the Tagus for 4 or 5 miles, and extends northward over the hills for nearly 3 miles. Much of it, however, is scattered; and in all but the densest parts, there are gardens and unoccupied patches. For municipal purposes the city is divided into four districts (the whole under one municipal chamber), and two suburban districts, under separate chambers. The crown is represented by the civil governor, who is at the head of the police. For the most part the streets are very irregular; but that portion which suffered most from the great earthquake, and which had to be wholly rebuilt, is occupied by lofty houses, arranged in long streets, on a uniform plan. Here are the four principal squares. One of these squares, the *Praça do Commercio*, is surrounded on three sides by the custom-house and government offices, with a spacious arcade beneath. On the fourth it is open to the river; and in the middle is a grand equestrian statue, in bronze, of Joseph I., in whose reign the earthquake and the rebuilding took place. This is the only statue in the city. The square is 583 feet by 536, and its appearance is strikingly handsome. From one side of it run several parallel streets, which terminate in another handsome square, the *Praça de Don Pedro*, surrounded on three sides by large houses, the ground stories of which are used as shops; whilst on the fourth side stands the new theatre of Dona Maria II. A grand triumphal arch is being erected in the former square, at the termination of the principal street connecting the two. The public gardens are small, but much frequented. The hotels of Lisbon, notwithstanding the great influx of strangers, offer only indifferent accommodation; whilst the shops present little display, and are ill-supplied with wares.

The palace where the king actually resides (the *Palacio das Necessidades*) is a large unsightly building, to which a good garden is attached. The palace of *Ajuda*, in the Italian style, situate upon a hill above the suburb of *Belem*, was commenced upon a very grand scale, but has been left incomplete. Receptions, however, sometimes take place here. It contains a good library, and some bad pictures. If ever finished, it will be one of the handsomest palatial edifices in Europe. Several of the nobility have good and spacious houses in the city, which are dignified by the name of palaces. Two or three small forts, one on a rock at the mouth of the Tagus, defend the city from the approach of a hostile fleet; but its chief defence is the citadel of St George, which occupies a commanding position on a rocky hill. This part of Lisbon is ancient, and is composed of narrow, tortuous streets: it retains the old Moorish appellation of *Alfama*. The churches are numerous, and are nearly all in the same tasteless Italian style; the interiors, overlaid by heavy ornament, contain pictures utterly devoid of merit. Perhaps the one best worth visiting is the *Estrella*, with a dome and two towers, something on the plan of St Paul's at London. The view from the dome is very extensive. The church of St Vincent de Fora, standing in a conspicuous position near the citadel, is considered to be the largest in Lisbon; its dimensions being 222 feet by 82. In an attached chapel, recently built, the coffined corpses of most of the Portuguese monarchs are deposited, and are exhibited to the public on certain days in the year. In the church of St Roque is a chapel, which was constructed at Rome of silver and the richest stones, by order of John V., and which was first erected at Rome, in order that the pope might perform mass in it, previous to its shipment to Lisbon. It is said to have cost upwards of £120,000. Part of the cathedral behind the high altar

is ancient, and deserves inspection. Near the custom-house is a church, formerly a synagogue, with an old and richly-carved portico. At the Carmo are the ruins of a church in the pointed style. It was commenced to be rebuilt after being thrown down by the earthquake, but was not completed. These seem to be the only remains of what we should term Gothic architecture to be found in Lisbon itself; but at Belem there is the church of St Jeronimo, commenced in 1500, on the spot where Vasco de Gama embarked, three years before, on his famous voyage to India. This, and the adjacent cloisters of an extinct monastery, are very interesting.

The museums of Lisbon exist but in name; and the botanical garden at Ajuda is wretchedly managed. The gallery of the Academy of Fine Arts contains only two or three pictures worth notice; and the private collections, of which there are few, are generally poor. The great public library consists, for the most part, of old theological works and ecclesiastical histories, swept out of various suppressed monasteries. The books, uncatalogued and uncared for, are rotting to pieces. They are said to be about 86,000 in number, and with them are kept 8000 MSS., and a collection of 24,000 coins. The Library of the Academy of Sciences, amongst its 50,000 volumes, hardly contains a modern book on any branch of science. The King's Library, at the Necessidades Palace, is said to contain 28,000 volumes; and that at the Ajuda Palace, 20,000 volumes. The Patriarch's Library contains 24,000 volumes. The Portuguese take very little interest in literature, science, or art, and almost everything connected with them is in a neglected state. The national printing-office, however, seems in good hands, though the work done is not of the highest class, or of great extent. This is a government establishment, in imitation of those at Paris and other continental cities. Literary and scientific societies are few in number, and of little importance. The principal one is the Royal Academy of Sciences, founded in 1779; its transactions are scarcely known out of Lisbon, though represented by the Portuguese themselves to be numerous and most important; whilst the voluminous memoirs are said to form an inexhaustible treasury of science. Eight newspapers appear daily in Lisbon, and six weekly, the total circulation of which is thought not to exceed 3500 copies. There are, besides, various fortnightly and monthly publications, five of which are medical, and two religious periodicals. The booksellers' shops are few, and badly stocked.

As the metropolis of the kingdom, Lisbon contains the various offices of the central government, most of which are in the *Praça do Commercio*. Here, also, meets the municipal chamber, a body consisting of a president and eleven members, called *vereadores*, whose duties are to superintend the lighting, paving, and cleansing of the city, to establish regulations for safety against fire, and for the proper distribution of the water brought by the aqueduct. The two chambers of parliament hold their sittings in a huge building, formerly the monastery of St Bento. A telegraphic wire has been lately put up, to establish electric communication between the office of the minister of public works, the chambers of parliament, and the royal palaces of Necessidades and Cintra. The supreme courts of justice sit in Lisbon, as well as various minor tribunals. Here are also naval and military arsenals. Attached to the naval arsenal is a school, an observatory, and a hydrographical office. There are barracks in various parts of the town for the accommodation of the soldiery. The armed municipal guard consists of 160 cavalry, and 1170 infantry. The aqueduct spoken of above was erected more than 100 years ago, in the reign of John V. It brings water from certain springs, situate about 7 miles to the N.W. of Lisbon, and crosses, in its course, 127 arches of excellent workmanship, 35 of which form the bridge across the valley

Lisbon.

Lisbon. of Alcantara; the extreme height here being 263 feet. There is a tradition, that only one stone was shaken from the parapet of this bridge at the great earthquake, the aqueduct beyond being wholly uninjured. Through its whole length, the aqueduct is arched overhead, at a height of 8 feet above the floor; and there is a foot-path between the water-courses. On approaching Lisbon it is divided into three branches, the middle one of which terminates at a large square tank, 31 feet deep, the vaulted roof of which is supported on thick pillars. There is a broad walk round the tank, and from the flat roof an extensive view is obtained. On leaving the tank, the water is conducted along two channels to different points of the city.

There are several cemeteries near Lisbon, and the practice of interring in churches has for some years been abandoned. The monthly mortality may be estimated at 600. In the cemetery set apart for the English lies our novelist Fielding, who died at Lisbon in 1754. A large marble sarcophagus, bearing a long Latin inscription, covers his remains. The British residents maintain a chaplain, who performs service weekly in an adjacent chapel. The largest of the hospitals is that of St José, where there is an average number of 900 patients. The great lunatic asylum of Rilhafoles usually contains nearly 400 patients. At the founding hospital more than 2000 infants are annually received. There is a very interesting establishment at Belem, called the Casa Pia, where 900 children of both sexes are clothed, maintained, and educated gratuitously.

Ecclesiastically, Lisbon is a patriarchate, the holder of the dignity being at the head of the clergy, and president of the Chamber of Peers.

Lisbon is the largest port in the kingdom. The custom-house is a spacious and very substantial building, worthy of any capital in Europe. As the merchants are allowed to deposit their goods here for a year (two years for Brazilian produce) free of duty, it saves them the expense of private warehouses; and this arrangement offers great advantages to the trading community, which are generally taken advantage of. In 1851 there entered the port of Lisbon 1908 vessels, having an aggregate tonnage of 198,893. The produce of the Lisbon custom-house, after paying its expenses, amounted, in 1851, to L.477,700; that of the municipal custom-house, where a duty similar to the French *octroi* duty is levied upon all articles of consumption entering the city, to L.209,400. A large body of foreigners dwell here in the character of merchants, nearly fifty of whom are British firms. Brazil and Great Britain are the two countries with which the most active commerce is carried on; tropical produce being imported from one, and manufactures from the other,—wine and oil being sent to both in return. Lisbon has one joint-stock bank, called the Bank of Portugal, a few fire and life insurance offices, and some joint-stock companies, the chief of which are,—the Company for Cultivating the Productive Islands in the Tagus, with a capital of L.45,000; the Newfoundland Fishery Company, with a capital of L.11,000; the Lisbon Spinning and Weaving Company, with a capital of L.20,000; and the Gas Company, with a capital of L.10,000. Manufactures are carried on only to a small extent at Lisbon, and machinery is little employed. There are a few steam-mills for grinding corn, expressing oil, and sawing wood. There is also a large sugar-refinery, as well as some woollen, cotton, and silk mills, but none of these will bear comparison with British establishments of the same kind. All the coal employed at these places is imported from England. In the immediate neighbourhood of Lisbon stands the tobacco manufactory, belonging to a company which has a monopoly from government for the whole kingdom, paying L.294,000 annually for the privilege. About 1600 persons are employed here, and three millions of lbs. of tobacco are manufactured in the year. The machinery is set in motion

by two steam-engines, and, like most of the machinery at Lisbon, is of British make. Several small steamers ply on the river, and connect Lisbon with the neighbouring towns on its banks. There is communication three times a-month with Southampton by means of the Oriental and Peninsular Company's steamers, which call here on their way to the Mediterranean. The steam-packets of a British-Brazilian Company call here monthly, on their way to and from Rio Janeiro; and the Portuguese have also a line of their own to Brazil. There is also steam communication two or three times a-month with Liverpool. Various steamers connect Lisbon with Oporto, Setubal, and the towns of the Algarve. A monthly steamer to the Azores has been projected. As to railways, Portugal does not yet possess one; but a line is in progress from Lisbon to Santarem, a town 44 miles distant, and a short line to Cintra, 17 miles in length, has been projected. A company has been formed to make a line from a point on the opposite bank of the Tagus towards Badajoz, in Spain. Lisbon is tolerably well supplied with flesh-meat, fish, and country produce. A large quantity of excellent fruit is brought into the city for sale during the season. A few lines of omnibuses connect Lisbon with the suburbs and neighbouring villages. These are usually drawn by mules, and are very inconvenient. The same remark may be made of the old-fashioned, rickety carriages which stand for hire in various parts of the city. Some of the private carriages are neat, but small. A heavy duty, amounting almost to a prohibition, is levied on all foreign-made carriages; and hence the Portuguese are obliged to content themselves with vehicles of an inferior class.

The British nation has a minister at the court of Lisbon: he receives a salary of L.4000 per annum, the consul L.600, and the vice-consul L.300.

The climate of Lisbon may be considered healthy: the winter is very mild, frost and snow being rare. In summer the heat is great, and all who have the means betake themselves during the hot months to Cintra, or to some part of the neighbouring sea-coast, where they may have the benefit of a cooler atmosphere. According to the observations of Franzini, extending over twenty years, the mean temperature of Lisbon is 61° Fahr., and the mean fall of rain for sixteen years was 22.9 inches; the mean height of the barometer (corrected to the temperature of 63° Fahr.), at an altitude of 285 feet above the sea, was 30.034 inches. The observations for sixteen years give, as the mean temperature of the seasons,—Winter, 52°; Spring, 60°.5; Summer, 71°.3; Autumn, 59°.5 Fahr. It will give some idea of the fluctuations of the climate to note, that, during the year 1845–55 (an exceptional year), the maximum temperature was 96° 60, and the lowest 31° 64 Fahr., when there was hoar-frost. The prevalent winds, and the number of days on which they blew on the average of sixteen years, were, according to Franzini,—N., 144 days; N.W., 123; S.W., 138. A meteorological observatory has been lately established at the Polytechnic School, which appears to be under good management.

Like London and Paris, Lisbon stands in a basin of the tertiary formation. The upper beds of this basin consist of loose sand and gravel, destitute of organic remains, and not rising to a greater height than 150 feet above the sea. Below these is a series of beds called, by Mr D. Sharpe, the Almada beds, composed of yellow sand, calcareous sandstone, and blue clay, rich in marine remains. It is upon these beds that the greater part of Lisbon stands. Some of them are well exhibited in the cliffs on the S. side of the Tagus, and others have been laid open by the railway cuttings on the N. bank to the E. of the city. They appear to belong to the older Miocene, and have no equivalents in Britain. Mr James Smith ranks them as older than the Touraine beds, and as nearly of the same age as those of Bordeaux and Dax. The total thickness of the

Lisburn. Almada beds, as far as they are disclosed, may be between 400 and 500 feet. Upwards of 150 species of fossils have been obtained from these beds, of which 124 have been determined, and 20 ascertained to be new and peculiar. About 28 per cent. are of recent species. Next comes a tertiary conglomerate, destitute of organic remains, having in one section a thickness of 200 feet. The tertiary deposits cover altogether an area of between 2000 and 3000 square miles. They are separated, near Lisbon, from rocks of the secondary epoch by an immense mass of basalt, which overflowed the secondary formations before the deposition of any of the tertiary strata, and contributed by its degradation to form the conglomerate just mentioned. The principal deposit of the basalt has an extreme length of 20 miles, with a greatly varying width. The uppermost of the secondary deposits is a formation, named by Mr D. Sharpe the *Hippurite limestone*, and classed by him as the equivalent of the chalk of Northern Europe. The narrow valley of Alcantara, in the immediate neighbourhood of Lisbon, has been excavated in this deposit; and here there are extensive quarries, where abundance of fossils may be collected. Thirty-four species have been detected, of which 55 per cent. are new. They are principally *Lamellibranchiata*, *Gasteropoda*, and *Radiata*, without any *Cephalopoda* or *Brachiopoda*. This formation, which has a total thickness of upwards of 500 feet, was probably deposited in a quiet sea of moderate depth. Between the Hippurite limestone and the granite range of Cintra, the highest part of which is about 2000 feet, there have been observed four deposits, for information as to which we must refer to Mr D. Sharpe's *Memoirs*. In speaking of the Almada formation, a bed of blue clay was mentioned. Mr Sharpe discovered, by careful investigation, that the greatest force of the earthquake of 1755 was expended upon the area of this clay, and that not one of the buildings standing upon it escaped. Those upon the slopes of the hills immediately above the clay suffered very severely, and the whole of the tertiary strata were more or less affected by the shocks; whilst none of the buildings erected upon the Hippurite limestone or the basalt suffered any injury whatever; the line at which the earthquake ceased to be destructive corresponding exactly with the boundary of the tertiary beds.

LISBURN, a market-town and parliamentary borough of Ireland, is situate on the Lagan, partly in Upper Castle-reagh barony, county of Down, and partly in Upper Maserene barony, county of Antrim, 8 miles S.S.W. from Belfast by the Ulster Railway. Having been destroyed by fire in 1707, the town has a modern aspect. It consists chiefly of a long irregular street of houses, well built, and roofed with slate. It is paved, and lighted with gas. At the end of the main street stands the cathedral for the united diocese of Down and Connor,—a picturesque edifice, surmounted by an octagonal spire, of date 1807, and containing the tomb and monument of its bishop, Jeremy Taylor, who died at Lisburn in 1667. There are also a chapel of ease, a Presbyterian church, a Roman Catholic chapel, and meeting-houses for Methodists and Quakers. Besides several schools, it has an institution endowed by John Hancock, for the maintenance and education of forty Quaker children, an infirmary for the county of Antrim, a union workhouse, and a linen hall. The gardens of the old ruined castle are open to the public. Its manufactures are,—linen thread, damasks, muslins, and diapers, and flax-spinning and bleaching are extensively carried on. Great facilities for trade are afforded by its position on the railway and on the river, and its weekly markets on Tuesday are well supplied with manufactured and agricultural produce. Its fairs are held on the 21st of July and the 5th of October. It is the seat of courts for Kilultagh Manor, courts leet, and petty sessions. The borough returns a member to parliament, and gives the title of Viscount to the family of

Vaughan. Lisburn was founded by Viscount Conway, in 1627, beside the castle which his ancestor Sir Fulk Conway had erected in 1610, and was first inhabited by English and Welsh settlers. In 1641 it was laid in ashes by the Irish insurgents. Huguenot families, fleeing thither after the revocation of the Edict of Nantes, imported the linen manufacture. It was again burnt in 1707, but rapidly resumed its prosperity, and is now in a flourishing condition. Pop. (1851) 6569.

LISIEUX (anc. *Noviomagus*, or *Lexovium*), a town of France, capital of a cognominal arrondissement in the department of Calvados, on the right bank of the Touques, 27 miles E. from Caen. It stands in a beautiful valley, and is surrounded by villas and gardens. Its streets, with the exception of the principal one, which forms part of the road between Caen and Evreux, are narrow and winding, and the houses, which are high and antiquated, are built of wood. Its finest buildings are the cathedral, a Gothic structure of the twelfth century, which contains a chapel dedicated to the Virgin (built by Pierre Cauchon, Bishop of Lisieux, whose memory is stained by the part he took in the execution of Joan of Arc), the bishop's palace, a handsome edifice, surrounded by fine gardens, and the theatre. The town contains a communal college, and an ecclesiastical seminary. It has tribunals of primary jurisdiction and of commerce; manufactures of woollen cloth, flannels, cotton and linen yarn; and bleachfields, tanyards, paper and fulling mills, and dyeworks. There is also a considerable trade in fruit, corn, hemp, cider, and flax, which is facilitated by the river being navigable at high water from Lisieux to its mouth. So early as the fourth century, Lisieux was attacked, and almost completely destroyed by the Saxons. The Normans pillaged it in the eighth century, and retained it for a considerable time. It has since been frequently besieged and captured, and was last taken by Henri Quatre in 1588. The fortress was formerly one of great consequence, but the ramparts have been changed into elegant promenades. Pop. (1851) 11,428.

LISKEARD, a parliamentary and municipal borough of England, county of Cornwall, on the Liskeard and Looe Canal and Cornwall Railroad, 16 miles W. by N. of Plymouth. It is built partly on rocky hills, and partly in a hollow; the streets are narrow and irregular, and the houses have a mean appearance. Some handsome buildings have, however, recently been erected in the immediate vicinity. The town-hall, built in the beginning of the eighteenth century, is large and handsome, supported on granite columns. The parish church is a fine Gothic edifice of the fifteenth century, with a tower of more recent date at the west end. The Methodists, Independents, Baptists, and other denominations, have also places of worship here. There are also a grammar and other schools, a mechanics' institution, and a mutual improvement society. The manufactures of Liskeard are few and unimportant, the inhabitants being chiefly dependent on the agricultural and mineral produce of the neighbourhood. Serges and leather are, however, manufactured here. The municipal affairs of the town are intrusted to a mayor, four aldermen, and twelve councillors; and it returns one member to parliament. Pop. (1851) municipal borough, 4386; parliamentary borough, 6204.

LISLE, JOSEPH NICHOLAS DE, an eminent astronomer and geographer, was born at Paris in 1688. His education was commenced under his father, and completed at Mazarin College. An eclipse of the sun in 1706 discovered his taste for mathematics, and to the mathematical sciences he began thenceforth to apply himself. He was appointed engineer at Martinico in 1707; and, in 1709, when he was the correspondent of some of the ablest astronomers in Europe, he had constructed a very accurate quadrant for his own use. He received, in 1715, the grant of a pension of

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600 livres, but not until pecuniary difficulties had degraded him into an astrologer in the pay of the regent. In that same year he calculated tables of the moon according to the Newtonian theory. Being elected a member of the Academy of Sciences in 1714, he delivered before that body, in 1723, a memoir on the transits of Mercury. In the ensuing year he visited England, and, through Halley and Newton, was elected a member of the Royal Society. A similar honour was afterwards conferred upon him by every literary society in Europe. In 1726 he accepted an invitation from Catherine I. to the chair of astronomy in the Imperial Academy of Sciences at St Petersburg. Travelling into Siberia, in 1740, to observe the transit of Mercury over the sun's disc, he was disappointed in his main object by the cloudiness of the atmosphere, but collected much valuable information on the geography of that country. With the aid of his brother Louis, he constructed a map of Russia; and was engaged at intervals for forty years in meteorological observations. After a stay of twenty-one years in Russia, he returned to Paris, and was elected professor of mathematics in the Royal College, where Lalande and Messier were his pupils. Previous to the transit of Mercury over the sun in 1753, he published a map of the world, representing the effect of that planet's parallaxes in different countries. In 1754 he was appointed by the King of France astronomical geographer to the marine. His last work was an account of the comet of 1758, inserted in the *Memoirs of the Academy*. About the same year he withdrew to the Abbey of St Geneviève, where he died of apoplexy, 11th September 1768. Besides his papers, the principal of which have been mentioned, De Lisle wrote a *History of Astronomy*, 2 vols. 4to, 1738.

LISMORE, an ancient town of Ireland, county of Waterford, on the right bank of the Blackwater, 30 miles N.E. by E. of Cork, and communicating with Youghal by canal and the Blackwater. It stands on an elevation overlooking the river, having on the E. the cathedral, an elegant building with a tower and spire, and on a rocky precipice on the W. the massive old castle. The Blackwater is here crossed by a fine bridge, the centre arch of which has a span of 100 feet. Its chief buildings, besides the above-named, are,—a Roman Catholic chapel, a Presbyterian place of worship, a classical and other schools, a fever hospital, and several alms-houses in behalf of aged Protestant soldiers. Trade is here confined to the agricultural produce of the district, and slates from neighbouring quarries. Lismore is said to have originated from a monastery founded here by St Carthagh in the seventh century. Two centuries later it was several times pillaged by the Danes. In the thirteenth century King John of England founded the castle which, with the town, suffered much during the rebellion of 1641. From that time the town long continued in a state of decay, until it became the property of the Devonshire family, when great improvements were made. The castle is now in complete repair. Pop. (1851) 2340.

LISMORE (Gaelic, *Leosmore*, "The Great Garden"), an island off the W. coast of Scotland, in the county of Argyll, is situate at the mouth of Loch Linnhe, about 7 miles N.N.W. from Oban. Its greatest length is about 10 miles, its average breadth $1\frac{1}{2}$ miles, and its area about 8000 acres. The greater part of the island is under cultivation, and the remainder, though rocky, is covered with a rich green sward, variegated by small clumps of trees. Herring-fishing is carried on by the inhabitants; and limestone is exported. In ancient times the bishops of Argyll inhabited the Castle of Lismore, now in ruins, and were on that account sometimes styled *Episcopi Lismorienses*. There are also the remains of the small Cathedral of St Moluac, the chancel of which is used as a parish church. Pop. (1851) of the united parishes of Lismore and Appin, 4097.

LISSA (Pol. *Leszno*), a town of Prussia, in the pro-

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vince of Posen, and 42 miles S.S.W. from the town of that name. Its chief buildings are several churches, a Protestant gymnasium, a synagogue, and a castle. There are extensive manufactories of woollen and linen cloths, leather, tobacco, and chicory. It has a small trade in wine. Pop. (1849) 9635.

LISSA (ancient *Issa*), an island in the Adriatic, off the Dalmatian coast, about 10 miles in length by 5 miles broad, in N. Lat. 43. 5., E. Long. 16. 10. Its shores are generally steep and rocky, and it is only accessible at a few bays. The soil is barren; wine and anchovies form the chief products. Issa was long known to the ancients, and is said by Scylax to have been peopled at an early period by Greeks. During the ascendancy of Rome, the inhabitants had the privileges of Roman citizens, and often assisted that power in its maritime expeditions. In modern times it is famous for the victory gained by the British under Sir W. Hoste over a French squadron, in 1811, after which it was occupied for some time by British troops. The chief town and seaport is San Giorgio, or Liſſa, situate on the N.E. shore, with a pop. of 2800. Pop. of island, 5200.

LISTER, THOMAS HENRY, a novelist, the only son of Thomas Lister, Esq. of Armitage Park, was born in 1801. He produced three novels,—*Granby* in 1826, *Herbert Lacy* in 1827, and *Arlington* in 1832; all descriptive of the manners of the higher classes, of which the author was a member. Without displaying any originality or much skill in the management of a plot, these works are marked by shrewd reflection, a faultless taste both in thought and diction, and a faithful painting of fashionable life. In 1838 Lister published *The Life and Administration of the Earl of Clarendon*, which is now considered a standard biography. Previous to his death, in June 1842, he held the office of registrar-general.

LISTOWEL, a market-town of Ireland, county of Kerry, on the right bank of the River Feale, about 16 miles N.N.E. from Tralee. The town, which has of late years been much improved, consists of one main street, with several small streets diverging from it. There is also a spacious square containing the ancient dilapidated castle, and the parish church. The other principal buildings are,—a fine bridge of five arches spanning the river, an hospital, several schools, a dispensary, and a bridewell. Listowel Castle was the last fortress that held out for Lord Kerry against Queen Elizabeth, and was taken by Sir Charles Wilmot in 1600. Pop. (1851) 3527.

LITHGOW, WILLIAM, a noted traveller, was born in the parish of Lanark in 1583. Early imbued with a propensity for roaming, when he attained to manhood, he set out on a walking tour through the Netherlands, Germany, and Bohemia, trusting probably to benevolence and to his own good fortune to defray the expenses of his journey. He then repaired to Paris, and after remaining there for ten months, proceeded in 1609 to Rome, and afterwards to Naples, trudging along on foot, and refusing on principle the help of any vehicle that passed him on the way. In this manner he wandered through Greece and Asia; and having escaped numberless dangers from robbers, and hardships from exposure to inclement weather, passed over land to Egypt, where three of his fellow-travellers died, and left him their property. He returned to England by Sicily and Paris. Another tour which he made lay through Morocco, Algiers, Tunis, Tripoli, Hungary, Germany, and Poland. On his arrival in London he became an object of interest, and had frequent audiences of James I. Furnished with commendatory letters from the king to all kings, princes, dukes, he sailed to France in 1619, and travelled through Portugal and Spain to Malaga. There he was apprehended as a spy, and after suffering the most horrible manglings and lacerations, first in the prison, and subsequently in the Inqui-

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sition, he was liberated in 1621, and brought to England emaciated almost to death. On recovering his health, he made several futile attempts to gain redress, and, among others, inflicted corporeal chastisement, in the presence-chamber, upon Gondomar the Spanish ambassador. For this

offence he was lodged in the Marshalsea for nine months. He afterwards went to Scotland, and died in his native parish in 1640. The first edition of his *Travels* appeared in London in 1614; the latest in 1814. He also published in 1637 an account of the siege of Buda.

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LITHOGRAPHY.

THE invention of lithography is attributed to Alois Senefelder, whose attention was accidentally directed to the effect of a greasy ink on calcareous stone. This effect was the basis on which, after many trials and failures, he built the whole art; for his work on lithography, published about 1817, although containing some antiquated and even absurd notions of the practical operations, comprises a correct skeleton of the entire system of the present day.

Alois Senefelder was born at Prague on the 6th of November 1771. His father, who was an actor in Munich, gave him a tolerable education. When grown up, he was at first undecided whether to become an actor, an author, a musician, or a soldier; but being reduced to great hardship and misery, he resolved to endeavour to support himself as a composer of music. Unable, however, to pay for the engraving of his compositions, he resolved to engrave them himself. Finding this more expensive and difficult than he imagined, he tried, for the sake of economy, to practise with greasy ink on copper, to etch this afterwards with acid in relief, and to print with the common type printing-press. At this period his mother happening to ask him to keep a note of some account, he jotted it down with his greasy ink on a Kelheim slab. Next day it struck him that he might etch such lines with acid in relief, and adopt the slab as a cheaper material for his own purposes than copper. From this beginning, Senefelder gradually discovered the whole process of lithographic or stone-printing.

His first work printed from stone, in 1796, was a piece of music. In 1800 he obtained a patent in Bavaria, and most of the German states. In 1802 he obtained a patent in Vienna, and commenced there a lithographic establishment, but without much success. M. André of Offenbach, the well-known music publisher, became his partner, and opened establishments in London and Paris, but also with little success. The great secrecy and jealousy with which the manipulation of lithography was guarded, prevented its progress; and it was not until the year 1837 that the excessively complicated manipulations became so simplified as to induce scientific men and artists to lend their aid in its development. Since then, rapid advances have been made in Britain, Germany, France, and America; and its beauty and utility as an art are now fully established.

For many years Senefelder was director of the government lithographic office, and in later years the King of Bavaria settled on him a handsome pension for life. He died at Munich in 1834, after having seen his invention brought to comparative perfection.

The principles on which lithography depends are the following:—1st, The adhesion of an encaustic composition to a peculiar kind of limestone; 2d, The power acquired by the parts covered with this greasy composition of receiving printing-ink, which is a compound of carbon and oil; 3d, The power which we possess of preventing the adhesion of the ink by the interposition of a film of water; and, 4th, The power of again removing the ink from the greased portions by simply pressing an absorbent paper into close contact.

Lithographic stones are found in different parts of the world, but nowhere so perfect as in the immense quarries of Solenhofen, near Pappenheim, on the Danube, in

Bavaria. They vary in colour from a pale yellowish-white, to a light buff, reddish, grayish, bluish, and even greenish colour. The fracture is perfectly conchoidal. The beds commence with layers as thin as paper, but the strata become thicker and thicker, until they form slabs or slates of considerable size. They are, until exposed to the air, tolerably soft, and can easily be worked by the quarrymen. Between these layers very beautiful petrifications are found, of which there is a very complete and interesting collection at the Museum in Munich. The slabs were formerly used in Bavaria and elsewhere for the floors of houses and mosques, and were arranged in geometric patterns, like inlaid tiles. In France, useful lithographic stones have been found in the Department de l'Indre; in England, at Corston, near Bath, and at Stony Stratford; and, more recently, in Canada, the West Indies, and Silesia, but all rather inferior to the Solenhofen stone in character. This calcareo-argillaceous stone resembles the liassic limestone,—occurring in layers, as the lias formation does,—but it does not belong to the same geological period, being of a more recent formation.

The stones used for executing writings or drawings with the pen and brush, engraving and etching, autography, and transfers from copper and steel, are first ground between two stones covered with fine sand and water. The uppermost stone is kept moving circularly; water is occasionally added, until the sand between has been completely powdered, resembling a slimy, creamy mass. The sand requires to be renewed until a perfect level is obtained. When stones are ground which have been already in use, this operation has to be continued until all traces of the former work have been thoroughly removed. Every particle of sand is now washed off with water; they are then polished with pumice-stone, and lastly with Water of Ayr stone.

The stones, which must be hard, for chalking, tinting, litho-tinting, and photo-lithography, require to be *grained*. After being ground in the manner already described, and then thoroughly washed, a finely-sifted silicious sand, or finely-ground glass, is put with some water between the two stones; and the upper one is made to revolve in short regular sweeps over every portion of the lower stone. This process must be continued for about ten or fifteen minutes, until a *grain* of the required fineness shall have been produced, and from time to time a few drops of water must be added to prevent the sand from becoming too adhesive, and thus *flattening* the grain. Great care and skill are necessary in nicely adjusting this process, so as to produce a grain either fine, sharp, or rough, according as it is intended for a sketch, for a highly-finished drawing, or for tinting. When grained as required, the stone is thoroughly cleansed with water, and left to dry.

The ink used for drawings on stone is composed of old lard, white soap, white wax, mastic, shell-lac, Venetian turpentine, carbonate of soda, and powdered Paris black.

Crayons are made of white wax, old hard white soap, tallow, a little shell-lac, and powdered Paris black. Some add more or less Brunswick black, so as to give a firmer point to the chalk. Lithographers vary in their modes of preparing writing-inks and chalks. White wax, however, together with soap and Paris black, will enable any practical litho-

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grapher to make a good ink and a good chalk. The method of mixing the different ingredients is by no means uniform. Some put into an iron or copper saucepan, the wax and half of the soap, which is put upon a good fire and stirred until ignition takes place; under the action of this stronger heat, the shell-lac is added, and melted into the mass. The vessel is then closed, and removed from the fire; after some time, the other half of the soap, and the other ingredients, are melted in over a slow fire. The powdered Paris black, together with the Venetian turpentine—if it be used at all—are then added to the mixture. While still hot, the composition is poured into brass moulds. Some, without setting fire to the mixture, make equally serviceable writing-inks and crayons. For harder and softer chalks a difference must be made in proportioning the ingredients. For soft chalk, for example, more tallow is required, and the shell-lac is either omitted, or much diminished in quantity. The ink used for writing on *transfer* paper requires no shell-lac, and, as a consequence, fire is not applied to the mixture.

Drawing and writing on the stone is accomplished by brushes of the finest camel-hair and steel pens.

After the drawing has been traced on the stone, of course in the reverse way, by fixing the tracing paper with the drawn lines next to the surface of the stone, the artist applies himself to his work with pen or brush, and scraper. The latter instrument is of different forms, and chiefly used for corrections; for example, when the artist finds some portion of the shading too strong, he crosses the lines with the scraper, just as the wood-engraver would do in similar circumstances; or a solid portion is filled in, and the scraper is used to bring out the effect in white lines. Or a portion may be taken out altogether, either by means of that instrument, or by oil of turpentine. A tooth-brush is sometimes used advantageously to give the whole drawing, or part of it, the effect of chalk. This is done by slightly warming the stone, and then pressing the tooth-brush, which is only slightly saturated with ink, against the blade of a table-knife, so as to spread a fine spray of dots, varying in size according to the strength used in pressing the brush against the knife. The effect of this under a practised hand is exceedingly pleasing. These imitations of chalk drawing have this advantage, that they admit of being printed by an ordinary printer, that they yield more copies per day than the chalk drawings, that they can be printed on any paper, and can easily be transferred to another stone.

The *tracing of chalk drawings* is done in the same manner as those with the pen or brush. Considerable practice is required in order to produce highly finished chalk drawings on the stone.

Great improvements have resulted from the practice of treating lithographic chalk drawings like paintings, with the systematic design of bringing out the chief effect, instead of copying simply the various details. This has been much facilitated in France and Germany by the use of paper, leather, and cork stumps, which catch up the chalk, pounded on a piece of grained stone slightly heated, and over which they are frequently moved. If the artist will take the trouble to try previously the various effects of texture which the stumps give, when worked gently, and with varying degrees of firmness, on the cold, as well as on slightly and well heated stones, he will be astonished at the variety of the textures which the impression will exhibit when finished with the crayon and scraper. This is well shown in the beautifully lithographed landscapes by Calame of Geneva, the works of Sabatier, Mouil-leron, Le Roux, and others of Paris, Munich, and Berlin. These stumped drawings require great judgment when being etched; but, in the hands of a careful printer, will give a larger number of impressions than ordinary chalk drawings.

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When the drawing is finished, it is laid in the etching-trough; nitric acid, diluted with water (say 1 part of acid to 100 parts of water), is several times poured over the stone. Dissolved gum-arabic is then spread over it. If the dissolved gum be mixed with the acid, the finest lines are not so suddenly attacked by the acid, and not so easily injured.

This process requires great care, and a rule for the proportion of the acid can scarcely be established, as it varies in strength and frequency of application, according to the style of drawing, hardness, and temperature of the stone, and quality of the chalk.

Engraving on stone.—A hard stone, gray or bluish, is etched first, with acid in the trough, and gummed (some do not etch, but merely gum the stone); when dry, the gum is washed off, and a mixture of powdered Paris black, with water and a very little gum, is spread over the stone, and smoothed down with a large flat camel-hair brush, or with the palm of the hand. Some prefer a red to a black ground. Where great precision is wanted, the black ground is preferable; but for free working of drawings, the red one is better. The red ground is applied by washing off the stone nearly the whole of the gum, after it has been etched, gummed, and dried. The small quantity of gum remaining on the stone is then allowed to dry, and powdered dry red, or red chalk, is rubbed on the stone with the palm of the hand. Black tracing-paper is required for the red ground, while on the black-grounded stone a red tracing-paper is required. The instruments for engraving on stone are fine and broad-pointed steel-gravers, fixed in holders of wood, and small points of diamonds properly fixed by the jeweller. The engraving is done, not like engraving on copper, but more in the manner of a careful drawing in pencil. It does not require to be cut very deeply. The drawing appears white on a dark ground. Any mistake may either be polished out with fine pumice-stone, or carefully taken out with the broad scraper; the spot is prepared afresh with acid, rubbed over with red chalk, and the engraving rectified. Smaller mistakes may be covered with a little weak phosphoric acid mixed with gum, and the lines so covered will not take on the printing-ink. When the drawing is finished, linseed oil is put over every line, and the whole is then cleaned away with water and a bit of coarse flannel. After the stone is thus freed from the ground and oil, a piece of coarse flannel, containing printing-ink, is rubbed over the whole stone, until every line appears distinctly in black, and then the stone is again gummed.

Engraving on stone is particularly suited for work where great minuteness and sharpness is essential. The maps of the survey of the Bavarian and other continental governments have been engraved on stone, as well as many of the beautiful maps of the survey of the Austrian staff, copies of the latter having been shown by the Austrian government at the Great Exhibition of 1851.

Etching on stone is similar to etching on copper. The stone, after it has been prepared with weak nitric acid, is, in the first instance, coated with gum, and allowed to dry. The gum is then washed off, but a little is retained on the stone. When again dry, the stone is warmed, and the etching ground is spread very thin over it. The working with the etching-point, and the etching with acid, are then done precisely as on copper. When the drawing is ready, clean water is poured repeatedly over the stone, which is afterwards washed in diluted acetic acid (wood vinegar), it is cleaned again with water, and allowed to dry thoroughly. After this, a roller with printing-ink is rolled over the dry stone until it is quite black. The whole is then removed with oil of turpentine and water, when the drawing appears in clean black lines, after which the stone is gummed. The printing is effected in the usual way with the printing-roller.

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Many beautiful drawings have been, and are yet, produced in Germany in this way; but somehow the style has never been extensively employed, from the many failures which are apt to occur during the first trials.

Autography on plain paper; Writings and Drawings on prepared lithographic paper.—Many government and banking offices, on the Continent and in Britain, produce their own circulars in the following simple way, which is properly called autography:—With very little lithographic ink in the pen, write only on one side of the paper (any good writing-paper may be used). When the writing is finished, a stone is slightly warmed, the written paper is sponged on the back with diluted nitric acid, and laid for a moment between blotting-paper; then the sheet is placed with the written side upon the stone, and passed *once* through the press. The sheet now adhering to the stone, is washed over with water on the back, and when the paper becomes quite soft, it is removed, by rubbing repeatedly with the hand. Gum is then put upon the stone; the printer takes a linen or flannel rag, containing some printing-ink, sprinkles water on the stone, and carries this rag rapidly in all directions over the writing, which now assumes a darker colour. The stone is then gummed again, and put aside until quite cooled. Before printing, some printers remove the gum, and pass a roller, containing what is called preserving-ink, several times over the writing, after which the stone is etched slightly; this, however, is scarcely needed where only a small number of impressions is to be taken.

The beautiful lithographic writings, plans, and sketches, on a coated lithographic paper, which are produced in Britain, and especially in Scotland, have never been equalled in other countries. The paper which is used should be well sized. The composition with which it should be covered is made as follows:—1 part gelatine or isinglass, 1 part flake-white, and as much gamboge as is needed to give colour, are dissolved over a slow fire, then sifted through muslin, and spread once, *in a very warm state*, with a large flat camel-hair brush, on one side of the paper. Some repeat the process. When dry, it should be passed several times through the press, over a polished stone slightly warmed, or better, a steel-plate, so as to be thoroughly smooth. Transparent quills and lithographic steel-pens are used for the writing. Any mistake is erased with a pen-knife, and the place covered again with the composition, of which the writer should have always a small corked bottle beside him.

When the drawing or writing is ready, it is put between damped blotting-paper, a warmed stone (not hot) is adjusted in the press, and after a few minutes the sheet of paper is placed upon the stone, and five or six times passed through the press; then the back of the paper is sponged with water, and the stone turned in the press; and with this change to compensate for inequalities of pressure, it is passed again five or six times through the press. This process may be repeated several times; and when it is finished, the back of the sheet is covered with water, and rubbed with the fingers until the portions of the paper come off. When the paper is entirely removed, the stone is subjected to the processes already given under "Autography."

Transfers from old engravings.—In Paris, a number of years ago, Paul Dupont made very interesting attempts to reproduce, by transferring to stone and zinc, old impressions of prints, woodcuts, type-printing, &c. The method is very simple. The old impression is thrown into a large flat basin filled with water, and a small portion of acid; and after it has been thoroughly soaked with the water, a small soft sponge containing lavender or nut-oil is repeatedly passed over the lines of the engraving, to strengthen the fatty portions of the dried up ink of the lines. The drawing is then transferred in the way already explained under "Transfer of Autography." Total failures, however, often

take place with this process, and even if the transfer succeeds, more or less touching is needed; and it is only when the engraving is not too fine, and a few years old, that a satisfactory transfer can be obtained. M. Dupont and others have spent large sums of money without producing practical and satisfactory results. Some recommend, for the transfer, zinc plates in preference to stone. The invention of Zincography is said to be due to the late Mr Eberhard of Bavaria. It is, however, a mere application of lithography to zinc plates, with some modifications of the etching, printing, &c.

Transfers of stone, copper, and steel engravings, as well as of type-printing and woodcuts, to stone, are best made on the usual transfer-paper already described. The ink for transferring drawings and writings from stone consists of a stick of lithographic ink, melted down on the slab, and thinned when required with a small quantity of oil of turpentine and some printing-ink. It is put upon the transfer roller, which is frequently moved over the slab. The gum being washed from the stone, and the old ink removed with oil of turpentine, the stone is wetted and inked with the transfer-ink, and the impressions are taken on very slightly damped transfer-paper. To make this paper, mix three parts of the best wheaten flour, of the consistency of shoemakers' paste, with one part of finely ground plaster of Paris, and a very little dissolved patent glue, to prevent the ground from breaking when printed; then strain the mixture in spoonfuls into a common jar through a double fold of fine muslin, pressing it gently through with the back of the spoon; and when cooled, spread it with a flat camel-hair brush over half-sized thickish paper, which, when dry, may be laid aside and stored for future use.

The ink used for making transfers from copper, steel, and pewter plates, is composed of two table-spoonfuls of varnish, $1\frac{1}{2}$ parts tallow, 3 parts brown soap, 5 parts shell-lac, 4 parts brown wax, 5 parts black pitch, and $2\frac{1}{2}$ parts of powdered lamp-black; the whole is melted and heated until it takes fire, and is allowed to burn for fifteen minutes, being kept altogether for forty minutes on the fire: it is then formed into sticks or balls, rolled with the hand; and should become, when cold, as hard as pitch. If not so hard, more wax and pitch should be added; some add a half part of Venetian turpentine when the wax is cooling.

The plates are then warmed on the printer's gas-stove, and inked up by the copper-plate printer in the usual way; the coated paper is slightly sponged on the back, and the impressions made on the coated side. A moderately warmed stone is then placed in the press; the transfer impression having been previously put between damped blotting-paper, is now put on the stone (yellow stones are better for transferring than gray or blue ones), and the transferring proceeded with in the same manner as described in the transferring of writings and drawings done with the pen on lithographic transfer-paper. If any of the lines on the engraved plate are very deeply cut, it is advisable to put the transfer impression, before being transferred, between some sheets of slightly damped blotting-paper, and pass it with a moderate pressure through the press. Thus, any superfluous ink will be removed, and the lines which may have too much ink are prevented from spreading.

Very striking results have been obtained by this process; and its value to publishers is well known, as the original plates are not worn out, and the expense of printing from the stone is cheaper than printing from copper and steel, besides being a great deal cleaner. Maps and engravings of any kind may, in this way, be patched or enlarged, or divided into separate pieces, to suit any size of book or paper. Transfers from copper-plates, from line-drawings on stone, writings, woodcuts, and letterpress, may all be transferred together on one stone, and printed on the same sheet. It is pretty obvious, that thus an infinite variety of

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new forms may be obtained from an exhausted stock of old plates, a circumstance occasionally of great value.

Tinted Lithographic Drawings.—For brevity's sake we shall only describe the production of drawings with two tints, as, from this description, the mode of printing a drawing with more tints will be easily understood. The principal drawing is done upon a grained stone in chalk, and should be very bold, more like a sketch on tinted paper; the middle and finer tints being left out. The stone is then etched, and two impressions are taken, so that when each of these is put upon a roughly-grained stone and passed through the press, counter impressions will be found upon the stones, revealing the drawing quite distinctly. After having cut in the outlines with a sharp-pointed graver or steel needle, the artist covers those parts on the two stones which are not to appear in the one or the other colour, as well as the margin of the two stones, with a brush containing acid and gum. The stones are then warmed, and a composition containing the same ingredients as soft chalk, with double the quantity of soap and three times the quantity of tallow, is rubbed over it with a bit of coarse flannel, until it is of a dark grayish-brown colour. From having been previously cut in, the outline comes out very distinctly. The artist can now produce an effect similar to crayon sketches which have been washed in with two separate colours. Those portions which have been rubbed in, and which appear dark grayish-brown, form the middle tint, and the scraper may be used to reduce the colour of the tint where the gradation of colour is desired; the darkest portions being laid in with lithographic ink, and the blending together done with chalk, brush, pen, and scraper, so as to produce in many places the effect of shadings of one colour over another. Any one looking at Louis Haghe's work on the *Architecture of the Middle Ages in Germany and the Netherlands*, Roberts' *Holy Land and Egypt* drawn by Haghe, or Simpson's drawings of the Crimean war, and the tinted lithographs of the British fleet, will understand the important and charming results of this branch of art in which Britain stands unrivalled. The stones, when ready, require to be very strongly etched.

We may mention that those studies of heads and figures as drawn by Jullien and Lasalle, of Paris, are tinted in a different style. An impression is taken from the drawing on stone, and passed, when fresh, over a roughly grained stone; then on the roller is put some light brown Brunswick black, or asphaltum, which must be worked on the slab until uniformly spread over the roller. The stone with the counter impression upon it, is, in a dry state, rolled over with the Brunswick black until the whole stone is covered with an even light-brown colour, through which the drawing is distinctly visible. After some hours, the covering becomes quite hard, and the artist can scrape out the lights of his drawing so as to give it the appearance of a crayon drawing which has been touched by a white crayon. The effect is very beautiful; and the two artists above mentioned stand pre-eminent for this style.

Chromo-Lithography is executed in a similar manner, with this difference, that the first drawing is generally only in outline, and is used merely to take as many impressions on stones as are required for the several colours of the painting to be copied, so as to bring out on each stone precisely the same outline, and thus to enable the artist to fill in on every stone the proper colour, and to enable the printer also to have proper register.

Presses, rollers, varnishes, &c.—Lithographic presses are of a great variety of construction, so that we can only glance at the chief points in their mechanism. The scraper is a wedge-formed plate of steel or boxwood, fixed to the bottom of the platten, with its edge downwards, and properly adjusted. The table on which the stone with the paper for receiving the impression is placed, and on which the tym-

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pan is brought down, is, by means of a handle or wheel, brought upon the metallic moving roller and under the scraper, and the pressure is gradually continued from one end of the stone to the other; when it has passed through the press, the scraper is lifted, the moving table brought to its original place, and the printed sheet removed.

The *Lithographic steam-press*, although a very ingenious invention, has not benefited lithography in the same proportion as the steam-letterpress has letterpress printing. The self-acting lithographic steam-press of Sichel, of Berlin and Vienna, patented in this country, is a triumph of ingenuity, but it has not produced any work which the common steam-letterpress could not have done as well.

The *rollers* for printing may be made of different lengths, from 6 to 24 inches long, and $3\frac{1}{2}$ to 5 inches in diameter. They are made of wood of the alder and lime tree, with wooden handles to project and hold by; the roller is then covered with several complete turns of flannel, well stretched and fastened by sewing at the extremities near the handles; the whole is then covered with calf-skin, sewed with great care, so as to fit tightly, and laced near the handles. For printing chalk, tints, and colours, skins of different preparations are required. Hollow metallic rollers, covered with flannel and calf-skin, are in use on some parts of the Continent, where they are preferred to rollers made of wood.

The best *varnishes* for making the printing-ink are boiled from old linseed oil, of different degrees of strength—thin, middle, strong, and very strong varnish;—for printing with gold-leaf, bronze, and dusting colours, the very strong varnish is required. For writings, maps, and music, common calcined lamp-black is ground with the varnish; some hard blue is added to improve the colour, and to make the ink dry in a short time; for chalk ink, Paris black is used instead of the common lamp-black. For *tinting and colour-printing*, colourless, or bleached varnish must be used, as otherwise the purity of the colours will suffer.

Printing.—After the stones containing the writings or drawings in chalk, and those used for tinting or colour-printing are etched, and the preparation has become dry, the stones may be put into the press and properly fixed. To prevent a stone containing drawings of any value from breaking, it should be backed to another stone,—or what is better, to a slab of Aberdeen granite. This is done by a mixture of plaster of Paris and cold water, of the consistency of syrup, a pretty thick coating of which should be spread evenly and quickly on the slab; the stone containing the drawing is placed into this layer, and moved in all directions until the plaster of Paris becomes quite hard, which will take place in a very short time. After the printing is accomplished, the stone can be quite easily removed from the slab, by using a chisel, and by giving some side strokes with a wooden hammer. The old dry plaster of Paris is now removed, and the slab is again fit for use.

Everything being ready, the gum is entirely washed away with a soft Turkey sponge and water; the writing or drawing is then obliterated by taking a clean sponge and oil of turpentine, to which may be added, at pleasure, a few drops of sweet oil, after which the stone must be cleaned with water. An entirely clean sponge (or for writings, a bit of soft canvas manufactured for the purpose) is now required for the printing. The stone is slightly wetted with this sponge, the printing roller, charged already with the proper ink, is passed repeatedly over the whole stone, and the writing or drawing will begin to reappear; the roller is again worked on the ink-slab, the stone wetted anew with the sponge, and again rolled over, until the writing or drawing appears in full strength. A sheet of damped paper (dry paper may be used for writings and drawings in line) is put on the stone, the tympan is let down, the scraper brought to its proper place, the pressure effected, and, by means of the handle, cross, or wheel, according to the style of

press, the table with the stone is slowly and equally drawn through to nearly the end of the stone, for which purpose the press requires to be set properly beforehand. The printer now relaxes the pressure, the table with the stone runs to its original place, the tympan is put back, and the impression is carefully taken up from the stone. The stone is then again wetted as before, inked in anew, the paper placed upon the stone, and further impressions are effected. When the stone is to be kept after the required number of impressions has been struck off, it should always be inked up with preserving ink, which is made by melting lard, tallow, and wax, in equal proportions, with a quantity of printing-ink. When about to be used, this preserving-ink may be thinned with some oil of turpentine, thinly spread on a roller kept for this purpose; it must then be properly turned on the slab, the writing or drawing is washed out with oil of turpentine, the whole removed with a clean sponge, and the stone wetted and inked in with this preserving-ink. A few minutes afterwards, when the turpentine has evaporated, a thin solution of gum-arabic is spread over the stone, containing a little sugar-candy to prevent the cracking of the gum by change of atmosphere. The stone will keep any length of time; but the preserving-ink should be renewed at least every twelve months.

The printing of tint and colour stones is treated in the same way, only the rollers, varnishes, and colours are different from those used for ordinary black and chalk printing. The printing of this class of work requires great skill and taste. Many of the lithographic printers of London, Paris, Brussels, Munich, Berlin, Vienna, and Dresden, are justly famed for their beautiful productions.

An engraved stone is printed by using a small wooden tapper or tampon, either round at the sides, flat below, with handle at top, or square, and the corners rounded off. This tampon is covered several times with a very coarse blanket, or coarse thick firm cloth fastened at the sides; the ink is then spread very thinly on the slab, the tapper is properly tapped into it, the gum is removed from the stone, and the drawing is removed with oil of turpen-

time; the stone is wetted, the tampon is tapped over the whole drawing, the stone cleaned with a bit of wet canvas, and finally a printing-roller is passed once or twice over the stone, which removes all impurities; a damped sheet of paper is placed on the stone, and the impression made as formerly explained. Some printers print engraved outlines or drawings done with thin lines entirely with the roller, which is a great saving of time. Other printers, again, ink an engraving with a large shoe-brush with long stiff bristles, which is rubbed on the ink slab to give it the ink required, by brushing over the drawing in all directions.

The only other branch of the subject requiring notice is the process of *Photo-lithography*, which is managed in the following manner:—Spread over a grained stone a solution of ether and bitumen of Judea, or asphaltum. When dry, lay the print or negative-photograph to be copied on the top of the stone, and then expose both in this way to the daylight for some time. Put the stone then in ether, which will dissolve off the stone the coating of bitumen on the parts that have been unaffected by the light under the dark parts of the print; whilst on the parts that have been acted on by the light, through the light parts of the print or negative, the bitumen having become insoluble, is undissolved, and when the stone is, in the next operation, placed by the lithographer under acid, in the usual way, these parts are protected from corrosion by the acid. The subsequent treatment is exactly similar to that of an ordinary chalk drawing. From the specimens which we have seen by photo-lithographers in Paris, Munich, and Rome, and from the very slow progress which has been made since their first impressions were exhibited a few years ago, few practitioners can hope, considering the difficulties of printing from stone, to see photo-lithography approach in their hands the perfection of those examples of photography exhibited at the Photographic Societies' Exhibitions of London and Edinburgh.

It is much to be desired, however, that some process may be invented for printing photographs with accuracy and facility.

LITHUANIA, a country of Europe, comprises the northern and larger portion of West Russia, and forms all the N. and N.E. part of the ancient kingdom of Poland. Area 112,000 square miles, and population about 5,000,000. It forms the present Russian governments of Wilna, Grodno, Minsk, Mohilew, and Vitepsk. The country is on the whole flat, and is for the most part covered with marshes and sand. The duchy of Samogitia and the banks of the Niemen, however, are fertile; the former of these producing a large quantity of flax. The mineral products are granite and pudding-stone; and iron is found, although in very small quantities. In winter the climate is excessively severe, while it is very hot in summer. Bears, wolves, elks, wild hogs, &c., abound in the forests; and the bison, or urochs, which occurs also in the Caucasus, may be found in the forest called Biala Vieja. The manufactures are of no importance, and the trade consists chiefly of exports of flax, timber, corn, wax, and honey.

In the *Chronicle* of Quedlinburg, A.D. 1009, we find mention is made of Lithuania; but little is known of it till the end of the twelfth century, when we find the inhabitants called "Lettoven." At a very early period they fell a prey to the Russians, who reduced them into a state of slavery and degradation. The consequence of this miserable condition was, that the Lithuanians had no decided position among the nations of Europe till the middle of the thirteenth century. At length, after long and bloody wars, they succeeded in gaining their independence; and, gradually encroaching on the Russian territories they extended their boundaries from the Niemen to the Dniester,

and from the Bug to the Dnieper. In 1230 Ringold assumed the title of Grand Duke of Lithuania. His son, Mendog, was baptized at Riga in 1252, but three years afterwards relapsed and became the sworn enemy of Christianity. Idolatry remained in the land for another century. The royal family became extinct with the death of Mendog's son in 1266, and Witenes, a young man about the court, succeeded in placing himself on the throne in 1282. He was succeeded by his son Ghedemin in 1315, who did more for his country than any of his predecessors, both by extending his conquests and preserving the religion, language, and customs of the inhabitants of the lands which he subdued. His son Olgerd, on his deathbed in 1381, at the instigation of his wife, became a member of the Greek Church. From Olgerd the power passed into the hands of Jagello, one of his younger sons; and on condition of his becoming a Christian, and of Lithuania being united to Poland, he received Hedvig the Queen of Poland in marriage. Jagello, together with all his brothers and sisters, and many of the nobles of his court, was publicly baptized in Krakau on the 14th of February 1386, and shortly afterwards was solemnly crowned King of Poland. In the following year he changed the magnificent heathen temple at Wilna into a Christian church, and at once induced thousands of his subjects to receive the Christian religion. From many circumstances, however, the real political union between Lithuania and Poland took place only gradually, although it had been formally declared at Wilna. Properly speaking, the union was not thoroughly established till the Diet of Lublin in 1569. Before Lithuania was annexed to

Litmus Russia, it had the following divisions:—Troki, Wilna, Novogrodek, Bzesk, Vitepsk, Polozk, Mohilew, and the duchy of Samogitia. In 1792 Russia took Mohilew and Polozk, and in 1793 the rest of the country.

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LITMUS, or **LACMUS**. Lichens belonging to the genera *Roccella*, *Variolaria*, and *Lecanora* furnish the red, violet, and blue colours, commonly known as *archil*, *cudbear*, and *litmus*. The colouring matter does not exist ready formed in the lichens, but they contain from 7 to 12 per cent. of certain colourless acids, such as *erythric*, *evernic*, and *lecanoric*, which acids, when acted on by alkalies, form new acids, and these, on the addition of an alkali, produce a violet colour, and also a colourless neutral substance termed *orcin*. This is the colour-producing body; and when acted on by ammonia, it absorbs oxygen, and is converted into *orcein*, an azotized body with powerful tinctorial properties.

In preparing *archil*, *cudbear*, or *litmus*, the lichens are first cleaned from earthy matter, and are then made up into a paste with an alkaline solution, which in the case of *archil* is urine, with the addition of lime for separating the ammonia. By exposure for some weeks to the air, with occasional additions of the alkaline liquor, the paste assumes the characteristic colour of the lichen used. In this way *cudbear* is obtained from *Lecanora tartarea*, and *litmus* from the *Roccella tinctoria*; but in the latter case it is moistened with a mixture of carbonate of ammonia and carbonate of potash, and the colour is first red, and afterwards intensely blue. It is made up into small cakes, with chalk or plaster of Paris. The colouring matter of *litmus* is soluble in alkaline liquids, but only partially so in water and in alcohol. According to Kane, *litmus* consists of several principles, one of which is a red semi-solid body, soluble in ammonia with a purple colour, and termed *erythroleine*; secondly, a body named *erythrolitmin*, which forms crystalline grains of a dark red colour, and is soluble in alcohol, but not in ether; it becomes blue by the action of potash. Neither of these bodies contains nitrogen, but the third and chief component of *litmus* does so, and hence has been termed *azolitmin*. It is not soluble in alcohol or in ether, and only sparingly so in water; it has a brownish-red colour. It is soluble in ammonia, when its colour becomes blue; and when this solution is mixed with the salts of some of the metals, blue and violet lakes are formed.

Litmus is much used by the chemist for detecting the presence of acids, which turn it red; the blue colour is restored by the action of alkalies, so that when slightly red-dened, it may be employed as a test of their presence. The most convenient method of applying the test is by means of strips of unsized paper, tinged by an aqueous solution of *litmus*, and then dried. (C. T.)

LITTLE ROCK, a town of the United States of North America, capital of Pulaski county, and of the state of Arkansas, is situate on the right bank of the Arkansas River, in the centre of the state. It stands on a bold cliff about 50 feet high, which is the more prominent as it is the first rock met with in ascending the stream. The chief buildings of the town are—the state-house, made of rough cast brick, an arsenal, and penitentiary, besides several churches and seminaries. Excellent clay-slate and granite abound in the neighbourhood. *Little Rock* was founded in 1829. Pop. (1850) 2167, (1853) about 3000.

LITTLETON, SIR THOMAS, a famous judge, born about the beginning of the fifteenth century, was the eldest son of Thomas Westcote, Esq., of Devonshire, and the grandson, by his mother's side, of Thomas Littleton, Esq. of Frankley, in Worcestershire, whose name and arms he assumed. He was educated at one of the universities (probably Cambridge), and removing to the Inner Temple, London, became one of the readers to that society. Henry VI. appointed him steward or judge of the court of the palace, or marshalsea of the king's household; and on the

13th May 1455, king's serjeant. In this latter capacity being also a judge of assize, he travelled the northern circuit. His prudent conduct, and his high fame as a lawyer, secured the patronage alike of the Lancasterians and the Yorkists during their protracted struggle; and Edward IV., in 1462, the second year of his reign, tendered him a general pardon, and confirmed to him his offices of king's serjeant and judge of assize. In 1466, he was appointed one of the judges of the Common Pleas, and obtained a writ directed to the Commissioners of Customs for the ports of London, Bristol, and Kingston-upon-Hull, for the annual payment of 110 marks, to support his position, and of other small contributions to supply him with robes. In 1475 he was created, along with many of the first nobility, a Knight of the Order of the Bath. He died at Frankley on the 23d of August 1481, at an advanced age, and was buried in Worcester Cathedral, where a tomb, surmounted by a statue, was erected to his memory.

His famous work on *Tenures*, written in Norman French, is supposed to have been composed while he was judge of the Common Pleas, and to have been printed after the author's death, but at what date is uncertain. After passing through several French editions, it was published in English in 1539. Sir Edward Coke wrote a comment upon it, now well known by the title "*Coke upon Littleton*."

LITURGY is derived from a Greek word denoting the public service which citizens were bound to render to the state on certain prescribed occasions, but which is used in the Septuagint to express the public service of God. Liturgies may be of three kinds. Either they may form an *imposed* ritual, responsive in its character, and prescribed absolutely to minister and people for their invariable use, as is the practice in the Anglican and Lutheran amongst the Reformed churches; or they may take the form of a *discretionary* ritual, not responsive, and therefore supplied, as in France and Switzerland, to the minister alone, for his guidance in the matter and manner of worship, leaving variation as to the manner according to his judgment. This was the practice in the Church of Scotland during nearly a century of its existence, and it is retained in the Reformed churches of the Continent. The third method is that of *rubrical* provision, consisting of directions without examples, and omitting any precise forms of prayer. Of this character is the *Directory for Public Worship*, composed by the Westminster Assembly, which now forms the rule of worship in Presbyterian churches of Scotland and America. A fourth method of public worship—if there be such where no method exists—is that of entire freedom, such as has been claimed by some denominations since the days of the older Independents, who denounced all forms, as hampering the liberty of the individual. The expediency of any of these methods has been the subject of much and angry discussion at all the most decisive epochs of ecclesiastical history, and in this article we propose to limit ourselves to a short historical view of the various liturgies in the different sections of the Christian Church.

Amongst the Israelites, certain forms of prayer and praise seem to have been used from the earliest times. So far as we know directly from the Old Testament, the earliest prescribed forms were those according to which the priests were commissioned to bless the people, and the forms of prayer in presenting the first fruits and tithes. The Psalms of David also constituted a public liturgy; and some have argued from the metrical forms of various public prayers inserted in the record of Jewish history, that these also belonged to a prescribed service. The modern prayers of the Jews, however, many of which are attributed to the pen of Ezra, are certainly of far more recent date. They are only nineteen in number, and most, if not all, are later than the establishment of Christianity. That men were "taught to pray" in the days of our Saviour, seems evident from the

Liturgy.

Liturgy. circumstances which gave rise to the promulgation of the Lord's Prayer, and, whatever may have been the design of that formula, it is certain that it soon came to be used as a prescribed form in the Christian Church. (See Wheatley's *Illustration of the Book of Common Prayer*, and also compare Hind's *Rise and Progress of Christianity*.) From the incident in Acts iv. 24, it may be gathered that large masses of converts were able to join vocally in public supplication. In the earliest times of the Church, frequent reference is made to certain constituted prayers in general use (see Comber's *Scholastic History of Liturgies*), but in general these extended no further than to individual churches, and were arranged for local use by the ruling presbyter or bishop. Gradually, however, these spread from the metropolitan churches to the rural districts, and ultimately they became divided into great classes of national liturgies. Mr Palmer, in his *Origines Liturgicæ* (Oxford 1832), considers that all the liturgies of the primitive churches may be reduced to four: 1st, The great Oriental liturgy, which prevailed from the Euphrates to the Hellespont, and from the Hellespont to the southern extremity of Greece; 2d, The Alexandrian, which from remote antiquity has been the liturgy of Egypt, Abyssinia, and the country extending from the Mediterranean Sea towards the W. 3d, The Roman, which prevailed throughout the whole of Italy, Sicily, and the civil diocese of Africa; and 4th, The Gallican, which was used throughout Gaul and Spain, and probably in the exarchate of Ephesus until the fourth century. These, in the course of ages, were endlessly varied and diversified. From the whole history of these, it seems evident that there never was one catholic liturgy; that none of the liturgies now existing can be traced back to the apostles; but that formal prayers of some sort were used from the very beginning of the Christian Church. The Greek Church, at least so far as it is under the dominion of the Patriarch of Constantinople, possesses three liturgies, which are used at different seasons of the ecclesiastical year. That of Basil of Cæsarea is the longest, and holds pre-eminence in solemnity, as it is said also to do in point of antiquity. It is reserved for the most solemn festivals of the church,—Christmas, Lent, and Good Friday,—as well as for a few other occasions. The second bears very undeservedly the name of Chrysostom, being considerably later than his days. It is read on all the other days of the year except during a few days in Lent, when the *Liturgy of the Presanctified*, a composition of the seventh or eighth century, takes its place.

Amongst the Eastern sects a characteristic variety of liturgies prevails. The ancient Coptic Christians had as many as twelve different forms, and these still linger among the Ethiopians. They were,—1. *The Liturgy of St John the Evangelist*; 2. *Of the Fathers of the Council of Nice*; 3. *Of Epiphanius*; 4. *Of St James of Sarug*; 5. *Of St John Chrysostom*; 6. *Of Jesus Christ*; 7. *Of the Apostles*; 8. *Of St Cyriac*; 9. *Of St Gregory*; 10. *Of the Patriarch Dioscorus*; 11. *Of St Basil*; and, 12. *Of St Cyril*. Amongst the Copts, however, all the minor liturgies fell into abeyance, being discountenanced by the patriarchs; and the usage of the church came to be limited to the liturgies of Basil, Gregory, and Cyril. Amongst the Syrian Catholics, the Liturgy of St James is preferred, but numerous others are also found in use.

The *Breviary* contains the daily service in the Church of Rome. Originally it contained only the Lord's Prayer, with extracts from the Psalms, to which, very soon after, were added lessons from the Scriptures. The obligation to read it daily rests upon the beneficiary clergy alone; but on them it is imposed under pain of mortal sin. Although read only in Latin in the churches immediately depending on the Holy See, fragments of it have found their way into the vernacular of eastern tribes who at one time were in

close connection with Rome. Besides the *Breviary*, there is also the *Missal*, or volume regulating the celebration of mass. A tradition of the Romish Church ascribes its composition to the apostle Peter, but it does not appear to have been reduced to writing till the middle of the fifth century, and it owes much of its present matter, as well as nearly all its present form, to the genius of Pope Gregory the Great. The *Ceremoniale* may be designated a liturgy for the pope, embracing all that pertains to the various functions of his office, just as the *Pontificale* describes the various functions of the Romish bishops, and the *Rituale*, or *Pastorale* as it is sometimes called, contains directions for all the pastoral duties of the inferior clergy. The ancient *Gallican Missal* dates from beyond the days of Pepin, and is more closely allied to the liturgies of the East than to that of the Latin Church. The old *Spanish* or *Mozarabic Liturgy* consisted of the liturgy of Rome, mingled with the oriental liturgies of the Arian Goths, who overran the kingdom. Its use was suspended by the Council of Braga; and it was only saved from oblivion by Cardinal Ximenes, who reprinted it in 1500, and endowed a chapel and canons to use it daily in Toledo. The *Ambrosian Liturgy* is one of great antiquity, having been only edited and supplemented by the bishop whose name it bears.

The liturgies of the Reformed Churches are all compiled in the vernacular, the use of the Latin tongue having been abolished in worship as soon as it came to be recognised that adoration demanded intelligence. Luther, in 1523, drew up a liturgy for the use of the German Church; but as he had no desire to impose this as a form on all who held the same doctrinal views with himself, all the Lutheran countries have Lutheran liturgies of their own; but these agree in almost every essential particular. In Prussia, the form generally adopted is that drawn up in 1822, for the use of the cathedral church in Berlin. Calvin also drew up a liturgy, for the use of the Reformed Church of Geneva and elsewhere. The Genevan formula was published in 1543, six years before the first book of Edward VI., and while it retained many parts of Christian service which Calvinists now dispense with, it was the first to originate the idea of making the singing of psalms take the place of the vocal response on the part of the people. In its nature it was intended to be compulsory, but a provision was made for extemporaneous prayer and for special prayers on particular occasions. Calvin's *Daily Offices* were also composed as directions for family prayer; and these are used as a form of morning and evening prayer in several branches of the Reformed Church. In France, the Genevan liturgy long retained its hold supreme in the affections of the people. It was used in the earliest meetings of the Reformed congregations after their organization in 1555; and the last synod or national assembly of the French churches in 1569 issued instructions for preserving its purity. Various modifications have been made on it since the restoration of the Protestant worship, and new prayers have been introduced from other sources, in effect destroying its venerable character. In Scotland, although the liturgy had a short existence in the national church, yet during its continuance in use, it seemed in no way to offend the feelings of the people. John Knox died repeating the words of Calvin's *Daily Offices*. In 1562 was introduced the *Book of Common Order*, commonly termed *Knox's Liturgy*; and two years later its use was enjoined upon the Church by the General Assembly. It was drawn up after the model of the Genevan formulary, and was mainly intended for the readers and exhorters; although even they were invited to avail themselves of the latitude recommended to all the clergy. It is difficult to fix the precise period when the liturgy ceased to be used, but it perished when Knox's overshadowing greatness ceased to influence the practice of the Church. At present the

Liturgy.

Liverpool. worship of the Presbyterian churches in Scotland is guided by the *Directory for Public Worship*, issued by the Westminster Assembly, which contains directions, but no forms of prayer; but it is scarcely too much to say that in general throughout Scotland, the provisions of the *Directory* are almost entirely forgotten.

In England the *Book of Common Prayer* forms the liturgy of the Established Church. It is founded on the *King's Primer*, published by Henry VIII. in 1546; which, however, contained little more than the Creed, Lord's Prayer, Commandments, and Litany. This, during the reign of Edward VI., underwent two separate revisions, and the *Second Prayer Book of Edward VI.* approaches very nearly to the liturgy of the present day. After having been discontinued during the reign of Mary, it was again revived with the reign of Elizabeth, and received further improvements, especially in the selection of the lessons. Some alterations were introduced during the reign of James I., and consisted chiefly in the appointment of a

collect in the daily morning and evening service; the insertion of a prayer for the Royal Family in the Litany; and addition of questions and answers in regard to the Sacraments in the *Catechism*. In 1662 it was revised by both Houses of Convocation, and was sanctioned by act of parliament in its present form. The liturgy of the Scottish Episcopal Church has been, since 1712, the same with the *Book of Common Prayer*; with as little variation as circumstances will admit, except in regard to the Communion Office.

Of Dissenting liturgies, it is perhaps only necessary to mention Dr Samuel Clarke's *Reformed Liturgy*; the *Sunday Service* of the Wesleyan Methodists, prepared originally by John Wesley; and, on the Continent, the *Liturgy of the Unitas Fratrum* or Moravian Brethren.

See Kœcher's *Bibliotheca Liturgica*; Bingham's *Ecclesiastical Antiquities*; Adams' *Religious World Displayed*; Palmer's *Origines Liturgica*; and Baird's *Chapter on Liturgies*.

LIVERPOOL,

A BOROUGH of England, in Lancashire, and one of the greatest commercial towns in the world, is situate on the Mersey, along which it extends for nearly 6 miles. For 5 miles of this distance, a line or chain of docks runs parallel with the river, and from these docks, at intervals, streets extend at right angles, tolerably direct, to the extremity of the boundary. These are crossed by streets more or less parallel to the river; but as the town grew up rather suddenly, no great attention was paid to regularity. The boundary line, from where it touches the river at the S. to its termination at Bootle Bay, embraces a circle of about 8 miles. As yet the extremities are imperfectly filled up, but in some places the houses extend beyond the line.

History.

Local archaeologists have been eager to invest the town with the dignity of a remote antiquity; but their labours have not been very successful. In *Doomsday Book* the name does not appear, although sites within its present boundary are mentioned. Mr Picton, in his admirable paper on "Ancient Liverpool," contends that the place mentioned as *Smedone* must have represented Liverpool, and that *Smedone* is identical with Smithdown, now one of the southern streets. This, however, is not likely, for Smithdown was remote from ancient Liverpool, and on the south side of the Pool, then called Mersey Sea. The name has been a subject of unsatisfying contention; for although the final syllable *pool* is derived from the locality, *liver* is of doubtful origin. In early times the town was called indifferently *Lirpool*, *Litherpool*, *Lithpool*, and *Liferpole*. *F* and *v* were commutable; but, in the most ancient records, the name is written indifferently *Lithepol* and *Lithpole*. Mr Baines, in his *History of Liverpool*, is disposed to think that *lithe* must be accepted for sea, and thus the derivation will be the pool on the sea. Originally the place was only a small fishing village; for the Mersey, up to a very recent period, was remarkable for its supply of salmon and other fish. The first authentic record of the town is found in a charter of Henry II., in the year 1173, declaring that the estuary of "the Mersey shall be for ever a port endowed with all the liberties belonging to a port of the sea, and that the men of Lyrpul, near to Toxteth, may come and go from each side of the sea with their ships and merchandise free and without obstruction." It is supposed that his majesty, in this charter, had reference to the conquest of Ireland; for, not content with the bestowal of a barren privilege, he actually erected dwellings called burgage houses, the tenants of which were the primitive freemen of Liverpool. These houses con-

tinued to yield a rental to the crown up to the time of Elizabeth, and constituted, to a great extent, the dwellings of the inhabitants. In 1207 King John granted the town a charter, as follows:—

"Know ye, that we have granted to all our faithful subjects who have taken burgage houses at Liverpool, that they may have all the liberties and free customs in the town of Liverpool which any other free borough upon the sea has in our territories. And, therefore, we command you, that, securely and in our peace, you may come thither to receive and dwell in our burgage houses; in witness whereof, we transmit to you these our letters patent. Witness—Simon de Pateshill, at Winchester, the 28th day of August, in the 9th year of our reign."

On the apex of the promontory of some 40 or 50 feet above the river, a castle was erected at a very early period. Its erection is ascribed to King John, but it is supposed to have existed, in some form or other, before his time. The king subsequently granted the site of Liverpool to Fitzwarine, but it reverted, in the next reign, again to the crown. The "free customs" of the charter mean exemption from the petty customs; and thus, from that time to this, the freemen have been exempt from the payment of small dues. Henry III. extended their privilege by exempting them from tolls in all the ports of the kingdom; but all merchants frequenting the port of Liverpool were bound to pay due customs. Immediately after granting this charter, King Henry farmed the town to the freemen at L.10 per annum. Charters and privileges at that time, however, were easily set aside or violated with impunity; but from the reign of King John to that of Charles II., the crown claimed a right to these dues, and farmed them to various persons. In 1399 John of Gaunt leased the dues and all other profits, arising as well by sea as by land, for 57 marks. From that period the duchy of Lancaster became attached to the crown, and consequently all grants proceeded from the same source. A fee-farm of the town was let to various persons—at one time to the people of the town, at others to individuals; but in 1466 the value had increased to only about L.14 a-year. In 1528 it was estimated at not a greater value. A few years afterwards Henry VIII. considered that he had been defrauded by the corporation, and appointed an inquisition for investigating the matter. There was some reason for this, for the freedom of the town was granted to foreign merchants on the payment of a certain sum, which sum relieved them from the burthen of town-dues. The corporation, such as it was, also exer-

Liverpool. cised a monopoly, and excluded from trade in the town all who were not members of their municipal body. This, however, had but little effect in retarding the progress of the place; for, notwithstanding the favours of the crown, its prosperity positively declined from the thirteenth to the sixteenth century, from causes quite apart from local or royal measures. In 1346 there were 168 burgages, held at the rate of 12 pence annually; in 1429 these had been reduced to 148; and in the reign of Elizabeth, in 1655, they had fallen off to 138. The population may, therefore, be set down, at the last named period, as about 1000. So poor was the place that for 200 years it returned no member to parliament. The population nestled about the castle, forming no continuous street, but lining, at intervals, the roads or pathways, which were not paved before the fourteenth century. The first palpable step in advance taken by the town was in the reign of Charles II. A new world had then been opened to the enterprise of the old; and Liverpool invited to its port such trade as was created by the infant manufactures of Lancashire, Yorkshire, and Cheshire. As the plantations in America increased so did the trade of Liverpool; and from an early period her merchants took a prominent part in the slave trade. She sent out ships to Africa, conveyed their live burdens to America and the West Indies, and in return brought back to the Mersey the sugar, tobacco, and other produce of those regions. The English merchants and shipowners had competed successfully with the Spaniards and Portuguese; but it was not until 1708 that the first slaver was despatched from the Mersey. Having entered on the trade, they soon participated largely in it; for, in 1752, 101 Liverpool merchants were engaged in the slave traffic, 135 appertaining to London, and 157 to Bristol. The number of Liverpool vessels engaged in the American and West India trade was 106, and of these 88 were slavers. In due time this trade greatly increased; and that it enriched Liverpool may be inferred from the fact that the greater portion of the West Indies belonged to merchants of this place. This trade, however, like every other, was affected by war. It almost ceased during the French war of the eighteenth century, and the merchant ships unemployed were eagerly converted into privateers. At first the gain was immense; but subsequently the French predominated, and Liverpool suffered severely by the privateers of the enemy. On the return of peace, trade was resumed, but not with any accelerated force until the inventions of Arkwright and others created the cotton trade in Lancashire. The war of American Independence had the worst possible effect on the prosperity of Liverpool; and the late war of the French Revolution at first operated most adversely. Still, two circumstances obviated these bad effects. The great increase of population and trade in the United States of America created a demand for British manufactures, and these manufactures had nearly all to pass from the Mersey, which received in return the raw produce indirectly paid for them. At the close of the war Liverpool was still advancing, but not so rapidly as within the last 25 years.

Trade of
the port.

In 1750 Liverpool had only 20 sailing vessels engaged in the continental trade; now she has treble that number, and fleets of screw steamers, which constantly visit every port in the Mediterranean, and render the Mersey a medium of communication between France, Holland, Belgium, and America. The East Indies, too, have been opened to Liverpool enterprise. Since the alteration in the Company's charter, and in the amount of business done in the East, Liverpool stands next to London. Another trade she has almost monopolized—the Australian trade. Her clipper vessels are admitted to be the finest in the world, and, in consequence, the emigration to the antipodes is the largest

from this port, and the return cargoes the heaviest; for necessarily the freights are low, as more goods go than come, and cheapness induces shippers to send their wool here rather than to London, although London is the principal market. But Liverpool is now creating a wool market of her own.

The first authentic account of the number of vessels entering the port dates from 1577; and the following returns indicate at a glance the progress of the trade:—

Years.	Vessels.	Tonnage.	Dock Duties.
1757.....	1,371	...	L.2,336
1780.....	2,261	...	3,528
1800.....	4,746	450,000	23,379
1820.....	7,277	805,033	94,412
1830.....	11,214	1,411,964	151,359
1840.....	15,998	2,445,708	178,196
1850.....	20,457	3,536,337	211,743
1856.....	20,886	4,320,618	326,801

The custom-house revenue collected in the port was, in 1855, L.3,576,344, 2s. 8d., and 1856, L.3,824,177, 14s. 8d.; showing an increase of L.247,843, 12s. The last quarter of 1856 exhibits a comparatively further increase of L.118,581 over the corresponding quarter of 1855. The town dues now produce more than L.120,000 a-year, and there is another impost called light-dues, which produced in 1856 L.99,965, against L.86,182 in 1855. These light dues go altogether to the Board of Trade, and are disposed of as passing tolls. The greater number of vessels frequenting the port comes from the United States of America; for the great trade of Liverpool is in cotton, and the cotton supplied comes in largest quantities from the southern states of the Union. The following returns will give a correct idea of the progress of this trade. In 1770 there were imported into Liverpool 6037 bags 3 bales 3 barrels of raw cotton; but since the improvements of Hargreaves and Arkwright in spinning, the trade has greatly increased. Thus the importation was, in—

	lb.		lb.
1780.....	6,766,613	1830.....	261,961,452
1800.....	56,010,732	1840.....	583,400,000
1820.....	143,672,655	1850.....	685,600,000

In 1856 there were imported into Liverpool 2,028,850 bales of cotton.

A large trade is carried on in flour, grain, and corn. The imports of these in 1856 were—

Wheat, qrs. 1,370,152	Flour, sacks, .....232,704
Corn, do....897,407	Do. barrels,....1,138,260

Two-thirds of all this comes from America. The quantity re-exported is small. The total sugar imported in 1856 was 76,000 tons, of which 17,840 tons were from the British West India plantations, 18,555 from Bengal, and 19,996 from Brazil.

For carrying on a trade so large great facilities are afforded. In 1715 the first dock was constructed with an area of three acres and a half. This sufficed for forty-two years; but, at an interval of eighteen years, another dock appeared, and within a period of fifty years five additional docks were made. In 1826 the corporation filled up the primitive dock in order to erect the custom-house on its site. In consequence of this proceeding, and the rapid increase of buildings, none of the docks run inland, but all extend along and parallel with the river. From 1830 to 1842, eight new docks were opened; and from 1845 to 1852, not less than fourteen docks and basins have been added. The total water space afforded by the docks is 200 acres; and the quays measure 14 miles in length. The river wall is 5 miles 200 yards long; the total area of the dock estate is 712 acres.

No other port can present anything to be compared with the Liverpool Docks. One serious inconvenience however is, that running along the river wall, they interrupt the ap-

¹ This is the first year when goods were rated as well as ships.

Liverpool. proaches to the ferries, and when the gates are open, stop intercourse for a short time altogether. To remedy this an immense landing stage, constructed by Mr Cubitt, has been placed at St George's Pier, and this has not only promoted the comfort of passengers, but served as a very popular promenade. Another landing-stage has been constructed three times the size of the former one, at a cost of L.150,000. Means, too, are under consideration for facilitating approach to the ferries.

Until 1826 there were few warehouses on the dock quays. The warehouses are in general up the town, or at some distance from the quays. The inconvenience of this provoked a lively agitation among the merchants, and, through the great exertion of several members of the council, the Albert Dock was constructed and surrounded, like St Katherine's Dock, London, by piles of ponderous warehouses. Stanley Dock has since also been surrounded by warehouses, and the new Wapping Docks are to have the same advantage.

Extensive as the dock accommodation is, it is no longer adequate to the wants of the port. Several new docks are projected at the N. end, on land reclaimed from the bay, under a certain understanding with the Earl of Derby; and in 1854, the corporation became purchasers of the Birkenhead Dock and estates for a sum of L.1,143,000. But these docks, to be rendered available, will require a further outlay of L.800,000.

The constitution of the dock management has undergone some changes. The corporation having been the first projectors and supporters of the docks, were recognised as trustees of the estate. Under the act 51st George III. the committee consisted of twenty-one persons, all members of and appointed by the common council, and this continued until the passing of the act 6th George IV. 1825, when the dock ratepayers were first directly represented by returning eight members to the committee; the council electing thirteen, including the chairman, and the council having a veto on the proceedings. This continued until the act of 1851, by which a committee of twenty-four is appointed—twelve by the council, and twelve by the dock ratepayers. The committee appoint their own chairman and deputy-chairman; the chairman being, however, one of the twelve members elected by the council. The council have also a veto on the proceedings of the committee by a majority of two-thirds.

The care of the port is divided between the dock committee and the corporation. The latter constructed the lighthouse and built the Wallasey embankment, to prevent the sea encroaching on the district and impairing the channels leading to the river; and the former provide buoys, and a marine surveyor whose duty it is to note the shifting of the sandbanks, and give notice to the pilots and mariners.

Ship-building. There are several eminent ship-builders in Liverpool, but of late the greater part of the trade has been in repairing and in the building of iron ships. There are five building-yards on the Lancashire side of the river, and three on the other side. Those on the Cheshire side combine graving with building docks, and, although there are several graving docks on the Liverpool side, they are found to be inadequate to the wants of the port. As might be expected, a large trade is carried on in ships. In 1856, 694 ships of 328,991 tons were sold, and of these one-fifth were bought by foreigners.

Manufactures. Liverpool is a place of trade rather than of manufactures, and those manufactures which exist are more for the supply of local wants than for general purposes. An attempt was made to establish a cotton manufactory, but without success.

Political and social. The origin of the corporation, as we have already shown, was sufficiently humble. Deficient in strength itself, it sought to borrow power from neighbouring greatness, and of course shared the usual fate of dependants. When the

house of Molyneux proved unkind, the corporation became the client of that of Stanley; but to the former family it seemed most attached. Against both patrons it occasionally played off the chancellor of the duchy. When compelled or disposed to send representatives to Parliament, it sometimes ventured to nominate one, leaving a blank to be filled up by the predominant power of the day. There was, however, in the sixteenth and seventeenth centuries, a partial growth of independence. Individuals acquired wealth; out of riches grew local rivalry; and small enmities were as violent then as at a later period. The corporation was not at first perplexed by forms; all the burgesses assembled at the Market Cross, until the number claiming to be present proved rather too numerous. A common council was then resorted to, but in time this became self-elected. The freemen, until about 1820, retained the right of electing the mayor, but subsequently this was a mere formality. The council filled up the blanks left in their ranks by death or resignation, until 1836, when the Municipal Reform Act restored the body to popular election. In the earlier days of the corporation, heads of the houses of Stanley and Molyneux frequently filled the civic chair, the duty no doubt being performed by deputy. The corporation having been always dependent on the Crown, acquired a sentiment of loyalty which is still discovered in a customary toast at the mayor's table. In the civil wars, the town suffered from three sieges, but it had not much to lose. To the house of Hanover it paid marked devotion, and up to 1836 the predominant feeling in the council was Toryism. The new act divided the town into sixteen wards, and gave to each ward three members and one alderman. At the first election the liberals prevailed, but in a few years the opposite party obtained a majority, and have kept it ever since.

Before the Reform Bill, freemen only could vote for a member of parliament; but as their number was large, frequent and violent contests took place. With one or two exceptions, however, Tory candidates were returned. Mr Brougham, now Lord Brougham, contested the borough with Mr Canning, but lost the election. The freemen being artizans, dependent on the West India and other great interests, were necessarily exposed to certain influences, but in the end nearly all became venal; and at the election of 1830, the friends of the adverse candidates, Mr Ewart and Mr Denison, it is alleged, spent L.150,000. This great scandal hastened the reform measure. The Reform Bill continued the privilege of voting to the freemen, and, as usual, they aided the Conservative side. Under the provision of the act, however, their numbers are fast decreasing, and even now a contest is doubtful.

Next to London, the corporation of Liverpool is decidedly the richest in the kingdom. At first her income was miserably small, and centuries passed without improving it; but in 1777 the corporation purchased from Lord Molyneux, for L.2250, his reversion, expectant on the determination of his lease in the town dues, and these rose gradually from L.20,000 a-year to L.120,000. The income of the corporation is also derived from land within the town, from markets, and from police rates; the whole estimated at L.268,000 for 1857. The claim to the town dues has often been questioned. A case was tried in the Court of King's Bench in 1831, and decided in favour of the corporation; but in 1856 Government brought in a bill to abolish them. Great resistance being offered, a select committee was appointed; it heard evidence, but made no report. The people of Manchester are opposed to these dues, and it is believed that ultimately there must be a compromise. The dues consist of small sums, hardly appreciable in amount, collected on merchandise. The dock-rates belong to no special interest, being devoted not to demands, but simply to interest of money borrowed, and the cost of working.

Liverpool.

With the increase of trade and wealth the mode of doing business underwent a great change. At the beginning of the present century the merchant had his counting-house and warehouse behind his dwelling-house. These mansions may now be seen in Hanover Street, Duke Street, Seel Street, and others, bearing still in their architecture evidence of cost and taste, although now mostly devoted to meaner uses. Thirty years later the mercantile offices began to gather about the Exchange; mean buildings were transformed into lordly edifices; and as much as L.600 or L.800 a-year is now (1857) paid for a suite of rooms on a single floor. Such rents are, of course, temptations to an increase of buildings; and in 1856 as much as L.47 a square yard has been paid for building land near the town-hall. All the opulent classes live in the environs. Up to the year 1833 New Brighton was a sand-hill, without a single tenement on it; now it is covered with villas. The villas cover the hills and crowd the gorges, which extend from the Red Noses to Rock Ferry; while on the Lancashire side, Aigburth, Allerton, Woolton, Wavertree, Old Swan, Knotty Ash, West Derby, Walton, Crosby, Litherland, Waterloo, and Bootle, have been entirely occupied by the mansions and villas of the opulent people of Liverpool.

Public buildings.

Although the old corporation admitted of no popular element, they did much in promoting the comfort and prosperity of the town. They gave 40 acres of land for the construction of docks; demolished the old castle, and placed a handsome church on its site; opened new markets; widened narrow and all but impassable streets; contributed to the building of the custom-house; erected several very handsome churches; and lent their aid individually to the establishment of many charitable institutions. Formerly the markets were held in the open streets, which were exceedingly narrow and inconvenient. Originally the conceptions of the council were not very large; and, naturally enough, when they provided markets they were very small ones, in the vicinity of the streets where the articles were formerly exposed for sale. The fish-market and the shambles were, therefore, placed in the neighbourhood of Castle Street; but these proving inadequate to the wants of the population, St John's Market, one of the largest in the world, was opened in 1822. It is 123 yards long, 45 wide, and embraces an area of 8235 square yards. The architecture is substantial though not ornamental. The roof is supported by 116 cast-iron pillars, and the market is lighted by 248 windows. Subsequently St James's Market at the S. end, and St Martin's Market at the N. end of the town were opened; and the corporation have added one market in Gill Street. But all these markets, with the exception of St John's, are indifferently attended; for the number of greengrocers has amazingly increased, and, as in London, bring the marketable necessities of life to the door of almost every inhabitant. The wholesale butchers and cattle-dealers always held their market outside the town; and some years ago they constructed a very large and efficient market at the Old Swan, 3 miles from the borough.

One of the waterworks—the Bootle—was commenced in 1797; the Harrington Company's works, on a larger scale, followed soon after; but as the supply from these works was scanty, and utterly insufficient in cases of fire, an additional supply of water was obtained by sinking a well in Green Lane, in the township of West Derby. Complaints however continuing; in 1847 the corporation purchased the whole of these works for about L.800,000, and soon afterwards obtained an act of parliament for constructing high-service waterworks at Rivington Pike, a few miles beyond Bolton. The distance from Liverpool is 26 miles; and the water was brought thence into Liverpool for the first time in January 1857.

Liverpool.
Town-hall.

The present town-hall, a noble structure, stands nearly on the site of the original Market Cross. The primitive structure was a thatched edifice, erected on arches, somewhat after the fashion of the present town-hall of Chester. Above were the council-room and assembly-room, and the space underneath was intended to be used as an exchange. In 1754 it was opened with great *éclat*; but the arcades beneath being dark, the merchants declined to use it, and still continued to assemble on an open place in the street. In 1795 the building was consumed by fire, but was restored two years afterwards; the interior being pretty much what it is now. The present dome and cupola were completed in 1802, and the projecting portico and its rustic arcaded basement were added in 1811. The interior of the building is very fine. There are a spacious hall, a council-room, treasurer's office, and town-clerk's offices, on the basement story. A very splendid staircase leads to a suite of drawing-rooms, a very fine dining-room, an immense ball-room, with a smaller one attached. On the first landing of the staircase stands Chantrey's statue of Canning, considered one of that great artist's masterpieces; in the reception-rooms is a portrait of Canning by Lawrence, and one of George III. by Shee; and also portraits of the Duke of Kent, George IV., and William IV. In the council-chamber are portraits of various gentlemen who have passed the mayorial chair; the last taken being that of Mr William Wallace Currie, the first mayor of the borough under the Municipal Reform Act. The town-hall is made, with great propriety, to form one square of the exchange. This noble pile of building was commenced in 1803. The cost was estimated at L.80,000; and although no one was allowed to take up more than ten shares, the whole sum was subscribed in less than two hours. The building was completed in 1809, at the cost of L.110,840. It forms three sides of a square, the fourth being formed by the town-hall. The inclosed area is 197 feet by 178, and has in the centre a bronze monument in honour of Nelson, erected in 1813, at a cost of L.9000. It was designed by M. C. Wyatt, and executed in bronze by Westmacott.

The mercantile offices which have sprung up around the Exchange are remarkable for their architectural beauty, as well as for their convenience. Water Street, from the town-hall to George's Dock, presents a succession of such buildings. On the site of the old tower, the last remnant of the Castle, have been erected the Tower Buildings,—a mass of counting-houses, ornamented towards the river by an Italian tower, now used as a semaphore telegraph station. Fenwick Street, at right angles with Water Street, presents a succession of buildings equally beautiful. The Corn Exchange is in Brunswick Street; and in the same street is the Union Bank, a perfect architectural *bijou*; and a little further on, in James Street, at the top of Fenwick Street, is the North and South Wales Bank, equally entitled to notice. In Castle Street stands the Branch Bank of England, constructed by Mr Cockerell; and in the same street the Commercial Bank Buildings, erected after Mr Cunningham's design. North John Street, which runs parallel with Castle Street, is entirely devoted to offices; and in Dale Street are situated the Royal Bank Buildings, remarkable for boldness of design. The custom-house, which stands at the foot of South Street, was built after a design of John Foster, at the cost of L.283,804. The estimate was L.175,000; and although the building is an imposing one in appearance, it is regarded as not fully answering its purposes. In front of it is a bronze statue of Huskisson, by Gibson. Part of the custom-house is used as a dock-office, and another part of it as the post-office; for neither of which is the building particularly suitable. To the E. of the custom-house is the Sailors' Home, which is admirably adapted to the intended object of the Marine Board, and for a sailors' dépôt.

Liverpool. Lord Street, Church Street, and Bold Street boast very splendid shops. These streets are the most fashionable resort. The shops compete in extent and grandeur with those of Regent and Bond Streets, London, and in one or two instances are pronounced superior. At the extremity of Bold Street is one of the finest churches in Liverpool,—St Luke's, from a design of Foster, one of the discoverers of the famous marbles; and higher up, in Hardman Street, is the Blind Asylum and the Philharmonic Hall. The portico of the Blind Asylum chapel is a fac-simile of that of Jupiter Panhellinus of Ægina, after the design of Foster. This hall cost £37,000, was built after the design of Mr Cunningham, and is unquestionably one of the most admirable music halls in the world. It is lighted by an ingenious plan of concealed gases under the ceiling; it will accommodate 3000 people; and is admirably ventilated. The Philharmonic Society embraces the wealth and fashion of Liverpool. It gives from a dozen to twenty concerts in the year, and at these concerts, from time to time, appear all the great *artistes* who visit England. Subscribers only are admitted to the boxes and stalls; but spacious galleries, capable of containing 1000 persons, are open to the public at prices varying from one to five shillings each. A very beautiful little chapel, belonging to the Unitarians, stands contiguous to the last-mentioned building; and in the vicinity there are several other chapels, including that of the Blind Asylum.

When Liverpool had completely emerged from its obscurity, laudable efforts were made to provide for the amusement and intellectual improvement of the people. The Athenæum Library and News-room owes its origin, in 1799, to the celebrated Roscoe, who was a native of Liverpool; and the Lycæum was built in 1804, when the old Liverpool Library was removed to it. The Royal Institution, founded in 1814, was intended for the instruction of the public, by the delivery of scientific and literary lectures, the establishment of public schools, and the formation of a museum of natural history and works of art. A news-room was also established in the Union Buildings, Duke Street; but the great news-room of the town is that in the E. side of the Exchange Buildings, to which subscribers are admitted by the annual payment of three guineas each. The room above it is also a Lloyd's room, devoted exclusively to the underwriters. The subscribers to the general news-room number more than 3000. The Athenæum Library, containing many valuable works, was, until recently, not a lending library; but in 1856 it was resolved that subscribers should be permitted to take out works for reading at home. The Lycæum Library has always been a lending library, and is unquestionably one of the largest and best conducted in England. There are also several private libraries of considerable extent in the town. The Royal Institution has a theatre for lectures, a gallery of ancient art, a museum of considerable value, to which the public are admitted every Monday, and a school of high repute, but which is no longer under the control of the members of the Institution. A free library was established here in 1852. (See article LIBRARIES.)

In Lime Street is the London and North-Western Railway Station, which owes much of its architectural attraction to the liberality of the town-council, who contributed largely to the cost. Opposite to it St George's Hall stands out boldly in a large open space on the brow of a descent; and when the Free Library is built on the north side, a magnificent place will present itself for ornament and recreation. St George's Hall is a massive pile of building in the classical style of architecture, designed by the late Harvey Lonsdale Elmes, and after his decease, carried out by Charles Robert Cockerell, R.A., of London, the professor of architecture to the Royal Academy. The ground on which this ornament to Liverpool has been erected slopes down considerably to the W.; and a plat-

form has been built containing a number of apartments, and an extensive apparatus for warming and ventilating the building above. On this basement, at the south end, a magnificent portico, with a double row of Corinthian columns, eight in front and four behind, and a pediment filled with sculpture, rises from an extensive flight of steps, forming the principal feature of the building. At the N. end a semicircular arrangement of eight attached columns incloses a hall, which appears to be the natural entrance to the edifice, and is so used when concerts are given. But there are three other entrances more generally available at the E. side, under a colonnade of sixteen pillars, forming what is called the east portico, also approached by a handsome flight of steps. Considering this to be the main building, the wings N. and S. are carried out with square pillars; the intercolumniations being built up so as to form the outer walls of the apartments within. On these screens it is proposed, at some time, to place statues and bas-reliefs on the panels between the pillars. There is no pediment on this side; but above the main façade there is an attic which extends over the whole building; and a second attic of considerably greater height, to cover the roof of the principal room which has given the name of St George's Hall to the whole structure. This fine hall, intended for public meetings and concerts, is 169 feet long, 74 feet wide on the floor, with galleries on each side 13 feet in depth, and is 84 feet high. The ceiling is semicylindrical, divided by arching and longitudinal bands into panels of various shapes and sizes, which are profusely decorated with plaster ornaments in relief, upon faintly coloured grounds, in the style of the modern continental *Renaissance*. Tritons and mermaids, tridents, masks, caducei, fasces, various coats of arms, St George and the Dragon, are scattered in profusion over the vault, which is supported on each side by five lateral arches springing from six columns of polished red Aberdeen granite, and massive piers which divide the galleries into deep recesses. On the western side these recesses are occupied by five lofty windows, 18 feet 6 inches high, and 8 feet 7 inches wide. The capitals of the columns are plaster, painted to imitate the granite shafts, it having been contemplated at one time to make them of bronze. The frieze of the entablature above them is curvilinear, and also painted to imitate red granite. The spandrels of these lateral arches are decorated with colossal figures, in alto-relievo, of Prudence, Fortitude, Science, Art, Justice, and Temperance, in duplicate, and principally copied from Raffaele's designs of these subjects in the *Stanze* of the Vatican at Rome. Prudence resembles a figure by Michael Angelo. On the floor, which is a beautiful specimen of Minton's encaustic tiles, inscriptions in Latin and English, referring to the figures above, are worked in so as to furnish both ornament and instruction. A portion of this floor, all round the room, is raised about two feet, to receive the warming and ventilating apparatus. Flights of steps at each end of the hall lead to the Crown Court at the S. end, and the Civil Court at the N. These entrances are between pillars of grey granite supporting an architrave, over which there is a semicircular opening, through which the architect, Mr Elmes, contemplated a vista of the whole length of the three compartments from the back of each court—a length of about 300 feet. His object has been defeated by his neglect to provide a situation for the organ, which is one of the finest in the world, built by Willis, under the superintendence of Dr S. S. Wesley, and is now placed on a circular platform occupying the N. end of the hall, and obstructing the view of the entrance into the Civil Court. Semicircular windows, 33 feet in diameter, concentric with the ceiling, are introduced at each end. There are three entrances on each side, closed by folding gates of bronze, from the corridors, corresponding with the three outer doors

Liverpool. under the eastern portico or colonnade. Ten bronze pendants, of elaborate workmanship, containing double circles of gas jets in the form of stars, light this splendid hall. The recesses on each side of the hall are converted into galleries over the corridors, in front of which balustrades of coloured marbles and Derbyshire spar have been introduced. Coloured marbles are also introduced as panels and other decorations of the walls below the galleries. Here also are niches for statues of distinguished persons;—George Stephenson the engineer and Sir Robert Peel are already placed. The courts are quadrangular apartments, divided as usual for judges and counsel, witnesses and jury, with a dock for the prisoners entered from below, in connection with the cells in the basement of the building. At the back of the judges' seats are retiring-rooms, and along the eastern side, in two stories, a grand jury-room, a library, refreshment and robing rooms, and all the usual accommodation for the persons attendant upon the civil and criminal proceedings of the county. This portion of the building forms the base of a fine screen of square pillars similar in size and character to the colonnade on the eastern side, and, from the slope of the ground, gives by far the most imposing view of this great structure. Over the north hall there is a small circular concert-room, on which great expense has been lavished in a profusion of elaborate ornament.

This magnificent pile of buildings is pronounced by general consent to be the finest in Great Britain. The circumstances out of which the building of St George's Hall arose were as follows:—It had been resolved to build a music hall by subscription, and the corporation gave the land in Lime Street for that purpose, but a sufficient number of subscribers did not come forward. In the meantime, the assizes in 1835 were transferred from Lancaster to Liverpool, and the Sessions House being unsuitable, the corporation resolved to build new courts. Enlarging their view, the council at once superseded the music committee, took the charge of the building on themselves, and after examination of various places, resolved to have two assize courts, a council-room and a common hall under one roof; and this has been accomplished so well, that the common hall has become the most elegant council-room in the world. The first estimate of the architect was L.85,000; but it is believed that the work when finished will cost L.200,000. Mr Elmes died while the building was yet a skeleton, and as he left his friend Mr Robert Rawlinson, C.E., in charge, that gentleman accomplished what was considered impracticable, by turning the arch of the roof with hollow bricks. The assizes are now held here, and concerts are being given three or four times a-week. The council has appointed organists of the highest reputation

at L.350 a-year, to preside at the organ; and organ performances at small charges are given twice, sometimes three times a-week, to crowded audiences. **Liverpool, Charles Jenkinson.**

In addition to the St George's and the Philharmonic Halls, there are three other large concert-rooms in the town; there are four theatres, all well attended; and among the educational institutions, in addition to those already mentioned, are the Mechanics' and the Collegiate Institutions, both elegant and convenient buildings.

The population of the old borough in 1801 was 77,653; in 1811, 94,376; in 1821, 118,972; in 1831, 203,572; in 1841, in the new borough, 286,487; and in 1851, 376,065.

The usual rate of increase from 1851 to 1857 will have augmented the population to more than 400,000, and latterly it has gone on in an accelerated ratio. Proof of this is derived from the fact, that the number of new houses erected in 1855 was 1355, while in 1856 it was 1703; and the total number from 1838 to 1856 was 27,967. The annual value of the property assessed was L.1,461,577, and the local taxes assess at from 6s. to 7s. in the pound.

The paving, cleansing, sewerage, and lighting, are under the direction of the Health Committee of the council, assisted by a borough engineer, a surveyor of buildings, an inspector of nuisances, and a medical officer. In 1830 Liverpool was one of the most unhealthy towns in England; now it is one of the healthiest. The supply of water is under the care of the Water Committee, and in 1856 the water rate produced L.76,000, being L.15,000 above the expenditure.

Before 1836 Liverpool was protected only by a few de- **Police.** tective officers and a nightly watch, but under the Municipal Reform Bill an efficient constabulary force was established. It now consists of about 900 men for docks and town, both under one head constable. The borough gaol formerly stood in Great Howard Street, but in 1854 a new and spacious gaol was opened at Walton, 3 miles from the town.

The charitable institutions in Liverpool are numerous and well supported. There is a large workhouse generally containing 1700 paupers; an industrial school with about 900 children; three large hospitals; three dispensaries; and one eye-and-ear infirmary.

According to Mr Horace Mann's summary of the census, **Religion and education.** there were in Liverpool in 1851, 121 schools, in which 35,171 children were being educated, of which 82 schools, containing 25,963 children, were supported by religious bodies. There are in the town two parochial charges,—St Peter's and St Nicholas,—and 46 other churches belonging to the Established Church, 53 Dissenting chapels, 2 synagogues, and 12 Roman Catholic chapels. (W. J. W.)

LIVERPOOL, a seaport town of Nova Scotia, capital of Queen's County, on the right bank of a cognominal stream, near its mouth, 75 miles S.S.W. of Halifax; N. Lat. 44. 3., W. Long. 64. 42. It is regularly laid out, and contains several good public buildings. The harbour is commodious, but the bar admits only vessels of light draught. Timber and dried fish are exported in large quantities to the West Indies and the United States. In 1851, 84 vessels, of the aggregate burden of 9808 tons, and 104 of 12,640 tons, cleared at the port. The exports in that year amounted in value to L.30,392, of which to the value of L.23,049 were sent to the West Indian Islands. Pop. of county (1851) 7256.

LIVERPOOL, a seaport-town of New Brunswick, capital of Kent county, on the N. side of Richibucto Harbour, 45 miles S.E. of Miramichi; N. Lat. 46. 43., W. Long. 64. 54. It has a safe and commodious harbour, and an increasing trade in timber and deals. Pop. of county (1851) 11,410.

LIVERPOOL, CHARLES JENKINSON, first Earl of, was the eldest son of Col. Jenkinson, the representative of a family which had been settled at Walcot, near Charlbury, Oxfordshire, for above a century. Mr Jenkinson received his education at the Charter-House School and at the University of Oxford. In early life he published *Verses on the Death of Frederick Prince of Wales*; a *Dissertation on the Establishment of a National and Constitutional Force in England, independently of a Standing Army*; and a *Discourse on the Conduct of Government respecting Neutral Nations*. In 1761, having obtained an introduction to the Earl of Bute, he became one of the under-secretaries of state, and in the same year was returned to parliament for Cockermouth. In 1763 he was appointed joint-secretary to the Treasury; and having shared the marked favour of his majesty George III. with Lord Bute, he, on that nobleman's sudden retirement from office, became a conspicuous member of the party then commonly called the King's Friends. On the accession to power, of the Rockingham administration, in

Liverpool. 1765, he resigned his public appointments; but about the same period he was nominated auditor of accounts to the Princess-Dowager of Wales. In 1766 he was appointed a lord of the Admiralty by the Grafton administration; and the following year he became a lord of the Treasury. Under Lord North's government new honours awaited this steady aspirant for promotion. In 1772 he was appointed one of the vice-treasurers of Ireland; and in 1775 he was allowed to purchase the patent office of clerkship of the pells in that country. He afterwards succeeded Lord Cadogan as master of the mint; and in 1778 he became secretary-at-war. In 1783 he became a member of the Board of Trade; and in 1785 he published his *Collection of all the Treaties of Peace, Alliance, and Commerce, between Great Britain and other Powers, from the Treaty of Munster in 1648 to the Treaties signed at Paris in 1783*. In 1786 he was made chancellor of the duchy of Lancaster; called up to the House of Lords by the style and title of Baron Hawkesbury of Hawkesbury, in the county of Gloucester; and appointed president of the Board of Trade. In 1796 he was advanced to the dignity of Earl of Liverpool. His lordship was twice married, and had two sons and a daughter. After obtaining his earldom, he rarely quitted his retirement; but whenever he spoke in the House of Peers, the extent and accuracy of his information, particularly on commercial subjects, procured him marked attention. In 1805 he addressed a letter to the king on the coins of the realm, containing a concise and distinct statement of most of the facts deserving of notice in the history of British coinage. He died 17th December 1808.

LIVERPOOL, Robert Banks Jenkinson, second Earl of, son of the preceding, was born 7th June 1770. At an early age he was placed at an academy at Parson's Green, near Fulham, where he remained until his thirteenth year; he was then removed to the Charter-House School, where he continued between two and three years; and soon after leaving the Charter-House, he was entered as a student at Christ Church College, Oxford, where he became acquainted with Mr Canning. About the period of the breaking out of the French Revolution, Mr Jenkinson paid a visit to Paris, and was in that capital when the Bastille was demolished. Soon after his return to England he was introduced to parliament as one of the representatives of Rye, and took his seat under the avowed patronage of the minister, Mr Pitt. His first speech was delivered on the 27th February 1792, and manifested considerable ability. His next public appearance was as an opponent of the abolition of the slave trade. On the 2d of April 1792, Mr Wilberforce moved, in a committee of the whole house, "that the trade carried on by British subjects for the purpose of obtaining slaves on the coast of Africa, ought to be abolished." Mr Dundas proposed to insert the word "gradually," before the word "abolished;" but Mr Jenkinson moved "that the chairman should leave the chair." The amendment was, however, rejected by a large majority, and Mr Dundas's more adroit proposition agreed to.

Mr Jenkinson's next appearance was in a more prominent and less questionable position. The King of France had been deposed, and the British ambassador, Lord Gower, recalled. On the 15th of December 1792, Mr Fox moved an address to the king, praying that a minister might be sent to Paris to treat with the provisional government of France, touching such points as might be in discussion between his majesty and his allies, and the French nation. In the temporary absence of Mr Pitt, who had vacated his seat by accepting the wardenship of the Cinque Ports, Mr Jenkinson replied to Mr Fox, in a speech which was warmly complimented by Burke. The motion was negatived without a division. In April 1793, Mr Jenkinson was appointed one of the commissioners of the India Board; and on the 6th of May he stood forward in opposition to Mr

Grey's memorable motion on the subject of parliamentary reform. On the 6th March 1794, he opposed Mr Grey's motion for an address to the king, expressive of the concern of the House that his majesty should have formed an alliance with powers whose apparent aim was to regulate the affairs of a country with which they had no right to interfere. On the 10th of April, he undertook a more difficult task, namely, to justify the measures of the ministry, and to palliate the failure of the army commanded by the Duke of York at Dunkirk. On the 30th May 1794, he made one of his best efforts, in opposition to Mr Fox's motion, for putting an end to the war with France. This was perhaps the most active period of his life.

On the 25th March 1795, he married the third daughter of the Earl of Bristol and Bishop of Derry. At the opening of the session of 1796, the address was seconded by Mr Stewart, afterwards Lord Castlereagh, in the first speech delivered by him in the House of Commons. He was answered by Mr Sheridan, who strongly censured ministers, at the same time advising them to declare themselves willing to treat with the French Republic. Mr Jenkinson replied to Mr Sheridan, repeating his former arguments in justification of the government measures. On Mr Grey's motion in the House of Commons (10th March 1796) for an inquiry into the state of the nation, Mr Jenkinson descanted on the effect of the war upon our commerce, contending that, notwithstanding its pressure, the situation of Great Britain, in a commercial point of view, was more prosperous than at any preceding period. On the 28th of May 1796, he participated in the honours of his family, exchanging its surname for his father's second title of Lord Hawkesbury. On the temporary retirement of Mr Pitt from power early in 1801, a new ministry was formed, with Mr Addington at its head; and Lord Hawkesbury, who was appointed to the office of secretary of state for the foreign department, took a prominent part in the debates which ensued. The great business of the succeeding summer and autumn consisted in the adjustment of preliminaries of peace with France. In October Lord Hawkesbury remonstrated against the occupation of Switzerland by the French under Ney, in order to enforce the reception of a new constitution for that country, prepared by the First Consul in his own cabinet.

At this period, the management of the House of Commons had, in a great measure, devolved on Lord Hawkesbury, who, of course, spoke on every topic involving the character of the administration, as well as on the political questions which were brought under the consideration of the House of Commons. At the opening of the next session of parliament he was called to the House of Lords; but the only measure of importance which in that session he brought forward in the new situation in the legislature where he had been placed to defend the measures of ministers, was the Volunteer Consolidation Bill. About the same time he addressed a circular to the ministers of foreign courts resident in London, disclaiming indignantly the charge that his majesty's government had been a party to plans of assassination, and describing the recent seizure and execution of the Duke d'Enghien as "a sanguinary deed, perpetrated by the direct order of the First Consul, in violation of the rights of nations, and in contempt of the most simple laws of humanity and honour."

On the 12th of May, the administration was dissolved by the resignation of Mr Addington; Mr Pitt returned to the head of the ministry, and Lord Hawkesbury received the seals of the home department. The renewal of the war being now inevitable, the first effort of the new government was to place the military establishments of the country on a more enlarged and efficient footing; and, with this view, Lord Hawkesbury exerted himself in the House of Lords in support of the Additional Force Bill. At a later

Livery. period of the session, Mr Wilberforce renewed his attempts to put an end to the slave trade, and a bill for that purpose passed the House of Commons; but on its transmission to the House of Peers, it was postponed, on the motion of Lord Hawkesbury, for more mature investigation in the ensuing session. On the 10th of May 1805, Lord Grenville moved the order of the day for taking into consideration the petitions of the Roman Catholics of Ireland. This motion Lord Hawkesbury also opposed. The death of Mr Pitt afforded Lord Hawkesbury an opportunity of placing himself at the head of the cabinet; but being well acquainted with the relative position and strength of parties, his ambition yielded to his good sense, and he declined the flattering offer. He was, however, the political heir of Mr Pitt in all except his talents. Towards the close of 1808, Lord Hawkesbury was, by the death of his father, placed at the head of his family, as second Earl of Liverpool.

Under the administration of Percival, Lord Liverpool became secretary of state for the war department, and after the assassination of the premier, he was placed at the head of the government. (See BRITAIN.) Lord Liverpool died 4th of December 1828.

LIVERY. When the Greeks used the proverbial saying—*μάστιγον ἀνὴρ*, "the dress shows the man"—they applied the pithy "saw" as much to the social condition as to the moral character of the individual. The "livery" has, accordingly, ever been taken to mark rather than distinguish the menial or the mercenary. The latter, however, resists the term, and claims for his dress the name of "uniform." When Cœnomaus clothed his circus troops in green or blue costumes, he did not, as many have asserted, introduce the fashion of liveries; he simply decked his mimic warriors in fancy dresses. The custom of livery is really derived from the term *liberata* or *liberatio*, a term applied to the delivery or distribution (made by the kings of the Merovingian and Carolingian races) of particular sets of clothes to the servants throughout the palace, and at the sovereign's expense. In common phrase, this was called a *livrée*, and it was ordinarily performed in the plenary courts of France.

A term of similar signification was given to the distribution made by the early German emperors, and which consisted of uniform dresses and wages delivered into the hands of the servants of the imperial household.

In the days of chivalry, livery, in the proper sense of the word, often covered noble backs, without bringing disgrace thereon. The duke's son, as page to a prince, wore the prince's livery. The earl's second son, serving a duke, donned his master's coat and colours. The knight's second son was in a similar condition as an earl's servant. The esquire's son joyfully wore the livery of the knight whom he served; and the gentleman's son performed, in a similar dress, the duty of servant to the esquire. More than this, the younger brother of a nobleman has been known to serve his elder brother, and to wear, with all humility, the older kinsman's coat and badge.

This badge was formerly the indispensable accompaniment to the coat. "Livery and badge" are as old as the time of Edward IV. The badge was a cloth or silver circle, borne on the left arm, and carrying the crest of the wearer's master. It is still retained by a few noble families; and, as a fashion, it yet lingers on the coat sleeves of corporation watermen and the fraternity of firemen. At first, however, the mode was so general—the habit itself being blue, and the badge affixed to it—that the proverb arose, applicable to things or persons lacking ordinary appendages—"Like a blue coat without a badge."

The silver badge was probably peculiar to England, as it appears, in the time of Elizabeth at least, to have excited the astonishment of most foreign travellers. Laced cloaks

were delivered to servants, in the reign of James I., according to the assertion of the gossiping Fynes Moryson, who further informs us that, sixty or seventy years before he was writing, A.D. 1617, coaches were very rare; but that at the date just mentioned, there was scarcely an elder brother who was without one; and that these cumbersome vehicles, with their liveried coachmen, continually "stopped the way." We get at an additional social trait connected with the wearers of livery, in the remark, that "Londoners say woe to him that taketh a servant from St Paul's church"—in one of the aisles of which they walked about, waiting to be hired.

During a very considerable period, livery was worn by other common men besides salaried menials. The men alluded to were the "retainers" of noblemen. These retainers served for a year, and wore their hirer's livery. Their service was that of the strong hand, which was ever ready to be raised, and prompt to descend, in their masters' quarrels. They wore a full suit, and were a formidable body; so formidable that, without license, no noble could at last retain such followers. The law ordained, with some singularity, that a master was permitted to give livery only to his own household servants, officers, and counsel learned in the law! The act was evaded, and then the penalty of imprisonment which it awarded was increased by a fine of L.5 per month for every retainer kept without license.

Henry VII. was, of all English sovereigns, the one who looked most sharply after the means of increasing his revenues; and, on one occasion, he applied this matter of unlicensed liveried retainers to that particular object. The king had been the guest of his old and faithful servant, the Earl of Oxford, at Henningham. Hospitality to a monarch was a heavy charge to the moderately wealthy earl, who, however, displayed a princely liberality. The king, at parting, told him that, much as his hospitality had been spoken of, his munificence exceeded report; and, as he spoke, Henry pointed to the long double row of liveried servants who lined each side of the way by which he passed. A man who could keep so many menial servants must be of princely means indeed. The earl, however, hastened to reply, that, in that sense, he was not their master. They were, he said, simply retainers of his who attended there to do him service, and partly out of curiosity "to see his grace." "Now, by my faith!" exclaimed Henry, "I may thank you, my lord, for your good cheer; but I may not endure to have my laws broken in my sight. My attorney must speak with you." The threatened colloquy was a costly one, for the poor earl was mulcted in the enormous sum, for the period, of L.10,000, only for putting his livery on a few scores of backs, contrary to the statute of Henry's first parliament.

It has been observed of Queen Mary, that she granted more licenses by half, for permission to maintain liveried retainers, in five years, than her sister Elizabeth did in thirteen. In the briefer time, Mary granted thirty-nine licenses, while in the more extended period, Elizabeth signed only fifteen. Mary, too, sometimes gave permission to one man to maintain two hundred retainers; but Elizabeth never consented to allow more than one hundred to the same individual. Mary's bishop, Gardiner, had not less than two hundred of these liveried soldiers, rather than servants, while Elizabeth's archbishop, Parker, was permitted to raise only forty. The license to the latter, which is printed in the volume of the correspondence of the prelate, edited for the Parker Society by Mr Bruce and the Rev. T. T. Brown, is addressed by Elizabeth "To all men," to whom it says, "Know ye this, of our special grace, certain knowledge, and mere motion, and by the advice of our council, we have given and granted full authority, power, and license, unto the most reverend Father in God, Matthew, Archbishop of Canterbury, full authority

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Livery. that he during his life; may lawfully, and without question, loss, damage, forfeiture, or other penalty, retain and keep in his service, from time to time, by way of retainers, over and besides all such persons as daily attend upon him in his household, and to whom he giveth meat, drink, livery, fee, or wages, and also over and besides all such persons as shall be under him in any office, of any stewardship, under-stewardship, bailiffick, keeper of park-houses, warrens, or other games of venerie, pheasants, partridges, and other fowls of what kind soever, &c., the number of forty persons, gentlemen, or yeomen, though they be tenants to us, or resident within our honours, &c.; to give, at his pleasure, his livery, badge, or cognisance, &c., to do unto him their service, &c.; the said persons to be reputed, taken, and accepted, by virtue of this our grant and license, to all instructions, constructions, and intents, as of the daily attendants of the said archbishop in his household. Provided that this our grant shall not extend unto him to take or retain into his service any of our servants being named in our cheque roll, nor any other being sworn or retained to serve us as our said servant. And furthermore, we have pardoned and released to the archbishop all and every trespass, or acts of retainer heretofore had, or any contempt, violation, or forfeiture, &c., perpetrated or done since the first of January last past, contrary to any act of retainers, &c. In witness, &c., the 16th day of May, in the 5th year of our reign."

Licenses and retainers were alike abolished in the reign of Charles II. Since that period, livery has only been worn by the lower class of male household servants. While a servant wears livery, he is addressed by his Christian name, but when he is promoted from the servants' hall to the steward's room company, he drops his baptismal, and is thenceforward distinguished by his surname. The coachman is the recognised chief of the liveried corps; and at meals he presides at the head of the table, by right of his office, in establishments where the unliveried gentlemen take their repasts at a separate table. Many of the appendages of livery may be traced to fashions in dress once patronized by nobles. The long waistcoat of the groom is the old undercoat of the esquire, and the three-cornered hat of the coachman once figured at sovereign courts on aristocratic brows. It was driven out of fashion by being stigmatized as "an Egham, Staines, and Windsor," from the triangular direction-post to these places which it was said to resemble. There is one instance of waiters at a tavern wearing livery. It is noticed by Walpole, who describes the "drawers" at the King's Arms as being dressed in brown frocks with blue aprons. This seemed too poor for Sir Ralph Gore, who gave them laced clothes. In France, where the fashion of liveries was occasionally of extravagant splendour, and wealthy men delighted in feeling helpless, and maintaining a crowd of Frontins and Germains to minister to them, the fashion and the word so betokened a menial, that liveries were abolished by the Constituent National Assembly, as incompatible with a republican system founded on the imaginary tripod of liberty, equality, and fraternity.

In France, however, the laced brotherhood may boast of having had Rousseau for a member. It will be remembered that, when waiting at table, he corrected his master's faults in grammar. In England, Dodsley, the once well-known author and publisher in Pall Mall, commenced life in the same menial condition. He was footman in the service of the honourable Mrs Lowther when he published his first poetical work, "The Muse in Livery," with a long list of subscribers. The modest volume bore this epigraph:—

"You laugh, and think 'twould be a jest
To see a Muse in liv'ry drest;
But when I mount behind the coach,

And bear aloft a flaming torch,
Methinks on Pegasus I fly,
With fire poetic blazing through the sky."

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"What can be expected," he asks, "from the pen of a poor footman,—a character that expresseth want both of friends, fortune, and all the advantages of a liberal education, or a polite converse." The liveried poet speaks of his natural genius as "depressed by the sense of his low condition; a condition," he adds, "from which he never hopes to rise, but by the goodness of Providence influencing some generous mind to support an honest and a grateful heart." His description of a liveried servant's daily life is portrayed with some spirit; and the following lines will serve to show how he made of the dinner hour a time for improving himself:—

"This is the only pleasant hour
Which I have in the twenty-four;
For whilst I unregarded stand,
With ready salver in my hand,
And seem to understand no more
Than just what's call'd for out to pour;
I hear, and mark the courtly phrases,
And all the elegance that praises;
Disputes maintained without digression,
With ready wit and fine expression;
The laws of true politeness stated,
And what good breeding is, debated;
Where all unanimously exclude
The vain coquet, the formal prude,
The ceremonious and the rude;
The flattering, fawning, praising train;
The fluttering, empty, noisy, vain;
Detraction, mut, and what's profane."

Such was the footman who shared with Stephen Duck the patronage of the great; who wrote the *Cleone*, which gave immortality to the glittering beauty, Bellamy; who was the author of the once famous *Economy of Human Life*, which had the honour of being attributed to the pen of Chesterfield; and whose book-shop in Pall Mall was the resort of wits, statesmen, poets, philosophers, and fine gentlemen.

Dodsley lived and died in a century when footmen especially claimed and enjoyed a certain distinction. It was a century in which Lady Harriet Wentworth married Sturgeon, the favourite footman of her father, the Marquis of Rockingham. It was these favourite footmen who at the theatre occupied the seats retained in the boxes till the arrival of their mistresses. Their very crimes but took the guise of foibles; and Lady Mary Wortley Montague made a hero of a liveried Tarquin, named Arthur Gray. If they were esteemed living, they were sometimes honoured after death; and Walpole informs us how the old Duchess of Douglas, having lost her favourite footman in Paris, had his body embalmed, packed up in the front part of her own travelling carriage, and brought to England, under her personal escort, for interment! The dignity of the office was signified on one occasion by the state coachman of George II., who left a fortune to a son in plush,—a portion of which he was to forfeit, in the event of his condescending to marry a maid of honour. So puffed up, indeed, was this class of retainers by their fancied importance, that when the Rev. Mr Townley's farce of *High Life Below Stairs* was first represented, the exposure of these mock pretensions of the brotherhood was met, in the London and Edinburgh theatres, by such serious riots on the part of the "gentlemen's gentlemen," as to cause the abolition of their free admission to the gallery, and to bring upon them a hurricane of ridicule, beneath which their dignity and pretensions were wrecked for ever. The latter did not even revive when the late eccentric Lord Harrington "cut out" those shapeless livery coats for his own men, which, for a time, elicited more surprise than admiration on the part of

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all beholders. Many instances might be cited from the histories of the South Sea and Mississippi schemes, of footmen speculating into large fortunes, and occasionally, through forgetfulness, getting up behind, instead of into, the carriages which fortune had enabled them to set up. But the most striking example of the two extremes is in the case of "Baron Ward," who commenced life as a livery servant, and who ended his public career as prime minister of the late Duke of Parma.

The poets have made ample use of the menial word, and with poetic power have conferred on it a real dignity of application. One speaks of wearing the "virtuous livery" of his mistress; another puts "April's livery" on spring; Milton makes of twilight the "sober livery" of evening; and of a tropical complexion the "shadowed livery of the burnished sun." Hood has, with his usual happy facetiousness, described the livery of earth as "grass-green turned up with brown;" and a French moralist places two parties on the same level by stating that "les ambitieux et les laquais portent indifféremment toutes les livrées."

The word "livery" is further applied to the 91 companies of the city of London. The members of these companies originally wore habiliments in form and colour resembling those of the lord mayor and sheriffs. The wardens of companies were accustomed annually to deliver to the Lord Mayor certain sums, twenty shillings of which were given to individuals who petitioned for the money, to enable them to procure sufficient cloth for a suit. When the companies thus wore their liveries, the splendour of the civic train was the pride of all good citizens.

There remains only to notice the word "livery" as a legal term. In this sense it implies to give and take possession. It also signifies a release from wardship; and, before written deeds were common, it was applied to that form of conveyance of copyhold estates, when the seller delivered a rod or wand to the lord, which the latter placed in the hands of the purchaser, in the presence of tenants, who were called upon to witness this act of "livery."

Finally, and to return to the earlier division of our subject, the reader is referred to Fielding's *Joseph Andrews* for a brief sketch of what the liveried footman of the last century was. He aped all the fashionable vices of the day; wore his hair in papers in the morning, and curled in the afternoon; criticised new operas, was riotous at the play, rather rollicking at church, and gave accommodation money to the steward for paying his wages half a year before they were usually payable, which was "perhaps half a year after they were due." It was a period when society was generally corrupted, and when masters were as proud of their vices as their servants were of their liveries.

(J. D.—N.)

LIVIVS, TITUS, the most celebrated of the Roman historians, was descended from an illustrious family which had given several consuls to Rome. Only a few particulars of his life have been transmitted to us. He was born at Patavium, now *Padua*, in the N. of Italy, B.C. 59, the year before Cicero was driven into banishment; and died at the advanced age of seventy-six, A. D. 17, the same year as Ovid. He resided during the greater part of his life at Rome; and, if we may credit a statement of Suetonius (*in Claud.* 41), became the instructor of the Emperor Claudius. His history was written partly at Rome and partly at Naples, and it is said that his reputation was so widely diffused, that a native of Gades, now *Cadiz*, in Spain, actually visited Rome for no other purpose than to have the pleasure of forming an acquaintance with the historian. (*Plin. Ep.* ii. 3.) From some inscriptions found at Padua (*in* 1413), it has been asserted that Livy was twice married, and had two sons and four daughters; but this must rest merely on conjecture, as there were no doubt many of the same name in Padua. Seneca (*Proem. v. Controv.*), indeed,

states that one of his daughters was married to L. Magius, the rhetorician.

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Besides his history, we are acquainted with the titles of three other works of which he was the author; but not a fragment of them has been preserved. These were,—*Epistola ad Filium scripta*, mentioned by Quintilian (*i.* 10); *Dialogi*, which Seneca (*Epist. c.*) hesitates whether he ought to class amongst historical or philosophical works; and *Libri ex professo Philosophiam continentes*. The loss, however, of these works is less a subject of regret than that of the greater part of his *Roman History*, or, as he himself modestly entitles it, *Annals of the Roman People*. This work extends from the building of the city to the year 744 (B.C. 9), when Drusus was carrying on war in Germany, and in which he died. Livy undertook this work probably at the suggestion of Augustus, when he was already far advanced in years. It consisted of 142 books, of which only thirty-five remain; and some of these (*lib. xli. xliii. xlv. xlv.*) are in a very imperfect state. The first ten contain the history of Rome from its foundation to B.C. 294; the others (*xxi. xlv.*) from B.C. 219 to B.C. 167, or from the beginning of the second Punic war to the end of the wars with Perseus and Gentius. Of the remaining books we possess only considerable fragments, with short epitomes, which have been supposed, though without any sufficient reason, to have been composed by the writer Florus. The whole were not discovered at one time, but were supplied partly from MS. belonging to the cathedral church of St Martin at Mayence, partly from one found in the convent of Lorsch, near Worms, and partly from a palimpsest in the Vatican, of which Niebuhr published a full copy at Berlin in 1820. No MS. has yet been discovered containing all the books now extant. There is, indeed, no loss that has befallen us in Roman literature at all to be compared to that which has left this history imperfect.

Livy follows a chronological arrangement in his history, and, like Dionysius of Harlicarnassus, has adopted the Cætonian era for his basis. He therefore supposed the city of Rome to have been founded B.C. 751, whereas Varro placed it two years earlier, B.C. 753. The sources from which he derived his information, more particularly for the earlier parts of his history, seem less worthy of belief, though he probably had recourse to the best within his reach. All the more ancient historical records had no doubt disappeared, and he could therefore only be acquainted with their statements through the medium of later annalists. For this early period he had recourse to the works of no Greek historian, unless we include amongst them that of L. Cincius Alimentus, who, though a Roman, wrote in the Greek language. This author served in the second Punic war, and he is called by Livy (*vii.* 3) a most diligent investigator of ancient monuments. In the early part of the war he fell into the hands of Hannibal, and from him he received an account of his passage through Gaul and across the Alps, which he incorporated in his history. To the works of this writer Livy acknowledges himself much indebted. As to the sources from which he drew his materials for the second decade (*xi.–xx.*), which is lost, all that can be said is only matter of conjecture; but we know that Polybius was the principal writer whom he consulted, and that he followed that writer generally both in the arrangement of his materials and in the development of the story. It is not a sufficient answer to this that Livy seldom alludes to Polybius as his authority, since he does not think it necessary to cite the writer upon whom he depends for his information, unless on occasions where there is a difference of opinion. There is no doubt, that wherever he has adopted the statements of Polybius, we may place perfect confidence in the account; and yet, where they differ, we must not condemn Livy, who evidently consulted Roman authorities of undoubted credi-

Livius. lity, and who may, upon due examination, have come to the conclusion that Polybius was mistaken. The difference in the accounts given by the two historians of Hannibal's passage across the Alps is an example of this, though the balance of probability is greatly in favour of that of Polybius.

Livy has been accused of a wilful perversion of the truth, of an undue partiality for his own country, and a desire to recommend himself to the favour of the nobility, by flattering their pride by the manner in which he records the deeds of their ancestors. But if he represents the characters of his countrymen in a different light from other writers, might he not suppose himself better able to appreciate their conduct? and if his love of country led him to conceal whatever might be prejudicial to them in the eyes of posterity, it was a fault for which he may be forgiven, though it certainly must be allowed to detract considerably from the value of his work. He has been accused also of superstition, because he has reported faithfully all the prodigies and omens in which those early ages abounded, and which seemed to have formed the principal part of their religion; but he has several times observed, that he narrates those wonderful events because he found them in the ancient annalists whom he consulted, without meaning to vouch for their accuracy. Livy was evidently gifted by nature with a brilliant talent for narration, and for seizing the characteristic features of humanity. He was a poet, though without the power or perhaps the love of versifying. His rhetorical powers, too, were of the highest order; and, in the palmy state of the republic, he would have ranked among the first orators of his age. The periods of Livy are full and well rounded, in imitation of the style of Cicero; and indeed the age in which he lived would have tolerated no other mode of writing. It is strange that there should be any difficulty in discovering the political sentiments of the historian; but he felt that he was writing under the eye of a despot, however amiable, and he thought himself obliged to suppress many sentiments to which he would, in other circumstances, have given utterance. He was fully sensible of the degeneracy of his own days, and was glad to forget it by reviving the recollection of all that was glorious and noble in the past. He might also imagine that he could excite in the breasts of his countrymen a desire to emulate the heroic deeds of their ancestors, and might thus be the means of restoring the constitution of his country to its ancient form and strength. It is said that Augustus accused him of being too favourable to the party of Pompey (Tacit. *Ann.* iv. 34); and we may therefore conclude that he was in his heart a partisan of the republic. It has been much disputed what Asinius Pollio (*Quintil.* viii. 1) meant by the accusation he brought against Livy of Patavinity (*Patavinatas*); but it seems the most likely conjecture that it was some provincialism in the language and style, perceptible to the refined ear of a Roman critic, though we can no longer discern it.

Livy's history was first printed at Rome, about the year 1469, by Sweynheym and Pannartz, in folio. Of this rare edition Lord Spencer is in possession of a fine copy; but the most exquisite one is that printed on vellum, which formerly belonged to the Imperial Library at Vienna, but was afterwards acquired by a private collector in England. Among the subsequent editions of the history may be mentioned that of Gronovius, who first placed the text upon a satisfactory basis by a collation of many MSS., of which the best edition is printed by Elzevir, 3 vols. 8vo, 1679; that of Leclerc, 10 vols. 8vo, Amsterdam, 1710, containing the supplements of Freinsheimius entire; that of Crevier, 6 vols. 4to, Paris, 1735. The standard edition is considered to be by Drakenborch, published at Leyden, in 7 vols. 4to, 1738-46. Later editions, by Ruperti, Göttingen, 1807; and of Bekker and Raschig,

Leipsic, 1829, are of less value. There is a new edition by Alchefschi, Berlin, 8vo, 1841, brought down to the end of the first decade; but perhaps Drakenborch, with the *Commentaries* of Lachmann, supplies every assistance necessary for the scholar. (See Schweiger's *Handbuch der Classischen Bibliographie*, 8vo, Leipsic, 1839.) There are the following English translations:—Philon Holland, folio, London, 1600-1659; Baker's, in many editions; and one published by John Hayes (London, 1744-45, 6 vols. 8vo), said to be executed by several hands; also one in Bohn's Classical Library, 1850.

LIVIVS, Andronicus, a comic poet who flourished at Rome about 240 years before the Christian era. He was the first who turned the personal satires and Fescennine verses, so long the admiration of the Romans, into the form of a proper dialogue and regular play. Though the character of a player, so valued and applauded in Greece, was reckoned vile and despicable amongst the Romans, Andronicus acted a part in his dramatical compositions. Andronicus was the freedman of M. Livius Salinator, whose children he educated. His poetry had grown obsolete in the age of Cicero, whose nicety and judgment would not even recommend the reading of it. Horace mentions his dramas as popular in schools; but Suetonius says they were mere translations from the Greek. His *Hymns* are said to have been sung to propitiate the gods. A Latin *Odyssey* is attributed to him; but of this, as well as of his plays, tradition has only preserved the name.

LIVONIA, or **LIVLAND**, a maritime government of Russia, on the Baltic, bounded N. by Esthonia, W. by the Gulf of Riga (which contains the island of Oesel, belonging to this government), S. by Courland and Vitepsk, and E. by Pskov and the Peipus Lake, between N. Lat. 56. 30. and 59. 6, and E. Long. 23. 10. and 27. 35. It is 170 miles in length from N. to S., by 110 miles in breadth, and contains an area of 18,146 square miles, with a population, in 1851, of 821,457 persons. The general surface of the country is flat, and in some places marshy. Undulations, however, occur here and there; and near Venden an elevation called the Mesenberg rises to the height of 1200 feet. Lakes cover a large part of the surface, and are mostly extensive sheets of water. The largest is the Peipus See, which separates Livland from the government of St Petersburg, and is connected by a narrow channel with Lake Pskov to the S. It is 50 miles long from N. to S., by 27 broad, contains several islands, the largest of which is Porka, and is well stocked with fish. The shores of the lake are low and marshy; and its waters, though sufficiently deep for small craft, are subject to frequent squalls. Lake Vitzerve, occupying a central position in the government, is next in size to the Peipus, and communicates with it by means of the Embach. The chief river is the Dwina, which for some miles separates this government from Courland, and afterwards flows through Livland to its mouth near Riga. The other important streams are the Aa, Salis, and Pernau, all of which take their rise in the government, and fall into the Gulf of Riga. Livonia suffers from extreme and protracted cold in winter, and great heat in summer. The former, however, is advantageous for the conveyance of goods from the interior to the seaports by means of sledges, enabling vessels to start from Riga and elsewhere immediately on the return of spring. Agriculture and cattle-rearing form the great occupations of the Livonians. The soil is for the most part sandy, with here and there districts of clay and loam. Grain and potatoes form the principal agricultural products, while from the extensive forests the inhabitants are supplied with abundance of fuel and excellent timber. Among its other productions, the chief are flax, hemp, linseed, and hops. Live stock receives a considerable amount of attention, especially from the large proprietors, who vie with each other in improving their breeds of cattle and horses.

Livius
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Livonia.

Livonia. The following table shows the area of the cultivated and waste lands of Livland, according to the government commission of 1849:—

	Square Miles.
Arable land.....	1,740
Meadow.....	2,281
Private domains.....	2,251
Wood.....	4,026
Waste.....	7,847
Total.....	18,146

In the same year 449,484 qrs. of grain seed produced 2,033,904 qrs. of grain; and 131,605 qrs. of potato seed produced 244,509 qrs. of potatoes. Of live stock belonging to this government in 1849, there were 120,654 horses, 350,999 cattle, 315,195 sheep, and 148,945 swine.

Fishing and seal-taking are the occupations of the inhabitants of the sea and lake coasts. Manufacture may be said to be deficient, and in a rude state, being mostly confined to the home-spinning of wool and flax. Large quantities of grain and timber are yearly sent from this government by Riga to Western Europe, in return for coal, iron, salt, wine, &c. Game is plentiful, from the extent of the waste land. Bears, wolves, and foxes exist,—the latter in considerable numbers; while beavers, lynxes, squirrels, and martins, are hunted for their valuable furs. Aquatic birds frequent the lakes and marshes in great flocks.

Livonia, for administrative purposes, is divided into five circles, named after their respective chief towns, viz., Arensburg, Dorpat, Pernau, Riga, and Venden. The revenue of the government in 1849 amounted to L.586,444.

The population is a mixed race, composed of Livonians, Esthonians, Germans, Swedes, Russians, and Jews. The first, who occupy the southern portion of the country, are remarkable for their want of enterprise and great love of home. They are, however, of good disposition, and exhibit great mechanical ingenuity. Most of the trade is in the hands of the Russians and Germans, especially the former. Lutheranism is the dominant religion, while the Greek Catholics consist only of the few Russian residents. Riga, the capital, had in 1849 a population of 57,906 persons.

The history of Livland commences in 1158, when it was visited by some Bremen merchants, who established a trading post at the mouth of the Dwina, where Riga now stands. They found the inhabitants in an uncivilized and heathen condition; and in order to convert them to Christianity, instituted an order of religious knighthood, called the "Schwertbrüder," or Brothers of the Sword. These spread the gospel by force of arms, and claimed the Livonians as subjects as well as converts. In 1237 the "Schwertbrüder" united themselves with the order of German knights; retaining, however, their own grand-master as head of the band. From that year till the sixteenth century, Livland and Esthonia were under their control. But the Lutheran Reformation had then spread into the adjoining states, and both Livonia and Esthonia ultimately declared for the new faith. But at the time when Protestantism was struggling with the old religion, the Russians took advantage of the civil commotions that arose, and frequently invaded the land, receiving but slight resistance from the "Schwertbrüder," who had become too weak to protect their own territories. Gotthard Kettler, last grand-master of the order, abdicated his power over the province in favour of the King of Poland, and afterwards retired to Courland, which he received as a dukedom in return. But Poland did not enjoy her acquisition in peace, for the Swedes and Russians, as possessors of Esthonia, laid claim to Livonia, and soon appealed to arms in support of their demands. They were successful, and by the treaty signed at Oliva in 1660, Poland surrendered her possession to Sweden. In the next century, however, after Peter the

Great had defeated Charles XII. of Sweden, Livonia was finally given over to Russia, according to the treaty of Neustadt, in 1721.

LIVORNO. See LEGHORN.

LIXURI, a seaport town of the Ionian island Cephalonia, is situate on the W. shore of a large creek that runs inland from S. to N. It is the seat of a Greek bishop, and carries on a considerable trade. Pop. 6000.

LIZARD POINT, a bold headland on the S.W. coast of England, county of Cornwall, on the English Channel, N. Lat. 49. 57. 40., W. Long. 5. 11. 5. This is the most southern land in Britain, and generally the first sighted by vessels entering the Channel. It is surmounted by two fixed lights, the one 221 feet, and the other 225 feet above sea level. The rock is formed of hornblende and mica slate, and constitutes a rugged and precipitous coast. About a mile to the W. of the point is Old Lizard Head, with the dangerous rocks to seaward known under the name of the Stags. The *Ocrinum* of Ptolemy was either this head or Lizard Point.

LLANDAFF (*the Church on the Taff*), an ancient city, and seat of a bishopric of Wales, Glamorganshire, is situate on the right bank of the river Taff, about 2 miles N.W. from Cardiff. A church is said to have existed here from the period of the introduction of Christianity into Britain; but it does not appear that a bishopric was constituted until about the middle of the sixth century. The city is now only an insignificant village, claiming notice solely on account of its cathedral. This edifice, standing apart from the village in a hollow by the river-side, was begun by Bishop Urban in 1120, but not completed before the end of the thirteenth century. The prevailing style of the edifice is Gothic, but this is blended with much of early Norman, and some portions exhibit the architecture of later periods. The W. front is an admirable specimen of the early pointed style; and at the N.W. angle is a lofty square tower of the Tudor age, profusely enriched with sculpture. During the last few years extensive restorations have been made under the direction of Dean Conybeare. In the N. aisle are a number of curious monuments, with effigies of mailed warriors and mitred bishops; but the principal of these were much defaced or destroyed by Owen Glyndwr. Pop. of parish (1851) 1821.

LLANDEILO-FAWR, a market-town of S. Wales, Carmarthenshire, on the Towy, 14 miles E.N.E. from Carmarthen. The town is small and ill-built, and, excepting the new church, contains no important buildings. Near the town, in 1282, Llewelyn was defeated by the forces of Edward I., under the Earl of Gloucester and Sir Edmund Mortimer. In the vicinity is Dynevor Castle, built near the ruins of an ancient fortress of the same name, for a long period the residence of the princes of S. Wales. Adjoining the town is a valuable chalybeate spring. Several productive coal and iron mines in this district are connected by a railway with the port of Llanelly. Pop. of parish (1851) 5758.

LLANDOVERY (*Llan-ym-Ddyfri*, "Church among the Waters"), a municipal borough and market-town of S. Wales, in Carmarthenshire, about 23 miles E.N.E. from Carmarthen, in the valley of the Towy, near the confluence of that river with the Brân. The streets are irregular, and the only buildings worthy of note are, the parish church, several dissenting chapels, some schools, and the Welsh Educational Institution, founded and liberally endowed, in 1848, by Thomas Phillips, Esq. Near the town, on an insulated rock, is the keep of an old castle, built at a very early date, and dismantled by Cromwell. The vestiges of Roman roads, and the discovery of Roman coins, seem to indicate that Llandovery was once a Roman station. Market-days, Wednesday and Saturday. Pop. (1851) 1927.

LLANELLY, a municipal and parliamentary borough and market-town of S. Wales, county of Carmarthen, on

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Llanfyllin a rising ground near the Burry Creek, about 15 miles S.E. from Carmarthen, and on the railway between that town and Swansea. It is irregularly built, and has an antique parish church surmounted by two steeples, the one terminating in a spire, and the other in a parapet. The excellent harbour and docks of this town, its communication by railway with the rich coal-fields of the N.E., and its position on the verge of the mineral basin of S. Wales, have combined to raise it to its present prosperity, and promise soon to render it one of the most important ports of the principality. In addition to the iron and lead ore furnished by the neighbourhood, copper ore, imported from Cornwall, is smelted, and the manufactured metal is sent to Liverpool and other English ports. Great quantities of coal are also exported to France, Spain, and the Mediterranean. In 1855 there were exported from Llanelli to foreign countries, of British copper, 522 tons 14 cwt.; of lead and lead ore, 1815 tons; of coals, cinders, and culm, 24,118 tons. On the 31st December there were registered as belonging to the port, 40 sailing vessels of and under 50 tons, with a tonnage of 1103; and 41 above 50 tons, with a tonnage of 3915; steam-vessels under 50 tons 2, tonnage 36. During 1855 there entered the port of Llanelli, of British vessels, 1891, tonnage 118,383; of foreign vessels, 163, tonnage 10,555. There cleared out, of British vessels, 3152, tonnage 217,813; of foreign vessels, 165, tonnage 10,440. The inhabitants are chiefly employed in the lead and copper works, the iron foundries, and the mines. Market-days are Thursday and Saturday. The parliamentary borough is contributory to the Carmarthen district. Pop. of borough (1851) 8710.

LLANFYLLIN, a small market-town and parliamentary borough of Wales, in Montgomeryshire, on the River Cain, an affluent of the Vyrwy, 17 miles N.N.W. from Montgomery. The two chief edifices, both built of brick, are the town-hall and the church, the latter erected in the Venetian style, and possessing a fine peal of bells. The town is celebrated for its ale. Some Roman coins have been found here. The market-day is Thursday. There are six annual fairs, at which the celebrated "merlins," or Welsh ponies, are sold in great numbers. The borough is contributory to Montgomery. Pop. (1851) 1116.

LLANGFNI, a parliamentary borough and market-town of Wales, county of Anglesea, is situate in a fertile vale on the River Cefni, about 15 miles E.S.E. from Holyhead. At its annual fairs great numbers of cattle are sold for the English market. In the vicinity there are vestiges of a paved road supposed to be Roman. The borough is contributory to Beaumaris. Pop. (1851) 1362.

LLANGOLLEN, a town of Wales, in Denbighshire, is situate in a narrow valley watered by the Dee, on the high road between Holyhead and London, distant 184 miles from the capital. The town, mean and irregular in appearance, with streets narrow and ill-paved, is a favourite resort of tourists. Spanning the River Dee is a bridge of four narrow angular arches, built by Dr Trevor, Bishop of St Asaph, about the middle of the fourteenth century, and long remembered among the "seven wonders of Wales." On the summit of a high conical hill, about a mile from the town, stand the imposing ruins of *Castell Dinas Brân* or Crow Castle, a fortress of very ancient date. The remains of *Valle Crucis Abbey*, or *Llan Egwast*, founded about 1200, is 2 miles N.W. of Llangollen. In a meadow near the abbey stands *Elise's Pillar*, a round column covered with an ancient inscription of the seventh century, now illegible. The Ellesmere Canal is carried across the valley of Llangollen, and crosses the Dee about 4 miles from the town, by the Pont-y-Cyssyllte aqueduct of 19 arches and 126 feet in height. Its length is 1009 feet. The population are chiefly employed in manufacturing woollen and flannel stuffs, and in quarrying stone and lime. Llangollen is a

polling-place for the county, and has a market every Saturday. Pop. of parish (1851) 5260.

LLANIDLOES, a municipal and parliamentary borough and market-town of Wales, Montgomeryshire, is situate on the Severn, near its confluence with the Clywedog, 19 miles W.S.W. from Montgomery. The town consists partly of hovels built of wood and mud, and partly of recently erected houses, which are gradually replacing the old. The chief buildings are,—the new market-house, in the centre of the town, and the ancient church of St Idloes, remarkable for the ornamented pillars and the delicately carved oaken roof, which are said to have been transferred from Cwm Hir Abbey, in Radnorshire. There are extensive sheep walks on the surrounding hills, which supply the materials for the flannel manufacture, the chief source of the town's prosperity. The quarries of coarse slate, and the lead and copper mines on the slopes of Plinlimmon, employ a part of the population. A market for wool and corn is held on Saturday. The borough is contributory to the Montgomery district. Pop. of borough (1851) 3045.

LLANRWST, a market-town of N. Wales, partly in Carnarvonshire, but principally in Denbighshire, situate on both banks of the Conway, in a valley surrounded by well-wooded hills, 17 miles W.S.W. of Denbigh. The old church, an erection of the fifteenth century, and built on the site of a much older one, contains some interesting monuments. Inigo Jones furnished the design of the Gwydir chapel, in the south transept, which, among other curious relics, has the large stone coffin of Llewelyn the Great, son-in-law of King John. The bridge across the Conway was built in 1636, from designs by the same eminent architect. At one period, Llanrwst was celebrated for the manufacture of Welsh harps; there was also, somewhat later, a good deal of woollen-yarn spinning and stocking-knitting carried on, but neither of these is now of much importance. Coals and lime are brought up the river to Trefriw, and slate and iron sent in return. The markets are on Tuesday and Saturday. Llanrwst is celebrated for the excellence of its salmon-fishing. Pop. of parish 3984.

LLANTRISAINT ("the Church of Three Saints"), is an ancient parliamentary borough and market-town in Glamorganshire, Wales, 8 miles N.W. of Cardiff. The town, which stands on a hill commanding a view of the lovely vale of Glamorgan, the Bristol Channel, and the Devonshire hills, consists of only a few narrow winding streets. The church, dedicated to the three saints, is a large edifice in the Norman style. The most important modern buildings are the town-hall and market-house. There are remains of an old castle and of a monastery in the immediate vicinity of the town. The trade is unimportant; but coal, iron, and lead are found in the vicinity, and sent to Cardiff for exportation. It is a contributory borough to Cardiff. Pop. (1851) 1007.

LLERENA, an old walled town of Spain, province of Estremadura, 62 miles S.E. from Badajoz. The town is mean in appearance, and in a state of decay. Pop. 4990, chiefly engaged in agriculture. Near this, on 11th April 1812, Lord Combermere routed a French force under Drouot.

LLORENTE, DON JUAN ANTONIO, a Spanish historian and ecclesiastic, was born in 1756 at Rincon del Solo, near Calahorra, in Aragon. When he had been for some time a canon at Tarragona, he was made commissioner in 1785, and in 1789 secretary of the holy office at Logroño. His situation procured him an opportunity of acquiring an extensive knowledge of the Inquisition, of which he published a "Complete History;" but this drew upon him the displeasure of that institution, and he was imprisoned for a considerable period. In 1805, however, he was again appointed to an office in the Inquisition; and in 1806 he became canon at Toledo. But as he declared himself in favour of

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Joseph Bonaparte, and of certain innovations in Spain, he was forced to quit that country on the return of Ferdinand VII., and proceeded to Paris, where he lived by his writings. He was banished from France, and died on his way to Madrid in 1823. Besides the above-mentioned *History of the Inquisition*, which was published in Paris, 1817, 4 vols., his principal works are,—*Noticias Historicas de las tres Provincias Bascongadas*, Madrid, 1806–8, 5 vols.; *Memoirs relative to the History of the Spanish Revolution*, Paris, 1815–19, 3 vols.; *History of the Popes*, &c.

LLOUGHOR (Welsh, *Lluchwr*, supposed by some to be the ancient *Leucarum*), a parliamentary borough and port of S. Wales, Glamorganshire, on the E. bank of the Lloughor River, near its mouth, 7 miles W.N.W. of Swansea, with which it is connected by railway, and to which it is a sub-port. A very inconvenient ferry, long established here, has been superseded by a wooden bridge. Vessels of 200 tons can come up to the town. In the vicinity are collieries and copper-works. Lloughor is a contributory borough to Swansea. Pop. (1851) 821.

LLOYD, WILLIAM, Bishop of Worcester, the son of the rector of Tilehurst in Berkshire, was born there on 18th August 1627. He received his elementary education from his father, and at the age of eleven entered Oriel College, Oxford. Shortly afterwards he became a scholar of Jesus College, and was chosen Bachelor of Arts in 1642, and Master of Arts in 1646. In 1648 he was ordained deacon, and, after living in Berkshire as tutor in a gentleman's family, was presented in 1654 to the rectory of Bradwell. A dispute about the right of presentation soon induced him to resign this benefice. Ordained a priest in 1665 he was appointed in 1666 chaplain in ordinary to Charles II.; and in the following year became a Doctor of Divinity. After passing through several of the lower grades of church preferment, he was installed in 1672 dean of Bangor; and in 1676 was presented by the crown to the vicarage of St Martin's-in-the-Fields, the greatest cure in England. He was promoted to the see of St Asaph in 1680; and was one of the seven bishops who were imprisoned in the Tower in 1688, for refusing to publish in their pulpits the king's declaration for liberty of conscience. A thorough-going supporter of the Revolution, Lloyd was appointed almoner to William and Mary soon after their arrival in England. In 1692 he was translated to the see of Coventry and Lichfield; but was promoted in 1699 to the bishopric of Worcester, vacant by the death of Stillingfleet. He died at Hartlebury Castle, on the 30th August 1717.

Bishop Lloyd contributed many pamphlets to the controversy against Popery that was agitated during his time. Besides a few other tracts on ecclesiastical subjects, and several sermons, he published *A Chronological Account of the Life of Pythagoras and of his famous Contemporaries*, London, 1699, 8vo; and left unfinished *A Dissertation upon Daniel's Seventy Weeks*, and *A System of Chronology*. His friend Dr Burnet, in the *History of His Own Time*, eulogises Lloyd's amiable disposition, his ample and accurate knowledge, especially in chronology, and his skill as a Biblical critic.

LLOYD'S, a number of rooms in the Royal Exchange of London, frequented by underwriters, merchants, shipowners, ship and insurance brokers, and others, chiefly for the purpose of obtaining shipping intelligence, and of transacting business connected with marine insurance. The principal room is that of the Underwriters, in which two enormous ledgers lie constantly open,—the one containing notices of *speaking*, or ships spoken with, and arrivals of vessels at their various destinations; the other recording disasters at sea. All intelligence is entered immediately upon its reception, without removing the ledgers from their places, in order

Lloyd's.

that they may at any moment be inspected by those interested in their contents. At the inner end of the room is an ingenious piece of mechanism, by means of which the indications of an anemometer and an anemoscope are inscribed every hour in the twenty-four, by a couple of pencils, upon a sheet of white paper. The advantage to the underwriter, in the conduct of his business, of this information respecting the force and the direction of the wind, can scarcely be over-estimated. The underwriters are persons who, for a premium, grant an indemnity to merchants against risks by sea; and they are so called from the custom of *writing* their names *under*, or at the foot of, the policies of insurance. The method of *effecting* an insurance at Lloyd's is the following:—When a broker receives an order to insure interest to a certain amount in a particular ship, he writes upon a slip of paper the name of the vessel, the master's name, the nature of the voyage, the subject to be insured and its value, and any other information which the circumstances of the case may require. He then offers the risk to different underwriters until the value of the interest to be insured is exhausted, each underwriter subscribing his name opposite to the amount he engages to insure, and all agreeing to accept a uniform premium. The insurance is now virtually effected; the stamped policy being afterwards extended from this slip. This distribution of the risk among many individuals is, of course, very conducive both to the solvency of the underwriter and to the security of the insured. The number of underwriters is under 200; but some idea of the immense amount of insurance business done at Lloyd's may be derived from the fact, that the value of the interest annually insured at present is estimated at about £40,000,000. No person is permitted to transact business at Lloyd's as an underwriter or insurance-broker, until he shall have been duly admitted as a member, and shall have paid an entrance-fee. Communicating with the Underwriters' Room is the Chart Room. Here a valuable collection of charts, and the shipping intelligence as originally received, are carefully arranged, so as to be at all times easy of access. In this room also lie, for the use of members, four ledgers, in which the names of ships are arranged in alphabetical order, each name having under it all the information possessed regarding the vessel. The Merchants' Room is a place of resort for general news; it is, in fact, a news or reading room. The Captains' Room is employed as an auction-room for sales of ships, &c. Every person who enjoys the privilege of frequenting Lloyd's pays a fixed annual subscription.

The shipping intelligence received at Lloyd's is furnished by agents, who are appointed for the purpose; and as there is scarcely a port of any consequence where one is not resident, their number is very large. The information which each transmits to headquarters is regular, accurate, and complete. It is furnished by means of *letters*, signed by the agents, and by means of the newspapers and shipping lists which are published at the various ports;—the intelligence thus received consisting not only of a list of vessels which had arrived at, and which had sailed from, the particular ports, together with their accomplished and intended voyages, and of casualties which had occurred at or near the ports, but also of notices of ships spoken with, and of casualties at sea, furnished by vessels. No salary attaches to the office of agent for Lloyd's; the labour involved being amply recompensed by the business which it commands, and by the credit which the appointment confers upon its holder as a person of worth and respectability.

The intelligence, besides being made known to the members of Lloyd's by means of the ledgers, of which we have already spoken, is published every afternoon in *Lloyd's List* for diffusion over the country.

The management of Lloyd's lies with the subscribers, who select a committee from their number for the purpose, called the "Committee for managing the affairs of Lloyd's."

Lloyd's This committee appoints the agents and the officials of the establishment. The expenses connected with the establishment are defrayed by the fees and annual subscriptions.

Loango. The designation *Lloyd's* originated with a person of the name of Lloyd, who kept a coffee-house in Abchurch Lane, Lombard Street. From the vicinity of this house to the Old Royal Exchange, it speedily became a rendezvous of merchants for news, and for the transaction of business. It was afterwards removed to Pope's Head Alley, and thence again, in 1774, to the Royal Exchange. After the destruction of the Exchange in 1838 by fire, which originated in Lloyd's, the business was carried on in the South Sea House, in Old Broad Street, where it remained until the opening of the present Royal Exchange in 1844, when it was finally removed to its present splendid apartments. Similar establishments exist in our principal seaports.

LLOYD'S Register of British and Foreign Shipping, a volume published annually, and furnishing information respecting the nature of vessels, their class, place where built, materials, owners, captains, age, repairs, &c. The ships are registered according to the reports of salaried agents, appointed at various ports. The office of this *Register* is in White Lion Court, Cornhill, and is quite distinct from Lloyd's of the Exchange.

LO, St. a town of France, the capital of the department of Manche, is situate on the River Vire, 157 miles N.W. from Paris. In the central part of the town, occupying the top of a rocky eminence, is a square containing several of the principal buildings, while several irregular streets diverge from it, and cover the sides of the hill. The only structures of note are,—the Church of St Thomas, now used as a corn-market; the Church of St Croix, an ancient edifice in the early Norman style; and the Cathedral of Notre-Dame, defective and irregular in its architecture, but possessing two imposing towers and finely-painted windows. There are also a museum, a prefecture, a communal college, and a bridge of six arches over the Vire. The square called Champ de Mars is adorned with avenues of trees. Ribbons, linen, lace, drugget, and leather are manufactured; and there are some bleachfields and dye-works. Cavalry horses and cattle form the staples of trade. St Lo is the seat of tribunals of original jurisdiction and commerce, and of a chamber of manufactures. Pop. (1851) 9156.

LOANDA, an island situate opposite the city of St Paul de Loanda, at the distance of a mile. It is about 18 miles long by 1 broad. Besides the country houses of some of the wealthier persons in the city, the island has a number of villages. It produces abundant pasture for sheep and goats.

LOANDA, ST PAUL DE, a city on the coast of Angola, S.W. Africa, and the capital of the Portuguese settlements in this part of Africa, S. Lat. 8. 48., E. Long. 13. 8. It is built partly upon an eminence and partly on the sea-shore; the latter being occupied, for the most part, by the hovels of the black population. Loanda is the see of a bishop; and it was formerly celebrated for a cathedral, a very large Jesuit's college, and many other ecclesiastical buildings, most of which are now in ruins. It is defended by a large citadel and two smaller batteries. There is an excellent harbour about $3\frac{1}{2}$ miles long. The climate, which is very hot in summer, is yet considerably moderated by breezes from the sea. The country in the immediate vicinity produces large quantities of vegetables, fruit, and cattle; and water, which was at one period very scarce, is now brought regularly in boats from the Benga. Ivory and bees'-wax are exported. Pop. about 5000.

LOANGO, a country in the S.W. of Africa, stretching along the coasts of the Atlantic, between the equator and the River Zaire, bounded on the N. by Mayomba, and on the S. by Congo. Loango, the chief town, is, in S. Lat. 4. 39, E. Long. 12. 17. Along the coasts the country is

flat, and of great fertility. In some places it is said to yield three harvests in the year. Little is known of the interior, but many of the mountain ranges are said to be very fertile. The lakes and rivers are richly stocked with fish; the forests abound with game; and, in some places, panthers, leopards, elephants, apes, and antelopes are to be found; but horses and cows do not thrive. The only minerals of importance are iron and copper. Palm trees, sugar-cane, maize, pulse, yams, and potatoes are the principal vegetable productions. In some places the climate is good, in others it is said to be very unhealthy; there is, on the whole, little rain, but dew falls in large quantities. The power of the king is of the most absolute description. His majesty resides in Loango, the capital; and although there are many chiefs in the country who have considerable influence, he is regarded as the supreme authority. The revenue is principally derived from the sale of slaves.

LOBO, JEROME, a Jesuit missionary, was born in Lisbon in 1593, and entered the Order of Jesus at the age of sixteen. In 1621 he was ordered to resign the chair which he occupied in the College of Coimbra, and to repair as a missionary to India. After much delay, caused by adverse weather, he set sail in 1622, and arrived in the same year at Goa. With the intent of proceeding to Abyssinia as a missionary, he left India in 1624; but after disembarking on the coast of Mombas, and attempting to reach his destination by land, was forced to return. Repeating the attempt in the ensuing year, in concert with Mendez, the newly-appointed Patriarch of Ethiopia, and eight missionaries, Lobo landed on the coast of the Red Sea, and settled down in Abyssinia as superintendent of the missions in the state of Tigré. Here he remained for some years, until death deprived the Catholics of their protector, the Emperor Segued. Forced by persecution to leave the kingdom, in 1634 Lobo fell, along with his companions, into the hands of the Turks at Masowah, and was sent by them to India, to procure a ransom for his imprisoned fellow-missionaries. This object he gained, and at the same time endeavoured, though without avail, to persuade the Portuguese viceroy to send an armament against Abyssinia. Intent upon accomplishing this cherished project he embarked for Portugal, and after he had been shipwrecked on the coast of Natal, and captured by pirates, arrived at Lisbon. Neither at this city, however, nor at Madrid and Paris, was any countenance given to Lobo's plan for Christianizing Abyssinia by the aid of arms. He accordingly returned to India in 1640, and was elected rector, and afterwards provincial of the Jesuits at Goa. Returning to his native city in 1656, he continued there till his death in 1678. His *History of Ethiopia*, published in 1659, was translated from the MS. into French by the Abbé Legrande, Paris, 1728. Added to it was a supplement containing a history of the missions and expeditions to Abyssinia after Lobo's time, and several dissertations on the history and customs of that country. An English translation of Legrande's edition was published by Dr. Johnson in 1735, and reprinted in 1789.

LOBOS, or SEAL ISLANDS, two groups of guano islands in the Pacific Ocean, lying off the coast of Peru. The landward and northern group are about 20 miles W. of the mainland, in S. Lat. 6. 29., W. Long. 80. 53., and consist of one large island, 5 miles long by 2 in breadth, with several rocky islets. The seaward group lie about 38 miles from the mainland, in S. Lat. 6. 56., W. Long. 80. 55., and consist of two islands of about the same size, viz., 1 mile long by 1 in breadth, and separated from each other by a narrow channel. Both belong to Peru, although unsuccessful attempts have been made at various times by the United States government and private companies to obtain possession of them. On the N. group there is estimated to be a deposit of guano of about 400,000 tons, and on the other

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Lobos.

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Lochmaben

islands of more than 200,000 tons. The only inhabitants are those employed in the shipment of the manure, and consist chiefly of Indians and Chinese.

LOCARNO, a small town of Switzerland, and one of the three capitals of the canton of Tessin, is pleasantly situated at the head of Lake Maggiore, 8 miles S.W. of Bellinzona. It contains a government house, an old castle, and several churches. The climate is unhealthy, owing to the quantity of silt in the immediate vicinity, brought down by the numerous torrents which join the lake here. The inhabitants speak an Italian dialect. In March 1553 more than a hundred persons were expelled from the town for refusing to become Roman Catholics. Since then Locarno has decayed, as it was deprived by that expulsion of great part of its labouring population. Pop. 2676.

LOCATELLI, PIETRO, born at Bergamo in 1693, was sent when very young to study the violin under Corelli at Rome. His early career has not been recorded; but it appears that, after travelling as a distinguished violinist in Italy, Germany, France, and England, he fixed his residence at Amsterdam, where he established a public concert. At his death in 1764, the members of the Amateur Society of Amsterdam went into mourning. His compositions are full of new passages and difficulties unknown before his time, but they contain also many graceful and pleasing movements. His *Capricci* are excessively difficult; and it is evident that the celebrated Paganini had studied them carefully, and availed himself of the inventions contained in them. In command of the violin and knowledge of its resources, Locatelli far excelled all other violinists of that period. The Count Benvenuto di San Raffaele, royal director of studies at Turin, and an excellent violinist, published in 1784 *Letters on the Violin (Lettere, &c.)*, in which he writes in the highest terms of Locatelli's playing. The following list of Locatelli's published works is taken by the writer of this article from the list (down to opera 6) prefixed by Locatelli himself to his sixth work. The *Privilege*, at the end of the volume, is in Dutch, and dated at the Hague, July 24th 1731; "Opera 1^{ma}, XII. *Concerti*; Op. 2^a, XII. *Sonate per il Flauto Traversiere Solo e Basso*; Op. 3^a, *L'Arte del Violino, XII. Concerti con XXIV. Capricci*; Op. 4^a, *Sei Introduzioni Teatrali, e Sei Concerti*; Op. 5^a, *Sei Sonate a tre, a due Flanti Traversieri, con due Bassi*; Op. 6^a, XII. *Sonate a Violino Solo e Basso*. From this list and the *Privilege*, it is clear that Locatelli's Opera 6^{ta} was not first published in 1737, as has been erroneously stated, but in 1731. An edition was published at Paris in 1801. Op. 7^{ma}, VI. *Concerti a quattro*; Op. 8^{va}, VI. *Sonate a tre, due Violini e Basso*; Op. 9^{na}, *L'arte di nuova Modulazione*, the latest edition of which was published by Frey, at Paris, under the title of *Caprices*; Op. 10^{ma}, *Contrasto Armonico, Concerti a quattro*. (G. F. G.)

LOCATIO ET CONDUCTIO, is a contract made merely by consent, without employing any definite form of agreement. He who promises the use of a thing is *locator*; he who promises a sum of money for the use of it is *conductor*. Again, in giving services, or the result of labour for a fixed price, the person for whom the service is done is called *locator*; the person doing it *conductor* or *redemptor*.

LOCHGILPHEAD, a large village of Scotland, county Argyll, at the head of Loch Gilp, an arm of Loch Fine, 2 miles N. of the mouth of the Crinan Canal at Ardrishaig. It has churches belonging to the Established and other denominations, and a district gaol. The inhabitants are chiefly employed in the herring-fishery; and daily communication is maintained with Glasgow by steamers. Pop. (1851) 1703.

LOCHMABEN, a royal and parliamentary burgh of Scotland, Dumfriesshire, nearly surrounded by a number of small lakes, 8 miles N.E. of Dumfries. It has an Estab-

lished, a Free, and a United Presbyterian church, a town-house, and a young men's literary institute. The inhabitants are chiefly employed in the making of hosiery for the Dumfries manufacturers. Near the town are the scanty remains of an old castle, said to be the birthplace of Robert I. of Scotland. Lochmaben was made a royal burgh by that sovereign, and is governed by a provost, 3 bailies, and 9 councillors. It also returns one member to parliament in conjunction with the burghs of Dumfries, Annan, Kirkcudbright, and Sanquhar. Pop. (1851) 1092.

LOCHWINNOCH, a small manufacturing town of Scotland, Renfrewshire, on Calder Water, near Semple Lake, 14 miles W.S.W. of Glasgow by rail. It consists of four main streets, and contains several churches and schools. The inhabitants are chiefly employed in the cotton and wool mills of the place. Pop. (1851) 2271.

LOCK, MATTHEW, an English musical composer of considerable reputation and of eminent merit, was born at Exeter in the early part of the seventeenth century. The precise date of his birth is not known; some, however, are of opinion that it was in 1635. Connected with the choir of the cathedral of his native city, he received the rudiments of his musical knowledge from Wake, who then held the office of organist in that place. Lock had afterwards the good fortune to make the acquaintance of Edward Gibbons, under whom he completed those studies for which he had already contracted a passion under the instructions of the organist of Exeter. On the public entry of Charles II. into London, Lock was employed to write the music for that notable occasion, and performed his task so well, and with so much satisfaction to those in authority, that he was soon afterwards appointed composer to that prince. The first piece that appeared under his name was "A little consort of Three Parts, for Viols or Violins." There is also a very pleasing piece of vocal music by him entitled, "Ne'er trouble thyself about Times or their Turnings," among the collection of glees to be met with in Playford's *Catch that Catch can*.

In 1673 Lock came before the public in a somewhat different phasis of his art, and established for himself a true and abiding reputation. He wrote the instrumental music in Shakspeare's play of the *Tempest*, as it appeared during that year, and may be regarded, indeed, as the first musician in England who thus devoted his talents to the stage. He published the overture and airs to the *Psyche* of Shadwell in 1675, with an exceedingly violent preface, strongly marked by that unfortunate irascibility of which his cotemporaries found so much reason to complain.

It was about this time that the Rev. Thomas Salmon, A.M., of Trinity College, Oxford, and a notable mathematician, came forward with a plan for greatly improving musical notation. This proposal was a very desirable one, calculated to remove many of the difficulties which attend that branch of the art; and whether of the most perfect kind or not, would at least have cleared the way for a more complete and decided scheme of notation than the musical world as yet had the good fortune to obtain. It was not destined, however, to meet with the approval of the vehement composer of Exeter. In his pamphlet, entitled *Observations on a late Book called an Essay, &c.*, Lock loaded the scheme and its author together with the bitterest abuse, displaying an amount of personal feeling which led to the suspicion that he gave his opposition to the beneficial proposal of the mathematician more from motives of individual interest than from an unprejudiced conviction of its utility. A number of Lock's sacred pieces are to be found in the *Harmonia Sacra*, and in Boyce's *Collection of Cathedral Music*; but the great foundation on which his fame was reared is his music in *Macbeth*, "a lasting monument," says his biographer, "of the author's creative power and judgment." Lock died in 1677.

Lochwin-
noch
||
Lock,
Matthew.

LOCK.

Lock.

A Lock may be defined to be any kind of fastening which is intended not to be opened except by one particular instrument, called the key, or by some secret method of manipulation. The earliest lock of which the construction is known is the Egyptian, which was used 4000 years ago. In this drawing (fig. 1), *aa* is the body of the lock, *bb* the bolt, and *cc* the key. The three pins *p, p, p* drop into three holes in the bolt when it is pushed in, and so hold it fast; and they are raised again by putting in the key through the large hole in the bolt, and raising it a little, so that the pins in the key push the locking-pins up out of the way of the bolt. The security of this is very small, as it is easy enough to find the places of the pins by pushing in a bit of wood covered with clay or tallow, on which the holes will mark themselves; and the depth can easily be got by trial.

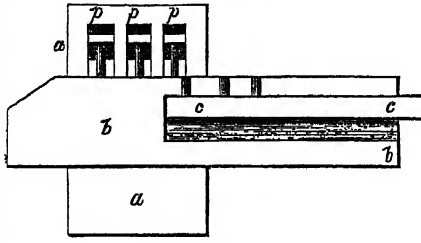


Fig. 1.

Mr Chubb, the well known lock-maker, has shown us a wooden Chinese lock which is very superior to the Egyptian, and, in fact, founded on exactly the same principle as the Bramah lock, which long enjoyed the reputation of being the most secure lock ever invented; for it has sliders or tumblers of different lengths, and cannot be opened unless they are all raised to the proper heights, and no higher. Until about eighty years ago, we had no lock so good as this in England. The locks then in use (fig. 2) were nothing better than a mere bolt held in its place, either shut or open, by a spring *b*, which pressed it down, and so held it at either one end or the other of the convex notch *aa*; and the only impediment to opening it was the wards which the key had to pass before it could turn in the key-hole. But you could always find the shape of the wards by merely putting in a blank key covered with wax, and pressing it against them; and when you had done so, it was by no means necessary to cut out the key into the complicated form of the wards (such as fig. 3), because no part of that key does any work except the edge *bc* farthest from the pipe *a*; and so a key of the form fig. 4 will do just as

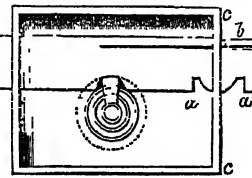


Fig. 2.

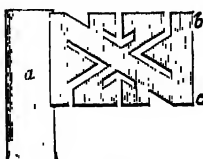


Fig. 3.

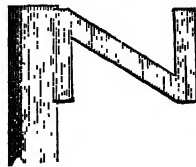


Fig. 4.

well; and a small collection of skeleton keys, as they are called, of a few different patterns, were all the stock-in-trade that a lock-picker would require.

The common single-tumbler lock (fig. 5) was rather better than this, as it requires two operations, instead of one, to open it. The tumbler *at* turns on a pivot at *t*, and has a square pin at *a*, which drops into a notch in the bolt

bb, either when it is quite open or quite shut, and the tumbler must be lifted by the key before the bolt can be moved again. But this, also, is very easy, unless the lock is so made that the tumbler will go into another notch in the bolt if it is lifted too high, as in the lock we shall now describe, and which is the foundation of all the modern improvements in lock-making.

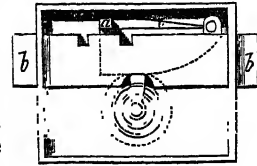


Fig. 5.

Common
Tumbler
Lock.

Barron's Lock.—Fig. 6 is a front view, and fig. 7 a horizontal section, of Barron's lock, which was patented in the year 1778. First consider it with reference to one tumbler, *at*, only.

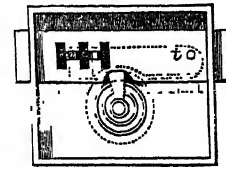


Fig. 6.

You see that unless the square pin *a* is lifted by the key to the proper height, and no higher, the bolt cannot move, and that alone adds very considerably to the difficulty of picking, except by a method not discovered for many years after. But besides that, Mr Barron added another tumbler, and unless both were raised at once to the proper height, and no higher, the lock could not be

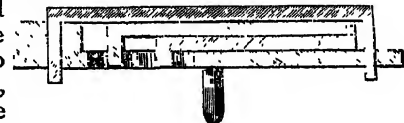


Fig. 7.

opened. We are not aware that Barron himself ever went beyond two tumblers; but the principle of the many-tumblered lock is undoubtedly his, and nothing that was added to it for nearly eighty years afterwards made any material addition to its security. But instead of making a separate pin to each tumbler, and a corresponding number of notches in the bolt, the simpler plan was adopted by other makers of putting what is called the *gating*, in the tumblers, and a single pin in the bolt, which is then called the *stump*; this will be shown presently in the drawing of Chubb's still more famous lock. The face, or working edge, of the key of a many-tumblered lock assumes this form (fig. 8), the steps corresponding to the different heights to which the tumblers have to be raised, and one of them acting on the bolt, and they may have a much wider range of difference than in this figure. The key here drawn is also one with the wards of such a shape that no skeleton except itself can pass them. The form, however, can be got in the usual way by a wax impression; and as it weakens the key very much, and is expensive to cut, it is not often used.

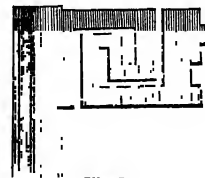


Fig. 8.

Bramah's Lock.—The next lock of any importance was Bramah's the celebrated lock originally patented, just ten years after Lock.

Barron's, by the late Mr Joseph Bramah, who came up to London from Barnsley as a joiner, and raised himself to eminence by the invention of this lock, of the machine for numbering bank-notes, the beer-engine, the water-closet, the pencil-cases called "ever-pointed," and, above all, the hydraulic press—an invention which, like Nasmyth's steam hammer, extended the powers of man beyond what before had been conceived possible. In figures 9 and 10, *aaaa* is the outer barrel of the lock, which is screwed to, or

Bramah's Lock. cast with the plate; *cccc* is a cylinder, or inner barrel, turning within the other. It is shown separately at fig.

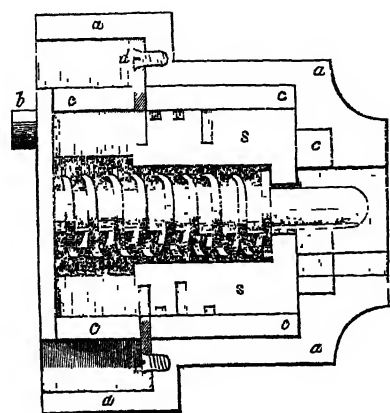


Fig. 9.

11; and fig. 12 is a cross section of it, the black ring being the keyhole, and the light spot in the middle the

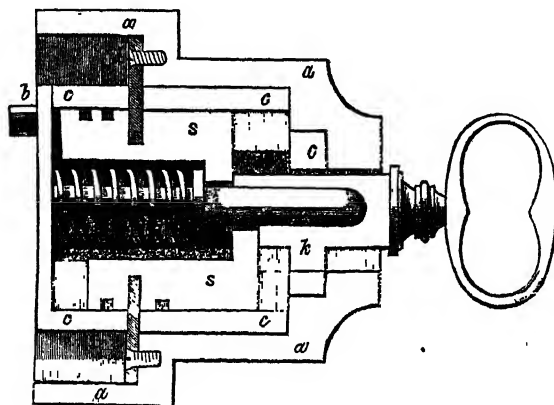


Fig. 10.

drill-pin, which goes into the key. The short pin *b*, in figs. 9, 10, 11, is set in the end of the cylinder, near its edge; and when the cylinder turns round, that pin shoots or draws the bolt, by acting in a slit of the form shown in fig. 13. The security of the lock depends upon a number of sliders, *s*, of which the shape is shown in fig. 14, and the cross section in fig. 12. They are made of plates of steel doubled, and sprung open a little, so as to make them move with a little friction in the slits of the cylinder or revolving barrel in which they lie, and are pressed up against the cap of the lock by a spiral spring. They are shown so pressed up in fig. 9, and pressed down by the key in fig. 10. There is a deep groove cut round the barrel; and in each of the sliders there is a deep notch which can be pushed down to that place in the barrel by a key slit to the proper depth; and it is evident that when all the sliders are pushed down to that position, the barrel will present the appearance of having no sliders in it. A steel plate (fig. 15), made in two pieces in order to get it on, embraces the barrel at the place where the groove is, having notches in it corresponding to the sliders,

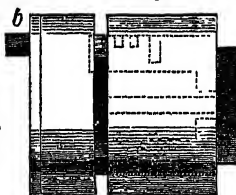


Fig. 11.

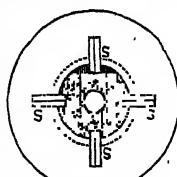


Fig. 12.

and is fixed to the body of the lock by two screws marked *d, d* in figs. 9, 10, and 15. When the sliders are pushed up by the spring, they fill the notches in the plate, and prevent the barrel from turning; but when they are pushed down by the key, the notches in the sliders all lie in the plane of the plate, and so the barrel can turn with the key, and the pin *b* in the end of it drives the bolt as before described. The key, as every one knows who has seen a Bramah key, has a *bit*, *k*, sticking out from the pipe, the use of which is to fix the depth to which it is to be pushed in, and then, as the bit

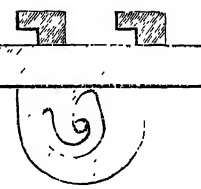


Fig. 13.

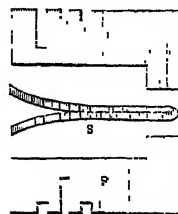


Fig. 14.

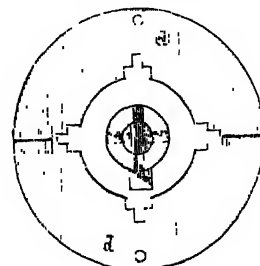


Fig. 15.

slips under the cap of the lock, it keeps the key at the same depth while you are turning it.

This was the construction of the lock for a good many years, and Mr Bramah pronounced it in that state "not to be within the range of art to produce a key, or other instrument, by which a lock on this principle can be opened." It was found, however, long before the defeat of the improved challenge Bramah Lock by Mr Hobbs in 1851, that the inventor had made the common mistake of pronouncing that to be impossible which he only did not see how to do himself. As it has been generally supposed that what is called the tentative method of lock-picking was unknown here before it came over from America in the year of the great Exhibition, we must remind our readers that it was described in the last edition of this work nearly thirty years ago; though, no less fortunately than strangely, the lock-picking fraternity were not of sufficiently literary habits to make themselves acquainted with it. Mr Hobbs, it is true, carried the process farther than had been supposed possible before; but all the Barron and Chubb, and other many-tumbled locks, which were supposed impregnable, might long ago have been opened by anybody who had paid attention to the method by which the Bramah locks were known to have been picked some forty years ago, before the introduction of the *false notches*, designed by Mr Russell in 1817, then one of Mr Bramah's workmen. If you apply backward pressure to the bolt of a tumbler lock when locked, or twisting pressure to the barrel of a Bramah lock, first pressing down the spiral spring, there will be a greater pressure felt against some of the tumblers or sliders than against others, in consequence of inevitable inequalities of workmanship; and if you keep the pressure up, and gently move any of the tumblers or sliders on which the pressure is felt, you will at last get it to some point where it feels loose. That may or may not be the exact place to which the key ought to lift it; but as soon as you feel it loose, leave it alone; it will not fall again, as the friction is sufficient to prevent it; and, if necessary, you may fix it there by a proper instrument, or measure the depth, and keep the measure till you begin again. Then try another tumbler which feels tight, and raise it till it also feels loose. And if you go on in that way, always leaving the loose tumblers alone, and raising the one which feels tight, they will at last all be got into the position of complete freedom, *i.e.*, to

Bramah's
Lock.

Bramah's
Lock.

the place where the stump of the bolt can pass them. The operation is just the same in principle in the Bramah lock and in tumbler locks: only, as all the sliders are acted on by one spring in the Bramah as now made, you need only just push down that spring, and hold it there, and then the sliders may be moved freely either way by means of a hook or a small pair of self-acting forceps to pull them up if they accidentally get pushed too far. At first each slider had a separate spring.

False
notches.

But if the sliders have some false notches in them not so deep as the true ones (see fig. 14), and the corners of the notches in the plate *dd* are cut out a little (as in fig. 15), then you might by trial get all the sliders into such a position that the barrel could turn a very little, but no more; and when it is turned that little, you cannot push the sliders in any farther, and so (as was long supposed) the tentative process is defeated; and undoubtedly it is made much more troublesome, but it only requires more time and patience. You can still feel that the pressure is greater against some one or more of the tumblers or sliders than against others; and wherever that is the case, you know that it must be at a false notch, and not the true one, for a true one gives no pressure at all. Proceeding in this way, Mr Hobbs opened the challenge-lock with eighteen sliders, or guards, which had hung in Messrs Bramah's window for many years, in nineteen hours, and would have done it sooner, but that one of his instruments broke in the lock. He afterwards repeated the operation three times within the hour, in the presence of the arbitrators; and we have seen him open a more recent one with eight sliders in four minutes, by means of an instrument which is equivalent to a Bramah key with adjustable slits, which are set to the sliders as he goes on feeling them and getting their depths. It has been stated as an advantage of the Bramah lock, that an impression cannot be taken from it. This is a great mistake. Mr Chubb showed us a small instrument, which a man could hold in his hand without it being seen, and by which an exact impression of the depths of any Bramah key, whose number of slits is known beforehand, can be taken in a moment, and the other end of the instrument then becomes a key which will open the lock at once.

It is moreover to be remembered, that thieves do not always confine themselves to the conditions of a challenge, in which force and injury to the lock are of course prohibited; and if a lock can be easily opened by tearing out its entrails, it is of very little use to say that it would have defied all the arts of polite lock-picking; and in this respect the Bramah lock is singularly deficient; for if the exposed cap or nozzle of the key-hole is cut off, as it easily may be, or the hole widened out by a centre-bit, the sliders can all be pulled out, and there is an end of the lock. But, as a protection against picking by pressure without violence, Mr E. B. Denison suggested an alteration, of which a specimen was made in 1853 by Messrs Mordan (who are now the largest manufacturers of Bramah locks), on the principle of Mr Hobbs's moveable stump for tumbler locks. The locking-plate is not screwed to the body of the lock, but is left free to turn a little; and if it is turned by putting any pressure on it from the sliders, it pushes a click CC (fig. 16) into a notch in the barrel and holds it fast, and so no pressure of the sliders can be felt. In this case, the locking-plate is made in one piece, and the barrel in two. If that contrivance had existed in Messrs Bramah's challenge-lock, it could not have been picked by Mr Hobbs's method. However, locks for securing property well worth stealing must be safe against rude as well as polite lock-picking, and this the Bramah

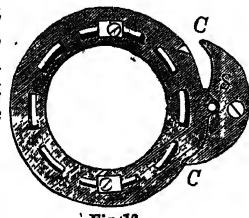


Fig. 16.

lock hardly can be made; and therefore it must be admitted, that, even with the above-mentioned improvement, it is now behind the requirements of the age, though the smallness of the key, and the cheapness with which they can be manufactured and sold to the trade (though they are not yet sold by retail as cheap as some other better locks), will probably enable them to keep their place for some time.

Bramah's
Lock.

Inside and Outside Locks.—Locks for drawers, closets, iron chests, and the like, are only required to lock on one side, and their keys are therefore made with a pipe, which slips on to, and turns on a pin in the lock, called the *drill-pin*. But doors which have to be locked sometimes on one side, and sometimes on the other, cannot have their keys made in this way; but the key is solid, and its plug or stem being thicker than the flat part or web, it acts as an axis fitting into the upper part of the key-hole, though that hole does not completely inclose it. All keys for these inside and outside locks must be symmetrical, or alike on each side of a line through their middle, in order to fit the lock either way, which limits the variety of the tumblers in the case of many-tumbled locks. A Bramah lock, to open on both sides, must be made double, with one set of sliders to push in from one side of the door, and the other set from the other side; and, consequently, they are very seldom used for this purpose. It may be convenient to observe, that when we use the term Bramah lock, we mean a lock of that construction; for the patent having long ago expired, they may be made by anybody, just as Chubb's lock may, though nobody but the representatives of the original patentees has a right to apply the name *Bramah* or *Chubb* to them; and therefore Messrs Mordan, for instance, rightly call them by their own name, though their locks are the same as Bramah's, except that they generally make the number of sliders odd, while Messrs Bramah make it even.

Cotterill's Lock.—The lock of Mr Cotterill of Birmingham is on the same principle as Bramah's, the difference being, that the sliders are pushed out radially by a very thick key with inclined slits in it. The locking-plate is a ring instead of a flat plate, and the notches in the sliders have all to be brought into the same circle, to be able to pass along the ring. Some of the sliders are made into what are called detectors, being held by a spring catch, if they are pushed out too far. This is the primary form of Cotterill's lock; and in that form it is evidently quite as easy to pick as the commonest form of Bramah lock, and easier, because the

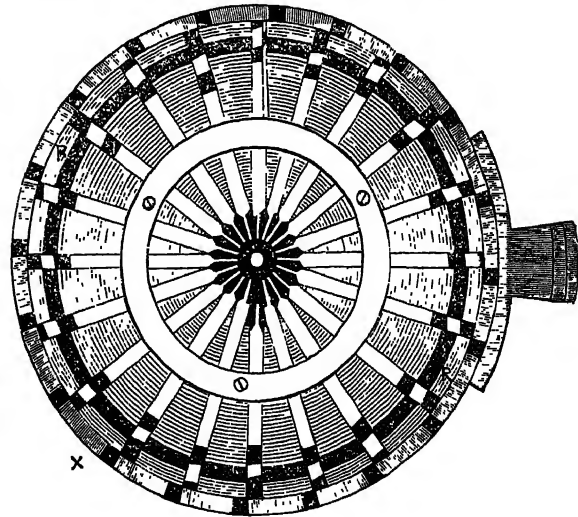


Fig. 17.

range of the sliders is necessarily very small, as the extreme range can be no more than the thickness (not the diameter)

Cotterill's
Locks.

of the key-pipe. But Mr Cotterill afterwards added a second ring X (fig. 17) outside the fixed locking-ring RR; and in that outer ring you observe that the notches are not quite opposite to the ends of the sliders, some of which are bevelled; and therefore, when pushed out by the key, they will force themselves into the notches of the outer ring, and turn it a little against the resistance of a spring, which tends to keep it in the position shown in the drawing with reference to the cylinders and sliders. When it is so pushed a little out of the way by the bevelled sliders, the square-ended ones can enter the holes then opposite to them, and so carry their own notches into the position to pass the inner or fixed ring, and then the cylinder can turn, and it carries the outer ring with it. Moreover, in the latest form of this lock, the inner ring is not absolutely fixed, but has a little play, like the plate of the improved Bramah lock in fig. 16; and by the side of it there is a click, CC, which any slight turning of the ring brings into action, and makes it lock the ring fast. This appears, from Mr Cotterill's description and drawing, to be just the same contrivance which we have already described as being applied by Mr Denison to the Bramah lock to prevent feeling the pressure of the sliders on the locking-plate; only this appears to lock into the ring itself, and therefore would not prevent the pressure from being felt; whereas Mr Denison's click for the Bramah lock fastens the barrel, and does prevent the pressure. But that could easily be done in the same way in Mr Cotterill's lock; and, if so done, it would, as far as we can see, be of much more value than the second ring, as we shall explain presently. The entrails of this lock could not be taken out, like Bramah's, by merely cutting off the nozzle.

This lock acquired some celebrity, from having defeated Mr Hobbs in a challenge to pick it. But from the printed account of the affair, sent to us by Mr Cotterill himself, it is clear that that failure proved nothing, except that Mr Hobbs was taken by surprise, and supposed that he was picking one of Cotterill's locks as they had been made before the invention of the second ring, and such as he had publicly exhibited a mode of picking with merely a piece of wood; whereas the lock in the trial contained these other arrangements, which Mr Hobbs knew nothing of. It is certainly added, in the printed account, that, when he did see the additions, he confessed that he did not then see how such a lock was to be picked, and declined to try it. Whether it really is invincible in its present state we are not able to say, not professing to be lock-pickers ourselves; but it does appear to us that the inventor considerably overstates the difficulty when he says all the sliders must be moved together; for it seems plain that pushing out any two nearly opposite sliders with the bevelled ends would turn the outer ring as well as a dozen; and as soon as it is turned a little it is of no further use. No doubt all the sliders must be at last brought together into the proper position, as they must in any other lock; but that is a very different thing from requiring them all to move simultaneously into that position. And whether the lock is impregnable or not, we should imagine that the great thickness and weight of the key, which is necessary to get even a moderate range in the sliders, would generally be considered an objection to it, as we have the best authority for saying, that in some other cases the highest amount of supposed security will not induce even bankers to adopt locks with large keys.

Letter
Locks.

Letter Locks.—It used to be supposed, some years ago, that locks which could only be opened by setting a number of rings or discs to a particular combination of letters could not possibly be opened by anybody who was not in possession of the secret; and hence they were also called *puzzle-locks*. At first they were made with a fixed combination, which could not be changed. Afterwards the rings were made double, the inner one having the notch in

it which the bolt had to pass, and the outer one capable of being fitted on to the inner in any position, by unscrewing some part of the lock, so that you might set them to any combination you like. This was the first instance of a changeable lock, of which we shall have more to say at the end of this article. But it was afterwards found that these puzzle-locks have just the same vulnerable point as all our locks had until lately, viz., that the pressure of the bolt can be felt on some of the rings more than on the others; and Mr Hobbs says emphatically, in the *Rudimentary Treatise on Locks*, "wherever that is the case, that lock can be picked." We have heard an amusing account of his opening, in a few minutes, a great dial lock on an iron door at Liverpool; and also opening a French lock in the Great Exhibition, and setting it to a new combination, so that the exhibitor himself could not open it. Besides this defect, these locks have very much gone out of use on account of their being troublesome to handle, and perhaps also from the risk of forgetting the combination to which it was set last, if the lock has been left for some time; and therefore we do not think it necessary to go further into the details of their construction: the principle of it we have described sufficiently to make it intelligible.

Letter
Locks.

Chubb's Locks.—Of the multitude of locks which have Chubb's been made on the many-tumbler principle, originally invented by Barron, none have enjoyed so much celebrity as Chubb's, partly from their superior workmanship and use of more tumblers than usual, and perhaps still more from the late Mr Chubb, or his brother, who took out their first patent in 1818, having had the good fortune to hit upon the name *Detector* for a certain part of the machinery, which, besides adding to the security against any mode of picking then known, also captivated the public with the idea of discovering if anybody had been tampering with the lock, though the operator might depart in ignorance that he had left any trace of his attempt behind him. It is remarkable that the detector was not even then a new invention; for a lock exactly the same in principle, but slightly different in arrangement, had been previously made by a Mr Ruxton. In the same way false notches were used in Strutt's tumbler lock above thirty years before they were re-invented by Chubb and others, with the idea of defeating the tentative method of picking by them. The original form of this invention is shown in fig. 18 by the lever DT,

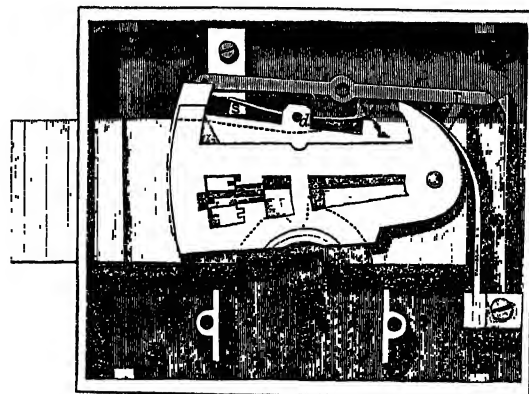


Fig. 18.

which turns on a pin in the middle, and is acted upon at its end T by a spring S, which will evidently allow some play to the lever on either side of the corner X, but the moment it is pushed past that point, the spring will carry it farther in the same direction, like what is called in clock-work a *jamper*. In its proper position that end always remains above the turning-point; but if any one of the tumblers is raised too high, the other end D of the detector, which reaches over all the tumblers, is lifted so far that the end T is sent down below the corner, and the tooth T then falls

Chubb's
Locks.

into a notch in the bolt, and so prevents it from being drawn back, even though all the tumblers are raised properly by the right key, which at once reveals that somebody has been trying to pick the lock. The way to open it, then, is to turn the key the other way, as if to overlock the bolt: you observe a short piece of gating near the end of the tumblers, to allow the bolt to advance a little, *i.e.*, just far enough to push the tooth of the detector up again by means of its inclination there, and then the lock can be opened as usual. In Mr Chubb's more recent locks the tumbler is made in another form. The back tumbler, or the one which has to be raised highest, has a pin *d* reaching over all the others, and if any of them are overlifted, that back tumbler is also, and then a square corner *k* in it gets past the end of the detector spring *ks*, and is held up. It is set right by overlocking the bolt as before, the bolt itself raising the end *k* of the spring, and letting the tumbler fall. This form of detector is, however, inferior to the other, as it informs the picker what he has done, by the back tumbler itself being held up, which he can feel directly.

But since Mr Hobbs's mode of picking locks became known, all these detectors have become useless. Some persons have even gone so far as to say that the detector may be made a guide to picking. Whether this be so or not, the detector does not act unless some of the tumblers are raised too high, which they never are by a skilful operator on this plan, nor does it act (even if thrown by accident) against picking backwards, or feeling the way to shoot the bolt a little farther, as if to free the detector; and in this way, at any rate, the measure of the key can be taken without any hindrance from the detector. Before 1851 tumbler locks were seldom made with false notches; we remember, however, seeing a lock on an iron door, invented by a Mr Strutt many years ago, in which the tumblers were in the form of quadrants, with a very large angular motion, and a number of short or false notches and one deep one. But since that year Mr Chubb and some other makers of tumbler locks have adopted false notches in all their best locks, together with revolving curtains, which cover the straight part of the key-hole as soon as the key is turned; and barrels going down from the back of the curtain to prevent a false key or pick from turning without turning the curtain; and other obstacles, of which the object is in all cases to prevent the maintaining of pressure of the stump upon the tumblers at the same time that the tumblers themselves are moved, or, as Mr Hobbs has called it, tickled, by some other instrument. These provisions, and especially a number of small false notches (which may be got with a thick stump by serrating the end of it), undoubtedly make the locks much more difficult to pick; in fact so difficult, and requiring such nicety of instruments and manipulation, that they may be considered practically safe, except under extraordinary circumstances. But then it must be remembered that all the great robberies, of which there are several every year, do present extraordinary circumstances, and that they are never attempted except where the temptation has been made great, by the thieves seeing that they had unexpected facilities offered them. It is therefore by no means safe to assume that a lock will never be picked, merely because it would take a first-rate hand a long time to do it. The process need not be continuous. A good hand will do part of his work, and measure it, or mark it off upon his false key, one day, and more another, until it is all done, and his key ready for action at the first convenient opportunity. Recent experience has shown that your own officers, clerks, and servants are the people from whom you have most to apprehend, and they are just the people who have the most time and opportunity to perform their key-making operations undisturbed. Without going into all the mechanical details (which it is perhaps as well not to publish), it is enough to say, that the lock of the United States Bank, which was

almost as complicated as the famous one of Day and Newell, and contained all the false notches, revolving curtains, and other provisions which have been several times re-invented or put out as novelties here, was nevertheless picked for a wager.

We shall now describe the principal inventions that have been made within the last few years, with the view of defeating that tentative method of picking to which all our locks, as constructed before 1851, were and are liable; and we shall point out which of them really do effect that object, and may be regarded as absolutely secure against any mode of picking at present known; and which of them may be regarded as safe enough for ordinary purposes, though not coming up to the mark of absolute security.

Hobbs's Lock.—The invention which most directly meets the defect of all previous locks is Mr Hobbs's moveable stump, which, it must be observed, is a totally different thing from the great twenty-guinea American lock of Day and Newell, which also goes by his name here, because he makes and sells them. In Hobbs's lock, the stump is not rivetted

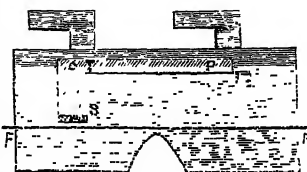


Fig. 19.

into the bolt as usual, but is set on the end *S* of a bent lever STP (fig. 19), which lies in a hollow of the bolt behind it, turning on a pivot in the bolt itself, and kept steady by a small friction-spring, not shown in the drawing. The stump comes through a hole in the bolt large enough to let it have a little play; and the long end *P* of the lever stands just above the edge of a square pin, which is fixed in the back plate of the lock. When the lock is locked, if you push the bolt back, you produce no sensible pressure on the tumblers, but only just enough to turn this protector lever, as Mr Hobbs calls it, on its pivot *T*, and so bring down its end *P* in front of the square pin, and then the bolt can no more be pushed back than when held by Chubb's detector. The protector is set free again by merely pushing the bolt forward with the key, without reference to the tumblers. It was found however, that in this state, the protector could be prevented from acting by a method used by Mr Hobbs himself for another purpose, *viz.*, pushing a piece of watch-spring through the key-hole, and up behind the bolt, so as to reach the protector at *P*, and keep it up while you push the bolt back; or, again, by pushing up the watch-spring between any two of the tumblers, and holding the end *S* of the protector with it, so as to press the stump against the tumblers. Both these devices, however, are prevented now by letting in a feather *FF* in a groove between the bolt and the back of the lock, which no watch-spring can pass, and also bringing a piece of the feather forward through the front gating of the tumblers just under the stump. In this form the lock is safe against any mode of picking at present known, unless the key-hole happens to be large enough to admit the inspecting method, which is this:—A person intending to pick the lock goes beforehand and smokes the bellies, or lower edges of the tumblers, through the key-hole. When the key comes, it wipes off the black on each tumbler, according to the length of the bit which raises it; and then, when the picker returns, he throws a strong light into the key-hole, and, by means of a narrow reflector put into it, reads off, as it were, the length of bit required to raise each tumbler to the proper height. This operation may sound impossible; but it is an established method of lock-picking, at least in America, where they seem to be considerably ahead of us in these matters. It requires a largish key-hole, however; and it may be prevented by any kind of revolving cylinder, which will conceal the view of the tumblers while the key-hole is open. The one that does it most completely is the eccentric cylinder, which will be described in the great American lock. The inspecting

Hobbs's
Lock.

Parnell's
Locks.

method might also be frustrated by making the acting part of the bellies of all the tumblers no longer than would be reached by the shortest bit in the key. In that case, the long bits would not begin to act at their points, but on their sides, and would leave no measure of their length upon the tumblers.

There is another lock invented by Mr Hobbs, also belonging (as far as we can see) to the absolutely secure class; but it will be more conveniently described after we have noticed the changeable key-locks.

Parnell's Locks.—The next contrivance for preventing the tentative mode of picking is that invented by Mr Parnell (fig. 20), and now sold by a Mr Puckridge, with whom Parnell was in partnership for some time, but has now left that firm, and set up

for himself at another shop, with a later invention of his own, which we shall describe presently. His first lock acquired some celebrity from a trial at law, in which it appeared that a certain Mr Goater, who worked for Mr Chubb, had

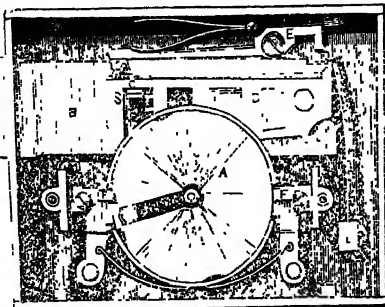


Fig. 20.

claimed 200 guineas for picking a challenge lock of Parnell's,—the fact being, that he had first clandestinely taken the cap off and made a false key, and then pretended to pick it. But the trial proved no more in favour of it than the pretended picking proved against it; for there was no proof that the lock could not be picked by other means; and we cannot think it would present much difficulty to those who can pick such locks as Jones's American bank-lock, before alluded to, though it would probably defeat the ordinary race of lock-pickers.

The most important features in this lock are, the lever E at the top, which is called a *double-action latch*. It is, in fact, Chubb's detector, with the addition of the tooth on the left hand, which falls into the bolt and prevents it from being pushed back against the tumblers, except when it is raised by them, or any one of them, just enough to clear the bolt, and no more; for if raised too high, it locks into the bolt at the other end, like Chubb's first detector. But it is evident that this is worth very little by itself; for you have only to put the pressure on the bolt, and then gently raise the lever by one of the tumblers until the bolt will either clear it completely, or, at any rate, press against some of the tumblers, and then proceed as usual. But then another lever is added. You observe a line across what appears to be the stump S. The part below the line is the real stump; but the part above it is a kind of second stump set on a tumbler behind the others, and not touched by the key, but pressed upwards by a weak spring, so that it can only rise when all the tumblers are lifted. This *self-acting lever* also ends in a square corner, which butts against the real stump when it is down; so that, if you push the bolt back, you bring the stump against the self-acting lever, and not against the tumblers. All this looks very formidable; but on examining one of these locks, it occurred to us at once, that if you only lift all the tumblers a little, so as to let the self-acting lever rise out of the way of the stump, and then (but not before) push the bolt back, you have disposed of the lever just as much as if it did not exist; and on trying it, we found the operation perfectly easy. Of course, it would require more care and delicacy to manage the "double-action latch" and the "self-acting lever" together than either of them separately; but they are only

used together in the most expensive of these locks; and, moreover, it is a maxim in lock-picking, that a mere multiplication of difficulties does not produce impossibility, and that no number of approximate or partial securities amount to one absolute security.

The mode of operation just now described will defeat equally well a self-acting tumbler, on the same principle, which Mr Chubb added to his locks soon after Mr Hobbs's demonstration, in 1851, of the insecurity of his and Bramah's, and, indeed, of all the then existing English locks. Mr Parnell (or Puckridge) also uses, in his large locks, a revolving curtain and cylinder, or barrel, which covers part of the key-hole, and the web of the key expands as it turns; for, when the key is out of the lock, it looks like a blank, with no bits projecting. But all these things, and the double-action latch too, are all old inventions, as may be seen in the *Rudimentary Treatise*, and more fully in Mr Price's large book on *Fire-proof Safes, Locks, and Keys* (published since this article was written), which is the most complete treatise on the subject ever published in this country; though even in that some of the descriptions are so brief as to be hardly intelligible, in consequence of the enormous number of inventions—nearly all patented, and most of them useless—which have been made for the improvement of locks within the last forty years. Besides being an old invention, an expanding key is very limited in the range or variety of the bits, expensive, and unpleasant to work on account of the increased friction. The pieces marked FF (in fig. 20) are called *sentinels* by the inventor, and they are intended to prevent the cylinder from turning beyond a certain point with a false key, and also to prevent the false key from getting out again. This, too, has been done before, and on the same plan, of preventing any key, whether true or false, from returning; and so, if it cannot go forward and open the lock, it is held fast, as evidence of its own intrusion, like Cassim in the cave of the Forty Thieves. But when the inventors of these things talk of the "frightful consequences" of having to smash the door in order to get the false key out, they forget that the key is not the thief, and that these consequences are rather amusing than frightful to the person who left it there, who will have the satisfaction of knowing that he has, at any rate, done as much mischief as possible, by way of paying off the owner for not providing him with a lock more easy to pick. It is also to be remembered, that if the owner himself carelessly puts a wrong key into the lock, or if there is a piece of dirt sticking to it, which may prevent it from opening the lock, the consequences are equally unpleasant. The detention apparatus clearly adds nothing to the security. If the "sentinels" really do their other duty of preventing the cylinder from turning beyond a certain point except with the true key, you want nothing more, and get nothing more, by detaining an intruding key; and if they can be held or thrown out of action (as we rather suspect they can), that, of course, would be the first thing a skilful lock-picker would do. We do not mean to say that a lock with all these complicated provisions could be picked under several hours, if at all. But it does not seem to us in the least degree more secure than Mr Hobbs' much simpler and cheaper contrivance of the moveable stump, or than some others which we have not yet described. And it is necessary to caution the public against *shop-window* locks in general, with large wagers set upon them; for unless you know that the lock exhibited in the window is the same as those usually sold in the shop at a moderate price, and unless the conditions of the challenge (which are generally "to be had within") are fair (we have seen some that were utterly unfair and absurd), the offer of "200 guineas to the artist who can pick this lock" does not prove that any other lock in the shop is worth 200 pence; and it is, in fact, nothing but a mere advertising trick.

Mr Parnell's other lock, sold by himself only, has the

Parnell's
Locks.

Parnell's
Lock.

advantage of being much cheaper, and at least as secure as the one with the self-acting lever and expanding key, which is the ordinary construction of the locks under his former patent. This lock has also the revolving curtain, and there is a small ring B (fig. 21) on the under side, which incloses a deep circular ward set in the back of the lock, which requires a very deep cut in the key, so that there would be very little room for a pick to play in. These two features are not claimed by Mr Parnell as novelties, and, in fact, they are old enough to be open to any body. The curtain has another ring near its edge, which just comes over a pin P in the uppermost tumbler when it is down, and prevents it from rising, except when the

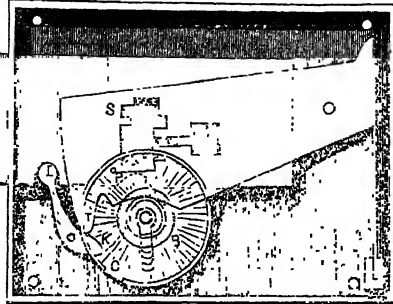


Fig. 21.

curtain is turned far enough round to bring the gap at C in the ring over this pin, which happens just when the key begins to lift the tumblers. But the real peculiarity of the lock is this: In locking, just before the key leaves the tumblers, it delivers the stump, not into the place where it is now shown lying, but into the notch S; but before it leaves the lock the key encounters the end of a lever KL, which pushes the bolt back a little, and so lets the tumblers drop a little lower, with the stump in the position shown here. When the key opens the lock again, it passes by the end K of the lever, and first lifts the tumblers a little by their corners, near K, at the same time that the gap C in the curtain-ring comes over the pin P; then it encounters a piece that comes down from the bolt near T, and shoots the bolt forward a little, without which the tumblers cannot be fully raised (as will be seen from the shape of the false notches), and then the key operates as usual. Nevertheless, this certainly cannot be placed in the class of absolutely secure locks; for if a pick can be got to work over the neck-ward and curtain-ring or barrel, which is well known to be possible, it does not appear to us that there would be more difficulty in picking this lock than any other with false notches; for it makes no difference that the bolt has first to move forwards a little and then backwards, and the curtain could easily be got into the position to free the tumbler which it holds. However, these locks are sold a good deal cheaper than other locks with much less security used to be, and, if not absolutely secure, they are sufficiently so for all common purposes.

This reduction in the price of good locks, besides the improvement in the quality, is plainly the consequence of the exposure of the defects of all the existing English locks in the Great Exhibition, which some persons endeavoured to smother as dangerous, and others to explain away as proving nothing against the character of our locks. Not only have we got Mr Hobbs's own improvements in construction, and reduction in price, by the introduction of machinery for lock-making to an extent hitherto unknown, but there is now in the market a variety of what may be called very good locks, even though most of them could be picked by a very first-rate hand with plenty of time, and at lower prices than were charged for the only two locks which had any reputation until the last few years, viz., the Bramah and the Chubb locks. And the mere variety of locks is in itself a source of security, because a thief no longer knows by the look of a key-hole what kind of machinery he has got to deal with inside.

Restell's Lock.—There is only one other modification of

the old many-tumblered lock that we need notice, and that is Mr Restell's. The only peculiarity in it (for the revolving curtain and barrel are much too old to be so designated) is the addition of a disc at the bottom of the barrel, in the same plane as the bolt. The bolt can only pass when the disc is in one position, i.e., when a piece which is cut out of it is just under a kind of tooth in the bolt; and at all other times the disc, lying partly within the bolt, holds it fast, and prevents any pressure being put on the tumblers. But this, again, proceeds on the erroneous but common assumption that the instrument for feeling and lifting the tumblers a little at a time cannot be used when the key-hole is closed, except at the centre, by the curtain and barrel; whereas it is, in fact, worked through a kind of hollow key, which presses on the bolt while the pick works the tumblers, and it can be done in locks with far greater impediments to it than this, although we say of this, as of Mr Parnell's, that it is an improvement upon any of the locks made before 1851.

Restell's
Lock.

Locks without Tumbler-springs.—We now come to a class of locks in which the tumblers or slides are no longer moved one way by springs and the other way by the key; for we shall postpone the description of the complicated American changeable key locks until we have taken the reader through the easier matters. In the locks we are now going to describe the tumblers, or slides, or discs, which stop the bolt, are kept in their places by friction only, and will stand anywhere, having thin plates lying between them, and being pushed or turned one way in locking and the other way in unlocking.

In the Exhibition of 1851 there was a disc or wheel lock exhibited by an American named Jennings, who used to expound it with great eloquence as cheaper and better than any other lock in the world. It had also a changeable key, i.e., the key was a mere stalk or shank, fitted with small rings, each with a bit projecting from it, and they could be transposed, together with the corresponding parts in the lock. This of course can be done, and had been done before, with the key of any tumbler-lock, if you take the lock off and change the tumblers, provided the bits are made to fit into the key, instead of being part of it as usual; but we shall have to say more of this hereafter. We have been unable to learn what has become of Mr Jennings or his lock, except that Mr Hobbs showed us a very simple way of picking it, by poking a piece of watch-spring, with a hook at the end, between the discs, and feeling for the notch in the circumference, and then bringing it round to the right place for the lock to open.

Jennings's
lock.

Andrews's Lock.—Another American lock on the disc principle, by Dr Andrews, was exhibited at the Society of Arts in 1853, with some others that we shall notice, when that sagacious body awarded its premium to a lock made by a Mr Saxby, which Mr Hobbs forthwith picked in three minutes with a bit of wire, and then reminded them that he had himself exhibited a drawing of an old lock of the same

construction at a lecture in that very place only about a year before. Dr Andrews's is called the snail-wheel lock, because all the discs except the upper one have snail-shaped holes in them, as in the last of these figures (fig. 22). The upper disc has only a square hole (except that for the drill-pin on which they all turn), which is the key-hole, and that disc always

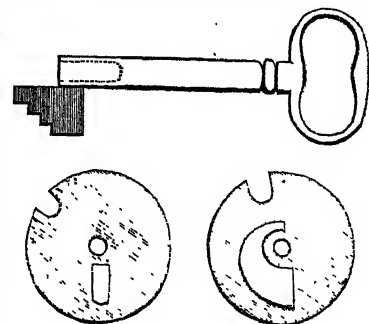


Fig. 22.

Andrews's
Lock.

travels with the key; the others only begin to move in one direction as soon as the key encounters the spiral edge of the hole, and of course they are carried to different distances, according as the corresponding bit of the key is shorter or longer. They are separated by loose, thin plates, which cannot turn with them, and act as friction plates. Each disc has a notch in it, and it is only when all these notches are brought together under the end of a spring lever, called a "toggle," that it can drop into them. As soon as you feel or hear that take place, you have to turn the key back again, and the discs still keep together, because the toggle fills up all the notches, until it is worked out, as they revolve, and it carries the bolt with it; and then the discs no longer move together, but some lag behind until the key reaches the square end of all the snail-holes, and so brings them all into the original position, with the notches standing in different places, and then the key can come out. We do not know by what method this lock can be picked, as it can hardly be possible to distinguish between the pressure of the toggle on the edges of the discs and the absence of pressure when it is over a notch, on account of the great amount of constant friction; and the smallness and eccentricity of the key-hole would make the watch-spring method extremely difficult, if not impracticable. But besides the key-hole being thick and clumsy, on account of the great friction which it has to overcome, the lock is uncomfortable to work, and it is therefore not likely to come into use against the easier locks with smaller keys, and equal, or at any rate sufficient security, which are now made.

Tucker's
locks.

Tucker's Locks.—There have been several locks on the disc principle invented in succession by Mr Tucker, of Fleet Street, the first two of which had revolving discs; and in the last and more simple one, patented in 1855, though the discs no longer revolve, they slide between fixed plates without springs, and do not turn on a pin like common tumblers, and will stand indifferently anywhere. It will be sufficient to describe the last of these inventions, as Mr Tucker himself states it to possess all the elements of security of the former ones, with the advantages of being much cheaper, because more simple in construction. In fig. 23, T T is one of the sliding tumblers, which are separated by thin fixed plates, and slide upon the guide-pins at T T, and have also friction-springs X, pressing on them to keep them steady. S is the bolt stump, which can only enter I, the gating of the tumblers, when they are pushed the proper distance towards the left, which the key will do as soon as it turns towards the left, in the usual way of unlocking. But something else still prevents the bolt from falling, and that is the flat curtain C, which turns with the key, and has also a barrel B, as in several of the other locks we have described. This curtain also prevents the stump from being pressed against the tumblers, being just big enough to keep it from touching them until it has turned nearly three-quarters round, when the pin S, which stands up on the stump, can enter the opening D in the curtain (shown by a dotted line in the drawing, to prevent confusion). But by the time the curtain has got so far round, any instru-

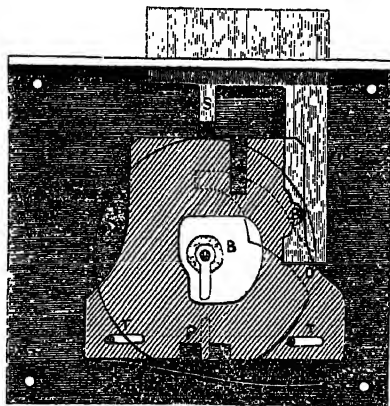


Fig. 23.

ment in the key-hole would be prevented by the barrel from reaching the tumblers so as to push them back and feel the pressure of the stump; at least so the inventor asserts, and we do not venture to contradict him; but it must be remembered that no revolving curtain and barrel have yet been able to prevent the instruments of the American lock-pickers from reaching and moving the tumblers, at the same time that the barrel is being pressed the other way in order to keep up pressure on the bolt. The only way (so far as we can see) to prevent this is by a contrivance, such as Mr Denison's lock (described below) was first made with, of a kind of door between the tumblers and the key-hole, which opens for the key just before it reaches them, and closes again after it has moved the tumblers, and before any action at all upon the bolt begins. It will be seen hereafter that in that lock this shutting off the tumblers from the key-hole was afterwards carried still further, as the key there does not operate on the bolt at all, but must be thrown out of the key-hole, and the hole completely closed, before the bolt can be drawn back; but the first arrangement may very well be used in cases where the key is wanted to operate on the bolt.

We have not yet explained how the bolt in this lock is drawn back when the curtain has got into the proper position for it. It is not done by the last bit in the key acting directly on the bolt, as usual, but by a bit P fixed on the curtain itself, which acts upon the notch B in the bolt, as the key usually does. And this same bit P performs another function in locking, viz., shooting all the tumblers into the position here shown by striking against a pin which is set in the bottom one, and comes up to the curtain, and so carries all the others with it by means of the square notch which is cut in all of them, except the one which has the pin in it. It must be observed that the curtain does not lie close upon the tumblers, but there is the thickness of the bolt, or of the bit P, between them. A spring locks into the curtain and prevents it from being turned, except when this spring is pressed down by putting a key into the key-hole. One object of making the curtain, and not the key, to lock and unlock the bolt is, that you guard against the risk of what is called short-locking; i.e., sending the bolt in any common tumbler-lock not quite far enough for the tumblers to drop. There are means by which a person intending afterwards to pick a lock might cause it to lock short, if he had previous access to it, or possession of the key, at least as locks are generally made, and then, of course, he has only to pull the bolt back, the tumblers having never fallen. Moreover this arrangement in Tucker's lock allows it to be locked by any key that will turn in the key-hole, though it cannot be unlocked by any but the true key, or one which will move all the tumblers to the right place for the stump to enter them. Mr Tucker has also applied the curtain in his padlocks in such a way that the shackle has a tail reaching inwards and resting against the curtain at all times, except when it is in the proper position for opening; i.e., when this tail is opposite to a segment cut out of the curtain corresponding to the opening D in the lock just now described, but much larger. The object of this is to obtain greater strength than usual to resist all attempts to force the shackle open. The cheapness of these locks is due to the circumstance that all the principal parts can be stamped out of sheet brass, the curtain alone being cast with the barrel and bit P on it, and its face turned, which is a cheaper operation than filing. In this respect it approaches to Mr Hobbs's style of lock-making, only he has carried the stamping and machine-finishing system much farther; indeed, it is hardly exaggerating to say that he has abolished the use of the file, and left nothing to hand labour except the mere fitting of the pieces together, and putting the tumblers in the right position to have the gating cut according to the key.

Tucker's
Locks.

Nettle-
fold's Bolt.

Nettlefold's Bolt.—We have just now alluded to padlocks, and we shall do so no farther, because they are generally of exactly the same internal construction as other locks of the same maker. And, for the same reason, it is unnecessary to describe the various modifications of the fastening part of locks to adapt them to peculiar uses or positions; but there is one which does seem to be worth a short notice, viz., an invention of Mr Nettlefold, patented in 1839, for making the bolt hook into the striking plate, against which it locks. This drawing of it (fig. 24) will explain the nature of the contrivance at once. We have inserted no tumblers, because it may be used with one kind of lock as well as another. It is convenient for writing-desks, sliding cupboards, and even for drawers, which can often be prized open by merely putting in a screw-driver above the lock, and forcing

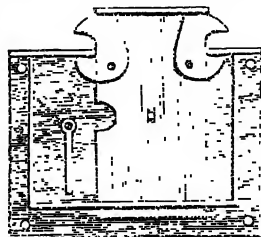


Fig. 24.

up the piece over it just enough to let the bolt pass, which is generally short. There are other ways of doing the same thing, such as making the bolt itself hooked, and giving it two motions, first vertical, to shoot it out, and then horizontal, to hook it into the striking plate; and some Bramah locks are made with a kind of annular bolt, which forms a rim to the cylinder, with a segment cut off in one place to let the striking plate come down, which is then taken hold of by the other part of the ring as it revolves. Bramah locks of portfolios, and articles of that kind, are usually made in this way, which is very cheap and simple.

Master-
keys.

Master-Keys.—It is often convenient to have a set of locks so arranged that the key of one will open none of the others, and yet the owner of the whole may have one master-key that will open them all. In the old locks with fixed wards this was done by making the wards of a slightly different form, and yet such that one skeleton will pass them all, just as the skeleton-key in fig. 4 will serve for the warded key of fig. 3, and a multitude of others. In locks with sliders or tumblers, the way is to make one tumbler in each lock with a wider gating, so as not to require lifting so high as it does in the other locks of the set; then the key of that lock will raise that tumbler in that lock high enough to clear the stump, and yet the master-key, which has a longer bit in that place, will not raise it too high, because the gating is wide enough for both; but the special key of that lock will not open any other of the set which has not the same tumbler widened in the gating. Mr Chubb, some years ago, made a set of locks for the Westminster Bridewell, with keys for the different grades of officers. The owner of the head key can stop out any of the under keys; and if any attempt is made to pick any lock, and the detector is thrown, it cannot be released by any of the subordinate keys, though they can open the lock in its normal state, and consequently the governor must be acquainted with it. There are a variety of other forms of many-tumbled locks, some with the tumblers acting upwards at one end and downwards at the other (Parson's lock); and others with some of the tumblers pulled down by bits cut within the web of the key, besides the usual ones to be pushed up by the key (Somerford's); and some with a combination of the Bramah plan in the pipe of the key, with the Chubb plan in the bits, and so on; but none of them involve any novelty in principle, and they are all capable of being dealt with in the same way: and therefore we shall at once pass on to another class of locks, viz., those which shut of themselves, and are called—

Spring or Latch Locks.—These locks we chiefly notice because they require a particular provision to make them

in the smallest degree secure, and are, nevertheless, often left without it, by way of saving a shilling or two in their price, and multitudes of street-door robberies are committed in consequence. The former of these two names is generally used for a lock which shuts of itself on a box or drawer, or articles of that kind; and the latter for street or room-door locks, which shut of themselves, and open with a handle on the inside, but only with a key on the outside. In the simplest and cheapest form of these locks there is no pretence of any security except a few fixed wards, which the key has to pass; and, as before explained, that is no security at all against anybody with the smallest dexterity, and with a serious intention of opening the lock. Next to them, or rather below them, pretending to be what they are not, come the locks which lock a certain distance themselves by means of a spring, but can be locked farther by the key, and having tumblers, but no fixed wards (which a good tumbler-lock does not require). But though this kind of lock cannot be opened when it is thus double locked, except by the key, or some efficient mode of picking, yet when they are only self-locked (which is the most they are ever locked in 99 cases out of 100), the tumblers are of no more use than if they did not exist, and the lock can be opened by any bit of bent wire that will go into the key-hole. It should be remarked however, that the Bramah lock is just as secure as usual when used for a spring or latch lock, because the key cannot turn at all without pushing in the sliders properly. But in this, as in all latch-locks, it is very unsafe to have a handle which pulls back, as it can easily be reached by a wire put through a hole in the door; the handle should always be made to turn, like a common room-door handle.

There are two ways in which spring-locks with tumblers may be made as safe as the same lock with an ordinary bolt. One is to make a click or catch fall into the bolt when it is drawn back, and not to make the tumblers to fall when the bolt is drawn back: in the shutting of the door this catch is pushed back by some knob projecting for the purpose, and then the tumblers fall and hold it fast. But this will not do for a latch-lock which is intended to open by a handle on one side of the door. For that purpose the proper plan is that which is now adopted in all good latch-locks, not to let the key act directly on the bolt, which has no stump, but on a false bolt which lies on the top of the real one, and has the stump fixed in it. When the real bolt is shut by the spring it carries the false one with it, and that is then locked by the tumblers. But the real bolt can be pushed back by the door shutting, or pulled back by the handle, without moving the false bolt, though it cannot be reached through the key-hole. In buying a lock, the test of this is to see whether the stump moves as you push or pull the bolt back. If it does the lock is good for nothing, unless it is on the peculiar construction to be described immediately.

Chubb's Latch-Lock.—In order to prevent the bolt from being pushed back by a piece of wire poked in between the door and the staple into which it locks, Mr Chubb has made the following ingenious modification of the common latch-lock. In fig. 25 the bolt is drawn back by turning a handle H as usual, but the handle also raises all the tumblers like a key. But the back tumbler T is not set on a fixed pin as usual, but on a pin in the bolt, and so travels with it; and when it is drawn back far enough, i.e., about half way, the spring S falls in front of that tumbler at T, and so, when you leave hold of the handle again the bolt only goes about half way out, as far as B, the point to which its face is bevelled. But when you push the door to, the sloped corner of the bolt at R raises the spring S, and the tumbler T not being then held up by the handle, it falls and clears the spring, and so the bolt shoots the whole way out, and the other tumblers fall upon its stump, and it can only be

Latch-
Locks

Chubb's latch-lock. opened either by the key K or the handle H raising all the tumblers to the proper height.

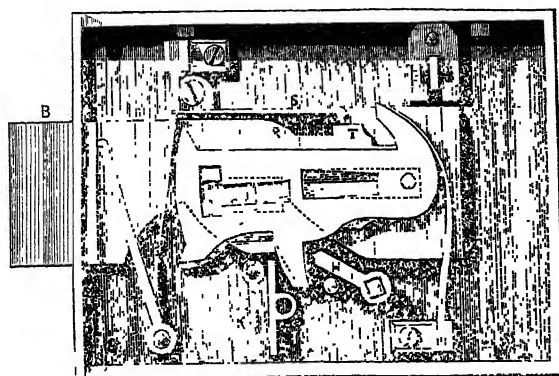


Fig. 25.

To prevent confusion, we may observe that there is another lock called Chubb's *latch*, in which the bolt consists of a number of tumblers prolonged. But this is a very inferior article to the *latch-lock* just now described, or even to a latch-lock made in the second of the methods above mentioned. We understand the latch-lock is used extensively in prisons (of course without the handle), where it is not only desirable to avoid the necessity of having to lock the cell doors by a key, but also to provide against the ingenuity of the inmates in pushing back the bolt of a spring-lock. It has been suggested however, that this provision may be defeated by a prisoner, or any other thief not yet in prison, putting something into the bolt-hole which will prevent the bolt from shooting full out, and then the tumblers will not fall, and the bolt can be pushed back easily. A safer lock for this purpose is one which we shall describe presently, and which locks by merely turning the handle, but cannot be opened without the key.

Spring-curtain.

We may observe also with reference to these latch-locks for house doors, that they very soon get spoiled, at least so far as to impede their action, and render them unsafe, by the dirty atmosphere of a large town. This might easily be prevented by using a spring curtain like that which we shall describe in Mr Denison's smaller lock. If purchasers of locks would insist on having such an addition made, it could be done without increasing the cost by more than a shilling, and it would save its price many times over, by the length of time the lock would go without cleaning, and last without being spoilt. But unless purchasers insist upon having it, it is not likely that the lockmakers will volunteer such an improvement. The curtain should slide easily on the drill-pin and on another pin, just below the lower end of the key-hole, and be pressed up by a long thin spring acting upon it near the drill-pin. We suggested this some time ago to a celebrated London lockmaker, and he undertook to get it done. After some months he produced a lock, with a spring curtain certainly, but (with that peculiar ingenuity for baffling any new invention which English mechanics generally display) the curtain made to slide on two pins set at some distance on each side of the drill-pin, instead of a single pin below it; and the consequence of course was, that there being nothing like the web of the key to push the curtain down straight, it went rather obliquely, and generally jammed itself fast upon the pins, and then (as usual in such cases) was pronounced impracticable, and thrown aside; and all this with one of Mr Denison's small locks as a model to copy, in which the curtain slides up and down quite easily. It has since been done properly by Mr Hobbs; and there is plenty of room to add it to any existing lock which has a false bolt lying above the true bolt for the key to act on, as every good

latch-lock must have; for otherwise the tumblers are of no value whatever, as explained above. Safe Locks

Safe Locks with small Keys.—In all the locks we have yet mentioned, the bolt is acted on by the key, even though the key may not touch it; and the key must therefore be strong enough to move the bolt besides lifting the tumblers, or whatever is substituted for them; and this makes the key for a large lock too large and heavy to be conveniently carried in the pocket, and a bunch of such keys impossible. To get over this difficulty, most of the makers of iron safes have adopted the plan (we do not know by whom invented) of shooting a large bolt, or a number of bolts, by means of a handle, and then a small lock with a small key locks into one of them, and thus fastens them all. The security then depends upon the impregnability of the small lock against fraudulent picking or forcible evisceration. And it may be mentioned here that there are certain thieves' instruments, by which a force sufficient to tear open the inside of a lock can be inserted through a key-hole of the common size. This, however, is now defeated by cutting out a piece of the back plate, and then screwing it on again, with only a few small screws; and so that alone gives way under any bursting pressure, whether from the instrument called the jack-in-the-box, or from gunpowder, which is another of the thieves' methods for cutting the knot which they cannot untie. If the small lock, therefore, cannot be picked, or forced, this mode of locking the bolts of a large door is quite safe, and you have the advantage of a very powerful lock with nothing to carry in your pocket larger than a small desk key.

Denison's Lock.—A lock was invented however, in 1852, but not patented, which combines the advantages of large and strong works, with a key-hole so narrow, that no instrument strong enough to injure the lock could be got in, nor a reflector to observe the bellies of the tumblers; and the bolt is not only shot by turning the handle, but locked besides, without using any key at all. But it cannot be opened without the key; consequently, there is no occasion to entrust the keys to clerks, or other persons who may be left to close the boxes or doors, provided the owner, or some one confidential person, is there in the morning to open them. This lock enjoys the distinction of being the only one of English invention which is pronounced secure,—at least against any known method of picking,—by Messrs Hobbs and Tomlinson, in the treatise before referred to. It was invented by Mr E. B. Denison, Q.C., whose name has been frequently mentioned already in the article on Clocks; and the following is its construction:—

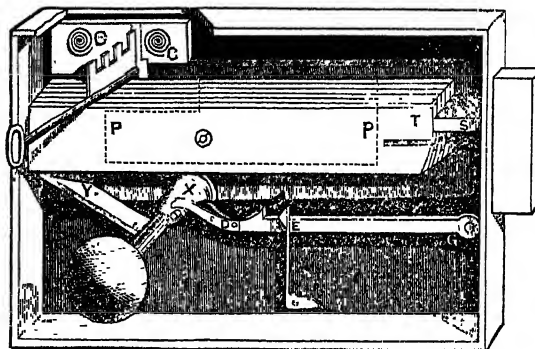


Fig. 26.

In fig. 26 are shown the tumblers T, turning on a pin at or near the middle of their length, so as to be nearly balanced, though in small locks this is unnecessary. Between every two adjacent tumblers, and between the bolt and the tumbler next to it, there is a thin steel plate, which occupies the position shown by the dotted lines PP. These plates have one edge lying against the upper side of the lock, so that they cannot turn at all on the tumbler-pin, which goes

Denison's
Lock.

through them quite loosely. One or two of the plates should be bent a little to make them act as friction springs on the tumblers when the cap of the lock is on, so that they will stand indifferently in any position. In the figure they are drawn all pressed down, so as to prevent the stump S from entering the gating, and this has been done by the long tail Y of the handle, which, it is easy to see, will raise the left end of the tumblers, and depress the right, after the fan-tailed piece X of the handle has shut the bolt. After the tumblers have been raised to the proper height by turning the key half round (where it may be stopped by the plates P, P), the stump can enter the gatings, and the bolt can be drawn back by the handle, the tail Y then doing nothing. So far as we have gone yet, the lock would possess no greater security than any other many-tumblers lock; but there is a steel curtain CC, which does not revolve as usual, but slides on two pins set in the back of the lock, and is pressed up against the front plate by two spiral springs, so as to close the key-hole completely, except when it is pressed in. From the back of the curtain there goes a kind

of square plug (shown in section at fig. 27), which can be pushed through a hole in the back plate, and has a notch in it just in the plane of the bolt, and the bolt itself has a corner there; so that when the curtain is up, the bolt can be drawn back through the notch in the curtain plug; but when the plug is pushed in ever so little, the bolt cannot be drawn back, because its corner cannot pass the curtain

plug; and in this position the stump cannot be made to touch the tumblers, except one of them, which is made a little longer than the rest (as shown at T in fig. 26), in order to keep the bolt steady. It is evident then, that as soon as you push in the curtain to admit any instrument whatever, the bolt is held fast, and it becomes impossible to put any pressure of the stump upon the tumblers; in other words, the tentative mode of picking is impossible. In small locks, the curtain has no plug, but merely works against the edge of a second stump of the bolt, which can only pass when the curtain is up, and it slides on the drill-pin and another pin below it.

The security of the lock is further increased by the addition of what may be called a detector DEG, as it does detect if the bolt has not been shot far enough by the person who locked it; and what is of more consequence, prevents it from being opened in that state. It turns on a hinge or pin at G, and is held up or down by a jumper-spring at E, as in Chubb's first detector. In fig. 26 it is shown as held down, or out of the way of the bolt; but as the handle turns back again and draws back the bolt, the pin below X raises the detector a little, and then the spring is ready to throw its tooth into the notch in the bolt as soon as it is shot only about half way; and in that state the bolt cannot be drawn back without turning the handle far enough for the fan-tail X to send the detector down again below the corner of the spring, and by doing that you will also have locked all the tumblers, and so made the lock fast until the key comes to open it. And it is to be observed, that the curtain cannot be pushed in until the bolt is fully shot, so that no exploration of the lock can take place while it is open, or even partially open. It may be arranged, if required, that the curtain could not be pushed in, not only until the bolt is shot, but until the tumblers are locked also, by adding a spring catch under the curtain, to be freed by one of the tumblers when it is fully locked.

The following, therefore, are the advantages of this lock:—

1. A very large lock, with all its parts strong, only requires a very small key, not weighing above a quarter of an ounce.
2. No key is required to lock it, and you cannot leave the key in the lock (a fruitful source of mischief), and yet it is free from the inconvenience of spring-locks, which sometimes

shut themselves when not intended; and moreover, a large spring-lock requires a large and strong key to open it. 3. It cannot get out of order from the usual causes of the tumblers sticking together, or tumbler-springs breaking, because there are none, and the tumblers do not touch each other, but the friction-plates between them. 4. The key-hole being always quite closed by the curtain, except while the key is in, the lock is protected from dirt and from the effects of a damp or smoky atmosphere, which injures other locks. 5. The smallness of the key-hole prevents the insertion of any instrument strong enough to force the lock, and also prevents inspection. 6. It is pronounced by the highest authority to be secure against any known mode of picking. 7. It requires no delicacy of construction or high finish in any of the parts; and the moving parts are few; in fact, the whole of them together are fewer than the number of springs alone in the great American lock which we shall next describe. 8. It is free from the incumbrance of a patent, the inventor being one of those who agree with the opinion of the Jury on Philosophical Instruments in the Great Exhibition, and with many of the first engineers and most scientific men, that "patents are a great obstruction to the progress of science," and waste, on the whole, more money than they gain for real inventors.

Notwithstanding these advantages, we cannot learn that any of the lockmakers have taken up the manufacture of this lock, all of them having a settled course of manufacture of their own articles, which they find they can sell sufficiently; and unless some large order should be given for this lock (as for a set of prison doors, for which it seems peculiarly adapted, with a master-key arrangement) it seems not likely to be adopted until some startling event makes the public open their eyes to the insecurity of the established forms of English locks which they have long believed in. We now proceed to describe what has been considered the great triumph of transatlantic skill, viz.:—

Day and Newell's Parautoptic Lock.—This formidable Day and Newell's name has nothing to do with the chief peculiarity of this lock, viz., the power of changing the key and the state of the lock without taking it off the door, which might have been indicated by an equally imposing title—*parallactic*. Parautoptic only means that it cannot be examined through the key-hole, which is not peculiar to this lock. In order to understand this complicated machine it will be better to consider the provisions for security against picking, and those relating to the changeability of the key, independently of each other, as they have nothing to do with each other, and either might be used without the other. The object of the changeable key is merely to provide against the risk of its falling into the hands of somebody who may have taken an impression, and made a false key from it:

Denison's
Lock.

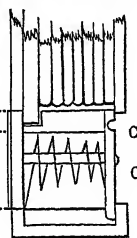


Fig. 27.

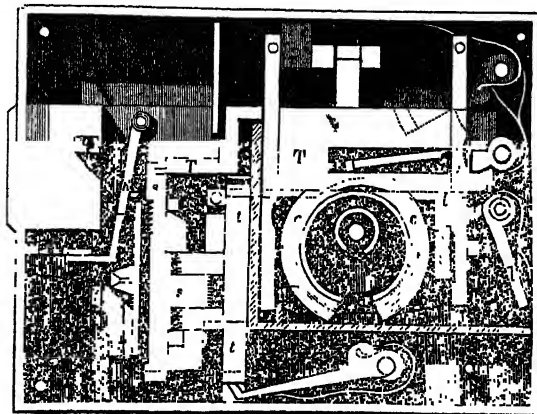


Fig. 28.

a risk which is perhaps rather more likely to be increased than diminished by the great size of this key, and the dis-

Day and
Newell's
Lock.

position of people not to carry such a large instrument in their pockets more than they can help, and the probability of their not taking the trouble to unscrew the bits and change the form of the key every time they use it. Assuming then, for the present, the key not to be made with moveable bits, the security of the lock depends on the following points:—The stump *ss*, which for the present must be assumed to be attached to the bolt, does not act against the tumblers *TT*, which are raised by the key, and may be called the primary tumblers, but on a set of secondary ones *tt*, which are made to follow the primaries whenever they are raised by a set of springs under them, which are not strong enough to resist the primary tumbler-springs, but are strong enough to lift the secondaries when the pressure of the others is taken off. But even this does not fully represent the independence of the secondary tumblers, for each secondary tumbler *tt* really consists of two pieces, of which one is pushed up by the spring and lifts the other with it, which has the gating or jaws to receive the stump, but can rise without the carrying piece being lifted. The consequence is, that supposing pressure to be applied to the bolt so as to hold fast one (or more) of the secondary tumblers, it only holds the gating piece, and the corresponding primary tumbler remains as free to move up and down as if there were no pressure, and therefore the pressure cannot be felt. Moreover, there is a fixed wall in the lock between the key-hole and the secondary tumblers, so that it is impossible to reach them from the key-hole. All the tumblers move between parallel guides, instead of turning on pins as usual; and the primary ones are also separated by thin loose strips of iron, which prevent them from sticking together. The secondaries, however, would be the most likely to stick, as their springs are weaker; and as their action depends entirely on the springs, which are comparatively weak, we cannot help thinking there is some risk of their getting stuck together by rust forming between them, or by a drop of thickened oil, as sometimes happens in Chubb's, or any other spring tumbler-lock.

The primary tumblers are also prevented from being inspected through the key-hole by a curtain *cc*, which is not the ordinary flat curtain with a small barrel close to the key-pipe, but a large ring or barrel turning in a circular groove in both the lock-plates. Moreover, this curtain is not concentric with the key-hole; and therefore, although the bits of the key do not project beyond the curtain when it is put into the key-hole, yet by the time it has got nearly half round they project considerably, and raise the tumblers as if there were no curtain at all in the way. On the front edge of the curtain there is a broadish flange with a segment cut off at the top, and on that segment there lies another tumbler (covering the primary tumblers, and supposed to

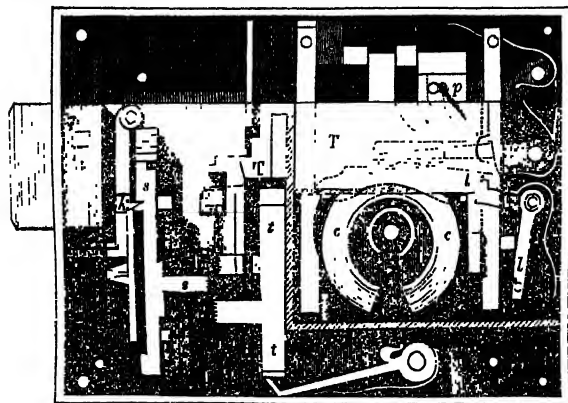


Fig. 20.

be taken off in fig. 28, but shown in fig. 29); and any raising of this tumbler by turning the curtain, brings over the straight part of the key-hole (through which alone any inspection could be made) a revolving plate (fig. 30¹), which lies outside the front plate of the lock, by means of a pin *p*, which comes through the front plate, and works in a hole in the revolving plate. This revolving plate is called the detector plate, but with no good reason, for, like many other so-called detectors, it detects nothing, though it does present additional obstacles to opening the lock with anything except the right key. For, when the lock is locked, it has hold of a pin *q* in the bolt, which can only be freed by the plate revolving, and so closing all the key-hole, except the hole in the middle, which is occupied by the key. There is also a kind of spring-lever *ll*, which locks upwards into the bolt, and is also only freed by the tail *m* of the revolving plate as it moves to the left under the action of the key.

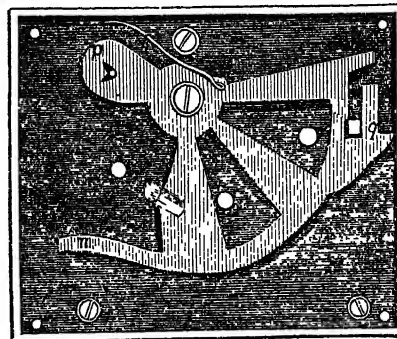


Fig. 30.

In spite of all these accumulated securities, one of these locks was lately picked in America by a totally unexpected method. There is no great difficulty in getting an instrument into the lock which will deposit a little printing-ink, or other black grease, on the bellies of the tumblers just over the key-hole. This was done a short time before the owner was going to lock the lock; and the effect of his doing so was to spread the ink along each of the tumblers just as far as the key happens to touch it. If you can get now another instrument, or succession of instruments, into the lock, which will take off the impressions made on the tumblers, or measure the length of them, you can make a key from it; and the great size of the key-hole enables this to be done by putting in a wooden key of this shape; the rounded surface allowing the black on the tumblers to mark its own length thereon. Mr Hobbs however has defeated this contrivance, by adding a wiper to the revolving curtain, which always passes over all the tumblers after the key, and so wipes the ink along them all equally, and prevents the length of sweep of the key-bits from being distinguished. We may observe here, that the opening of a six-tumbled Newell's lock in this country, a few years ago, which the English lock-makers made a great deal of, proved nothing at all, as it was done by merely working through the permutations of the key, which are only 720 for 6 tumblers; and the right one was, by good luck, hit upon long before they were all gone through. An expensive lock of this kind ought not to have less than 8 tumblers, which would give 40,320 changes, and take a man four months to work through, at the rate of one every two minutes for twelve hours a-day. Besides that, it is possible still further to increase the number of changes by having some spare bits to the key beyond the number of tumblers, so that the number of changes may be increased enormously, as nobody finding (say) 12 bits loose could tell which eight of them had been used to form the key to lock the lock.

In order to understand the principle of this changeable key machinery, suppose that you could shift the position of the stump in an ordinary tumbler-lock, then all the bits of

Day and
Newell's
Lock.



Fig. 31.

¹ In this figure, which is copied from Mr Hobbs's *Rudimentary Treatise on Locks*, the detector plate is drawn the reverse way of the two figures of the lock; for what reason we are not aware.

Day and
Newell's
Lock.

the key would require making shorter or longer in order to raise the tumblers to the proper height. Suppose next that each tumbler had a stump of its own screwed to the bolt, but capable of being unscrewed and shifted at pleasure, then every bit of the key would require altering whenever you alter the position of the corresponding stump. And again, suppose these separate stumps to be so attached to the bolt, by a ratchet and click, or some similar contrivance, that when the bolt is back and the stumps lying in the jaws of the tumblers, the tumblers will carry the stumps with them to whatever height they may be raised by a key, and leave them sticking to the bolt at that height when the bolt is shot, and the stumps pass out of the jaws of the tumblers,—then it is clear that the lock can only be opened by the same key which raised the tumblers and stumps to that particular height; and yet, as soon as it is opened, the stumps again come under the dominion of the tumblers, and any other key will do to lock the lock again just as well as the one which was used before. In other words, such a lock is perfectly neutral and indifferent as to the key which may be used to lock it, but it cannot be unlocked by any key except the one which locked it last; and, therefore, by changing the key, or the arrangement of a given set of bits fixed to one stem, you change the lock also.

We may observe, that a key with transposable bits is by no means new; but then it always before required the lock to be taken off, or the tumblers transposed by some other operation, to suit the alteration of the key. Fig. 32 shows the construction of any changeable key, the bits being put in in any order, and fastened by a screw going through them all.



Fig. 32.

Now, to apply this to Newell's lock. In fig. 28 it is shown unlocked, and the moveable stumps *ss* are then lying within the jaws of the secondary tumblers *tt*; and besides that, they are now taken hold of near the top by the long pieces projecting from the primary tumblers *TT*. Consequently, when the primaries are raised by the key for locking, the sliding stumps *ss* are lifted with them; and as they slide up and down between guides fixed to the bolt, they are carried forwards, and out of connexion with the primary tumblers when the bolt is shot; but just before the connexion ceases, a click *k* falls into the back of the stumps (which are notched for the purpose), and holds them at the same height until they return. There are as many notches in the stumps as there are different lengths in the key-bits; and, as before stated, there may be any number of bits capable of fitting on to the same key, whether of the same or different lengths, so as to increase the variations in the lock without increasing the number of the tumblers.

These locks do not appear to have been as yet much adopted in England: whether from the cost, the ponderousness of the key, and the trouble involved in taking it to pieces frequently (for without that, the changeability is no security whatever), or merely from the national antipathy to novelties, and the national confidence in our own security, we do not pretend to say. It is certain that, in America, both the thieves are more dexterous, and the owners of property spend much more upon locks and safes than we do. A New York watchmaker told us lately that he locks up all his valuable goods every night in a cast and wrought iron safe two inches thick, with a lock that cost £50. There are however some of them used in the Bank of England, and a few other banks.

The French Changeable-key Lock, though very inferior to the American ones in security, has this advantage, that nobody can lock or change it for mischievous or fraudulent purposes without possession of the key that last locked it. The primary tumblers which are raised by the key do not

contain the gatings for the stump, but work a second set of tumblers which do, by means of teeth, like two toothed wheels working together. In order to change the lock, you overlock it backwards a little with the key that will open it (*i.e.*, which locked it last), and, by turning a small handle, you throw the two sets of tumblers out of gear with each other. Then change the bits of the key as you please, and put it into the lock again and turn it, as before, half way round, and bring the tumblers together again by the handle. They will join by a different set of teeth from before, and the altered key alone will open the lock. This plan may be adapted to any kind of tumbler-lock; and if it is one of a secure construction, it would be just as good as the more complicated American lock. Mr Chubb has lately made some of these locks; but in this instance also, the necessary size and weight of the key seems to be an impediment to their use; and probably any one who was inclined to spend a largish sum on a changeable lock, would buy the American one, which is undoubtedly very superior to the French in security both against picking and violence.

In order to get over this disadvantage of a large key, Mr Hobbs invented another lock, which is equally changeable, and still more parautoptic, or secure from inspection, than Newell's. The key that you have to carry is, in fact, nothing but the web or bits of a key, which may be either fixed or changeable, according to the nature of the lock. The key-hole has no centre of motion within it; but when this web of key is pushed into a hole in the lock, you turn a handle in another place, and that carries the key round quite invisibly, closing the hole completely; and as it turns, it opens the lock in the usual way, and returns. There is no possibility of feeling or examining its action, as no handle can go with it into the lock. The only objection to it is, that it is troublesome to put such a key in, and still more so to get it out again; and consequently, it has not taken with the public, nor do we believe that any lock will, which does not admit of a moderate-sized key of the usual form, and to be used with no more trouble than usual. We cannot help thinking that some spring action might be contrived, which would enable this very neat and small key to be pushed into the lock and shot out again, with no more trouble than is involved in turning a key and then a handle, as in the now common arrangement for large safe locks.

In fact, after we had written this, Mr Hobbs sent us a Yale's lock. new American lock, invented by Mr Linus Yale of Philadelphia, in which this very thing is done; the bits of the key being taken off the shank or handle, and carried away into the inside of the lock, where they perform their work, and rejoin the key shank before the revolution is completed. But the key itself is so large and thick, that it is far from realizing the advantages just now suggested in Mr Hobbs' travelling key-bits. The description sent with it is unfortunately quite unintelligible without an inspection of the lock itself, and the lock is so complicated, that we despair of being able to convey any idea of more than the general principles of its construction. It is a changeable lock, like Newell's, and with this great point of superiority over that lock, that it is entirely independent of the action of tumbler-springs; the moveable stumps, and the sliders or tumblers which act upon them, all lying between friction plates, as in Denison's and Tucker's locks, and standing indifferently anywhere. The only spring is a long spiral spring in the shank of the key (fig. 33), which drives a pin through the bits (which are all screwed together just in whatever order you please), and that pin yields to another pin in the lock, which meets it as you push the key in; so that the bits then become attached to this lock pin, which itself moves on a sliding stud, which carries off the bits into the acting part of the lock against the ends of

French
Changeable
Locks.



Fig. 33.

LOCK.

Yale's
Lock.

the sliding tumblers. This part of the lock, viz., the box containing the sliders, is shown in fig. 34. Any of the primary sliders T, when pushed by the key, carries along

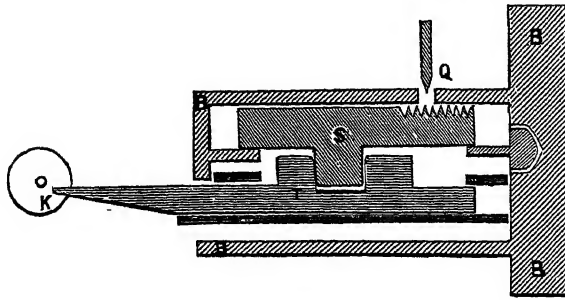


Fig. 34.

with it the corresponding stump-slider S, and these sliders correspond to what we called the stump-tumblers in Newell's lock. After that is done, the box BB, which contains those sliders, is moved upwards, and delivers them all to the tooth Q, which holds them in whichever of their notches it happens to receive them. The primary sliders having been brought back by other motions in the lock to their original or neutral position, the box BB cannot be brought down again until all the primary sliders are pushed by the proper key into exactly the same position as they were when they parted with the stump-sliders. This part of the lock is really very simple, and involves no delicate or difficult work, as all the tumblers, all the stump-sliders, and all the little plates which lie between them both are, or ought to be, exactly alike, and may be stamped out of sheet-iron and brass; and the whole thing goes into a very small compass, although the lock itself is very large. We may observe here, that if you were to take the key out of the lock (filing off the small bit like that in the Bramah key, which goes under the cap to keep it in), after the bits are cut off and carried away into the lock, you would not find the key-hole open, but closed at the depth which takes in the bits by a hard steel plate, which slides over it as soon as the box or "carriage" of the tumblers begins to move.

It would be natural to suppose that the cross piece BB at the end of the slider-box is the bolt, as it is prevented from moving down as a bolt usually is, until the stumps can enter the jaws of the tumblers; and this cross piece is, in fact, lifted by a kind of talon turned by the key, just like an ordinary bolt. But, nevertheless, it is not the bolt, but merely locks into the bolt, or rather lifts a lever which does, so that no amount of force which could be brought to bear on the bolt has any tendency to crush the tumblers or sliders; and this is the reason why they can be so small while the lock is very large. The key however cannot be said to be small, for it is even thicker than Newell's; but you might carry only the bits in your pocket, and stick them on to the handle or shank of the key, which may be left anywhere near the lock. Another singular provision is introduced in this lock. The bolt or bolts are not square-cornered as usual, but large round cylinders, case-hardened, so that if you attempt to cut them with a saw they will only roll under it. Figure 35, which is copied from a paper called

the *Scientific American*, shows the general aspect of the lock when the front plate is taken off. All that box marked bb, which is as large as an ordinary lock, moves to the left,

Yale's
Lock.

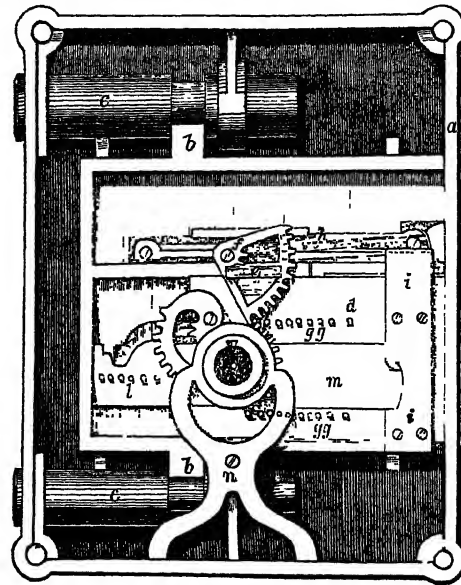


Fig. 35.

and carries the bolts with it when the lock is locked, leaving, of course, some of its parts behind under the key-hole. The piece here marked *ii* is that which we called BB in fig. 34, and it works the lever *b*, which butts against the horizontal piece lying under the tooth-wheel *f*, when the lock-carriage is shot out. It will be understood perhaps by those who are conversant with machinery, how the different parts of this carriage, and the plates which cover it, may be carried backwards and forwards by the toothed wheels and pins shown in this figure; but, as we are convinced that any attempt to explain the details of this machinery, without having the lock itself before you, would be useless, we shall content ourselves with the attempt we have made to give some idea of the general principles of its action. We will only add, that the casting of both these American locks (which have all their heavy parts of cast-iron) is vastly superior to any iron casting we have ever seen made in England; and, on the whole, the United States are evidently far ahead of us in the manufacture of both good and cheap locks; and all because our people are too stupid to substitute machinery for hand-work, and because (as Mr Hobbs said in the discussion at the Society of Arts, on the establishment lately set up by the government for the manufacture of arms at Woolwich), "if the English workmen can do anything to make a machine go wrong, they will; whereas in America they will do all they can to help it." In the same way the American and French manufacturers of clocks have driven our makers both of common clocks and of ornamental clocks out of our own market; and any enterprising manufacturer might very soon finish the business by making both church and house clocks at half the price which is paid for the old-fashioned hand-work of Clerkenwell, and of far better quality.

(E. B. D.)

Locke.

LOCKE, JOHN, whose opinions have been fully discussed, and whose biography has been partly anticipated in the FIRST PRELIMINARY DISSERTATION, was born at Wrington, near Bristol, 29th August 1632. His father had served as a captain under Colonel Popham, in the parliamentary army; and the moderate inheritance of the family had suffered considerably during the civil wars. The young philosopher was the elder of two sons, and received his education at Westminster School, whence (in 1651) he was sent to Christ Church College in Oxford. Here he applied himself diligently to the study of the classics, and made rapid progress in the scholastic philosophy as it was then taught. In after life, however, and probably even before he had quitted the walls of the university, he learned to despise and regret this futile training, and he is said to have frankly acknowledged to Le Clerc, that he learned the first steps in philosophy from one to whom he afterwards proved a worthy antagonist—Descartes. In his reply to Stillingfleet, Locke ascribes to that “justly admired gentleman the great obligation of his first deliverance from the unintelligible way of talking of the philosophy in use in the schools of his time.” After he had taken his degrees in arts, Locke devoted himself to the study of medicine; and, although he neither graduated nor practised, his scientific accuracy procured him a high encomium from Dr Sydenham, in his *Treatise on Acute Diseases*; and his practical skill introduced him to the notice of the first Earl of Shaftesbury, “the false Achitophel” of Dryden’s satire, with whom he continued in undivided friendship to the end. In 1660 Locke wrote a tract on *Church Establishments*, recommending concessions on trivial matters alike to the government, whom he regarded as the friends of liberty, and to the opposition, whom he deemed factious and turbulent demagogues. Finding, however, very soon that he had mistaken the true characters of both parties, his love of truth compelled him to suppress the work and to bury all its misaimed eloquence and indignation. Lord King has preserved some extracts from it, which are valuable as giving us the starting-point of Locke’s opinions. In 1664 Locke visited Berlin as secretary to Sir Walter Vane, envoy from Charles II. to the Elector of Brandenburg, and in the following year he returned to Oxford. Preferment was offered him in the Irish Church, as well as diplomatic employment in Spain or Germany, but both proposals he rejected firmly, hinting in regard to the former, that it was to him an ungrateful stretch of power, to offer “an office of that nature to one who had given no proof of himself, and had never even tried the pulpit.” A more congenial home was provided for him, in 1666, by Ashley Cooper, afterwards Earl of Shaftesbury, who, profiting by his medical skill, invited him to his house, and soon drew him from the peaceful retirement of Oxford to the brilliant circles of the capital. It was by this nobleman that he was introduced to the Duke of Buckingham, the Earl of Northumberland, the Earl of Halifax, and many of the most distinguished men of the period. In 1688 he accompanied the Earl of Northumberland to France; but, on the death of the earl, returned immediately to England to superintend the education of Lord Ashley’s eldest son. So remarkable was the confidence which this nobleman placed in the prudence of the philosopher, that he requested him to choose a wife for his son, a delicate task which he very successfully accomplished. The fruit of this marriage was the third Earl of Shaftesbury, the genial and generous author of the *Characteristics*.

The first sketch of Locke’s work on the *Human Understanding* was made in 1670. He was present one day at a very animated discussion conducted by some learned men at Oxford. He listened attentively to everything that was said, and had the sagacity to perceive that it was after all only a dispute about words. This reflection was the germ of his immortal work. When Lord Ashley ob-

tained an earldom, and was appointed chancellor of the exchequer in 1672, he requested Locke to frame a constitution for the government of Carolina, which Charles II. had gifted to him along with seven other noblemen about nine years before. In the same year Locke obtained the appointment of secretary for the presentation of benefices; and in 1673, when his patron resigned the Great Seal, he became secretary to the Board of Trade. In 1675 Locke visited France for the benefit of his health, and resided at Montpellier, where he acquired the friendship of Mr Herbert (afterwards Earl of Pembroke), to whom he dedicated his *Essay concerning Human Understanding*. Removing soon after to Paris, he was welcomed by the most eminent scientific and literary men. During the whole of his residence abroad, Locke kept a journal of his observations, the pith of which have been preserved in his biography by Lord King. In these he gives the most admirable descriptions of the strange scenes in which he was placed; and in the excitement of new forms of life, the dry logical humour of the philosopher often gives way to a fine pleasantry, not unminged with pathos. The frightful pressure of taxation on the poor of France fills many pages in his journal; and his remarks on homely things are relieved by a dissertation on study, remarks on the immortality of the soul, and an essay on religion, in which he anticipates Tillotson’s argument against the real presence.

In 1679, when the Earl of Shaftesbury had regained his political power, Locke returned to England; but very soon that nobleman was again disgraced, charged with high treason, and compelled to retire to Holland in 1682, whither Locke faithfully followed him. Shaftesbury died in 1683, and his political enemies transferred their hostility to the exiled philosopher. Even at that distance from England he was pursued by the rancour of the government; the English envoy demanded Locke and some other gentlemen from the States-General, on the charge of being concerned in the rebellion of Monmouth. His friends, however, succeeded in keeping him out of sight till concealment was no longer necessary. At Amsterdam he met Limborch, Le Clerc, and other distinguished men, who formed themselves into a philosophical society, and held a weekly meeting for the discussion of interesting questions. At this time Locke was removed from his studentship in Christ Church College by an illegal order of the king; but nothing can be more honourable to his character than the testimony borne to his worth by Bishop Fell, the time-serving tool employed by the king to compass the ruin of his subject. The bishop freely confesses that, “although very frequently, both in public and in private, discourses have been purposely introduced to the disparagement of his master, the Earl of Shaftesbury, his party and designs, he could never be provoked to take any notice, or discover in word or look the least concern.”

In 1686 he published, in one of the *Bibliothèques* of his friend Le Clerc, his *New Method of a Common-place Book*; and in 1687 he abridged his *Essay concerning Human Understanding*, which Le Clerc translated into French, and gave to the world through the same channel. In the *Bibliothèque* of 1688, his first letter to Limborch *On Toleration* appeared; it was published in England in the same year; and it was translated into Latin, and published at Gouda, in 1689. Some theologians at Oxford, who disliked the freedom of the opinions expressed in the essay, attacked them, and Locke defended his work in three additional letters. Some of Locke’s friends were anxious to have him restored in safety to his country. The celebrated William Penn told him that he could get a pardon for him from the king; but being conscious of no crime, Locke declined to accept any pardon. The Earl of Pembroke also assured the king that the stories in circulation about Locke were false, and eventually obtained permission for his return to England. In 1688, he returned to his native country in the same fleet

Locke.

Lockhart.

which brought over the Princess of Orange; and Lord Mordaunt, who had offered him a diplomatic situation, which was modestly declined, succeeded in procuring for him the office of commissioner of appeals. Locke petitioned the king for the recovery of his rights as a student of Christ Church College, but without success.

His most remarkable work, the *Essay concerning Human Understanding*, was first published in England in 1690. Four editions appeared within ten years, and through the medium of Latin and French the author soon acquired a European reputation. Two *Treatises on Civil Government* appeared in 1690, written in support of the principles of the Revolution—the second being a reply to Jonas Proast of Oxford; and in 1693 he published his *Thoughts concerning Education*. He lived during the greater part of the rest of his life in the house of his friend Sir Francis Masham, at Oates; and it is interesting to know that Lady Masham (the daughter of his friend, Dr Cudworth) taught her only son according to the principles laid down in Locke's work on Education. In 1695 he wrote his treatise on *The Reasonableness of Christianity*, which, when attacked by Dr Edwards, was followed up by two *Vindications*. Besides his excellent tract on *The Conduct of the Understanding*, Locke, in his declining years, wrote many other works, chiefly religious, among which may be mentioned his *Discourse on Miracles*; *Paraphrases, with Notes, of the Epistles of St Paul*; an *Essay for the Understanding of St Paul's Epistles, by consulting St Paul himself*; and an *Examination of Father Malebranche's Opinion of Seeing all things in God*. About this time began his friendship with Newton, whose morbid misappreciation of Locke's philosophy and character led to a most affecting correspondence, which is given by Dugald Stewart in his *Dissertation*.

In 1700 Locke's health became so much impaired by his asthmatic complaint, that he objected to receive the emoluments of an office which he was no longer able to fill, and consequently resigned his situation at the Board of Trade. The king himself offered him a still higher position, but this also was declined; and although his public services fully entitled him to receive a pension, he could not be prevailed upon to accept one. Towards the close of his days he took great delight in the study of the Holy Scriptures; and all the finer qualities of his character came out into stronger relief as he approached the confines of another world. On the day before his death he expressed his gratitude to God for the happy life which he had spent. He told his affectionate friend, Lady Masham, that he had now come to the end of his career, and that he would not probably live till the next morning; but when she desired to sit up with him during the night, he begged that she would not do so, and that he would send for her if any change should occur. On the following morning, while Lady Masham was engaged in reading the Psalms to him, he requested her to stop, and in a few minutes expired, on the 28th of October 1704, in the seventy-third year of his age. He was buried in the tomb of the Masham family, in High Laver Church. The best edition of his works is in 10 vols. 8vo, London, 1801 to 1812. (See Lord King's *Life of Locke*, and Dugald Stewart's *Preliminary Dissertation*.)

LOCKHART, JOHN GIBSON, a critical and miscellaneous writer of considerable power and celebrity, was born in the manse or parsonage of Cambusnethan, county of Lanark, in the year 1794. He was the first son by the second marriage of the Rev. John Lockhart, minister of Cambusnethan, with Elizabeth Gibson, daughter of the Rev. Mr Gibson, minister of St Cuthbert's, Edinburgh. The father of Mr Lockhart was afterwards appointed to the College Church, Glasgow, and in this city John received his first education. He distinguished himself at college, and obtained one of the valuable bursaries (worth about £150 per annum) known as Snell's Exhibitions, in virtue

Lockhart.

of which he proceeded to Balliol College, Oxford. He retired from the university with the degree of LL.B., and applied himself to the study of Scottish law. He was called to the bar in 1816, but soon found that he was not calculated to excel as an advocate. He was more attached to literature than to law, and nature had denied him the fluency and self-possession necessary for success in addressing a court or jury. His contemporaries saw with surprise and pain the accomplished, handsome, carefully-dressed advocate, who had been engaged in *quizzing* his associates around the court table, or in drawing clever caricature sketches with his pen, rise up in trepidation to "state a case,"—how he hammered out a few words, got confused, plunged deeper at every step, and at length, fairly losing himself, sat down in an agony of vexation. A more congenial field was opened up by the establishment of *Blackwood's Magazine* in 1817, and for a period of seven or eight years there were few numbers of that periodical which did not contain some pungent or graceful article from the pen of Mr Lockhart. He tried all styles and subjects; he translated from the German and Spanish, reviewed books, indited bitter political articles, full of Oxford Toryism and scholarship, against all Whigs and Cockneys; and no one excelled him either in cold and stinging sarcasm, or in slashing invective. He also sketched scenes and characters with a milder hand, and composed occasional copies of verses, some of which breathed the inspiration of genuine poetry. His position in society was benefited by his marriage, 29th April 1820, with the eldest daughter of Sir Walter Scott. Previous to this Mr Lockhart had, in conjunction with his friend Mr (afterwards Professor) Wilson, written *Peter's Letters to his Kinsfolk*, 3 volumes—a lively but exaggerated picture of Scottish society, character, and manners, including portraits of Scott, Jeffrey, Chalmers, &c. In 1821 appeared his novel of *Valerius*, an exquisite Roman story; in 1822, *Adam Blair*, a Scottish tale of domestic life, containing some powerful painting of the passions; in 1823, a longer novel in 3 volumes, *Reginald Dalton*, delineating English and especially university life; also a translation of *Ancient Spanish Ballads*, remarkable for elegance of style and versification; and, in 1824, another novel in one volume, somewhat in the style of Godwin, entitled *Matthew Wald*. In 1825 Mr Lockhart succeeded to the editorship of the *Quarterly Review*, which he continued to conduct till within a short period of his death. His other works were,—a *Life of Burns*, written for Constable's Miscellany, and published in 1828; a *Life of Napoleon*, contributed to Murray's Family Library; and, in 1836, his *magnum opus*, the *Life of Sir Walter Scott*, which, as originally published, extended to 7 volumes 8vo. This was a work of great difficulty and delicacy. He had to fill a broad canvas with living or recent characters, and with contemporary events. He had to enter a critical arena preoccupied by the greatest names of the age, and to deal with affairs of active life and business, as well as with matters of intellect and imagination. He aimed at strict impartiality; and we have seen a private letter from him, in which he declared that he wrote as if the spirit of Scott, intent only upon truth, looked down upon him at the moment of composition. The alloy of human error, however, could not be absent, and some grave and serious blemishes stained the work. In relating Scott's business transactions, not only was too great prominence given to them, but manifest injustice was done to the Ballantynes, the early associates and friends of the illustrious novelist. Wanton offence and needless pain were also given to other parties by partial and incorrect statements, which no doubt sprung from the author's desire to bring out Scott in bold relief, and to impart variety and vivacity to the memoir. The work, however, is really a great one. We recognise in it Lockhart's manly and independent tone of description, his

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true and penetrating estimate of life and conduct, and the masterly powers of description and analysis which he brought to his task. As a mere literary work, in style and treatment, it must rank in the first class; and as a biography, for fulness and interest, it is only surpassed by Boswell's *Life of Johnson*. Mr Lockhart's *Life of Burns* is an able little work, full of fine moral and picturesque delineation. In the *Quarterly Review* he seemed also to select biography as his chosen field. His critical sketches of Theodore Hook, Campbell, Southey, &c., display the same characteristics as his elaborate works,—the quick eye and firm hand, that never hesitated to use the scalpel freely lest too deep a wound might be inflicted, are visible in the slightest of these dissections of character and conduct. Mr Lockhart's tact and management were no less manifest in the general variety and attractive character of the *Review* while it was under his charge. We meddle not with its political disquisitions, which were often narrow and bitter enough; but he unquestionably made this powerful organ of a party keep pace not only with the literature, the science, and discovery of the age, but with its social tastes, amusements, and fashion. In 1843 Sir Robert Peel rewarded Mr Lockhart with the sinecure appointment of auditor of the duchy of Cornwall, worth L.400 per annum.

The latter years of Mr Lockhart's life were not happy or genial. He had survived his wife and all the other children of Sir Walter Scott. His own family consisted of two sons and a daughter; both his sons predeceased him, but his daughter (married to Mr Hope Scott of Abbotsford) still lives to continue the illustrious line of Scott. Irregular health and study impaired Lockhart's strength, and induced habits of indolence, while his literary ardour was still strong within him, and flashed out at intervals. As he said of Campbell, "A high and supereminent prize seemed still within his reach, but this spur was overmastered by the chill of tremor and the creeping of laziness." He endeavoured, by a winter in Italy, to renovate his shattered constitution, and at first the result was favourable. He returned somewhat invigorated, though feeling acutely that premature old age had set in. He had intended never again to visit Abbotsford after Scott's death; but, in the desolation of his last days, when his spirit was broken and health had utterly fled, he turned to it once more, and his parting spirit was soothed by the attentions of filial duty and tenderness amidst those scenes, immortalized by genius, which had witnessed his youthful ambition and happiness. He died at Abbotsford on the 25th November 1854, having shortly before completed his sixtieth year. (R. C.—S.)

LOCKERBY, a market-town of Scotland, in Dumfriesshire, on the Caledonian Railroad, 13 miles E.N.E. of Dumfries. A considerable trade in pork is carried on; and the largest lamb fair in Scotland is held here annually in August. Market-day, Thursday. Pop. (1851) 1569.

LOCKPORT, a town of the United States of North America, capital of Niagara county, New York, on the Erie Canal, which here descends to the Genesee level by means of ten double combined locks, 23 miles E.N.E. of Niagara Falls by railway. The town contains churches belonging to all the principal denominations, and is plentifully supplied with educational establishments. The main cause of the prosperity of Lockport is the vast water-power it derives from the locks on the Erie Canal, providing its numerous flour, saw, and other mills with abundant motive power. Among the principal of its manufactures are wool, cotton, and iron. A large trade is also carried on with Buffalo, Rochester, and other places by means of the canal. Pop. (1852) about 14,000.

LOCLE, Le, a large scattered village of Switzerland, canton of Neuchâtel, on the Bied, which here disappears in the chasm of a neighbouring rock, 10 miles W.N.W. of Neuchâtel, and 3 miles E. of the French frontier. Its inhabit-

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ants are chiefly employed in clock, watch, and lace making, and the manufacture of trinkets. Not far from the town is a tunnel, 950 feet long, which was excavated in 1806 for the purpose of relieving the valley of the superabundant water occasioned by the melted snow in spring. Pop. 8514.

LOCRI, or LOCRI EPIZEPHYRII, a town of the Greek Locrians in Italy, on the S.E. coast of the Bruttian peninsula. Ephorus ascribes its foundation to the Locri Opuntii; Strabo to the Locri Ozolæ. The former opinion is the more prevalent among ancient writers. The name Locri Epizephyrii favours Strabo's supposition that this settlement was the offshoot of a Locrian settlement at Cape Zephyrium (Capo di Bruzzano). The date of its foundation is uncertain. No less obscurity involves the early history of the Locri until about B.C. 660, when their famous lawgiver, Zaleucus, published his code of laws, supposed to be the earliest written legislative system ever given to any Grecian state. So enduring was the beneficial effect of these institutes, that even in the time of Demosthenes, Locri is cited as an ensample of good government. The next important event in its history is the battle at the River Sagras, in which 10,000 Locrians and a few Rhegian auxiliaries defeated, with great carnage, an army of 130,000 Crotoniats. From a very early period of their history the Locrians were bound by a firm alliance to the Greek city of Syracuse. Nor did their fidelity to that state cease until its tyrant, Dionysius the Younger, took refuge in their city, seized upon their citadel, cruelly oppressed them, and was finally expelled. They were allies of the Romans against Pyrrhus; but after the battle of Cannæ, in 216 B.C., revolted to the Carthaginians, and did not resume the yoke of Rome until 205 B.C. From this period Locri seems to have gradually declined in importance; and after the sixth century, there is no note in any author of its existence. About 5 miles from the modern city Gerace, travellers have discovered its site, containing, among other remains, the fragments of a Doric edifice, supposed to be the temple of Proserpine. Among the celebrated natives of Locri were the poets Erasippus and Xenocritus; the philosophers Acron, Echecrates, and Timæus, said to have been the instructors of Plato in Pythagoreanism; the citharaplayer Eunomus; and the famous boxer Euthymus.

LOCRI, the country of the three Grecian tribes, the Locri Ozolæ, the Locri Epicnemidii, and the Locri Opuntii, is supposed by Niebuhr to have extended originally from the Corinthian Gulf on the W., to the Eubæan Sea on the E., until broken up into two parts by the immigration of the Dorians and Phocians. The Locrians thus became two distinct tribes, differing in manners and civilization, and separated by Doris and Phocis. The eastern tribe, the Locri Epicnemidii and Opuntii, were the more civilized; the western, the Locri Ozolæ, are represented by Thucydides as semi-barbarians even at the time of the Peloponnesian war.

The territory of the *Locri Epicnemidii* and *Opuntii* extended along the shore of the Eubæan Sea, from the pass of Thermopylæ to the mouth of the River Cephissus, and was divided into two parts by a narrow slip of Phocis that runs down to the sea-coast. The southern part was inhabited by the Opuntii, so called from Opus, their chief city. The Epicnemidii held the northern part, and derived their name from Mount Cnemis, the boundary between their country and Bœotia. The towns of the Opuntii were,—Alope, Cynus, Opus, Halæ, Larymna, Calliarus, Naryx, and Corseia; those of the Epicnemidii were,—Alpenus, Nicæa, Scarphe, Thronium, Cnemis, Tarphe (afterwards Pharygæ), and Augeiæ. Homer mentions the eastern Locrians as following Ajax, the son of Oileus, to the Trojan war with forty ships. In the Persian war the Opuntii fought on the side of Leonidas at Thermopylæ, and sent their contingent of seven ships to the Grecian

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fleet. They also joined the Epicnemidii in an alliance with Sparta during the Peloponnesian war.

Locri Ozolæ occupied a district on the Corinthian Gulf, bounded on the E. by Phocis, on the N. by Doris and Ætolia, and on the W. by Ætolia. The origin of their name is uncertain. Different authors severally derive it from the smell (ὀζή) emitted by the sulphur-springs at the foot of Mount Taphiassus, from the fragrance of the asphodel that abounded in the country, and from the undressed skins (ὀζαι) worn by the primitive inhabitants. The Locrians themselves traced it to the branches (ὀζοι) of a vine peculiar to that district. The country is rendered mountainous by off-sets from Mount Parnassus in Phocis, and from Mount Corax in Ætolia. The only river worthy of note is the Hylæthus (Morno). Amphissa, lying near the borders of Phocis, was the most important town of the Ozolæ. The other towns were, — Molycreia, Naupactus, Ceneon, Anticyra, Eupalium, Erythræ, Tolophon, Hesus, Ceanthe, Ipnus, Chalæum, Ægitiium, Hyle, Crocyleium, Messapia, Myonia, Olpæ, Potidania, Teichium, and Tritæa.

LODÈVE, a town of S. France, capital of a cognominal arrondissement in the department of Hérault, on the Ergue, near its junction with the Saloudres, 110 miles W. by N. of Marseilles. It is encompassed by a wall, and its streets are narrow and irregular. The only building worthy of notice is the church of St Etienne, formerly a cathedral, which contains some interesting and beautiful monuments; one of these being a white marble mausoleum inclosing the remains of a Bishop of Lodève. The principal manufactures of the place comprise woollen cloths, soap, and leather: the first being used extensively for army clothing. Dyeing is also carried on here, and a brisk trade in wines, brandy, and fruit. Lodève is the seat of chambers of commerce and manufactures, and a council of *prud'hommes*. Pop. (1851) 10,793.

LODGE, THOMAS, a dramatist, was born about 1556 in Lincolnshire. In 1573 he entered Oxford as a servitor of Trinity College, but left it without taking a degree, and repaired to London. There he seems to have become an actor, and to have begun to write for the stage about 1580, when he produced his *Defence of Stage Plays*, in answer to Gosson's *School of Abuse*. In 1584 he was a student at Lincoln's Inn, and published, among other works, his *Alarum against Usurers*. Soon after this he accompanied Captain Clarke on his voyage to Terceira and the Canaries; and while sailing through the Straits of Magellan, in company with Cavendish, he wrote his *Margerite of America*, which was published in 1596. Some time after this period, according to Wood, he studied medicine, and took a degree at Avignon. On his return to London he is supposed to have practised with great success as a physician, and to have published in 1603 a *Treatise of the Plague*. Wood says he died of the plague in September 1625.

As a dramatist, he is placed by Collier "in a rank superior to Greene, but in some respects inferior to Kyd." His extant plays are two—*The Wounds of Civil War* lively set forth in the true Tragedies of Marius and Sylla, 4to, 1594, reprinted in the last edition of Dodsley's *Old Plays*; and *A Looking-Glass for London and England*, written in conjunction with Greene, published 1594, and after passing through several editions, reprinted in 1617. A collection of his pastoral and lyric poetry was published in 1819. His novel, entitled *Rosalynde: Euphues Golden Legacie*, 4to, 1590 (reprinted in Collier's *Shakspeare's Library*, 1840), furnished Shakspeare with the framework of the plot in "As You Like It."

LODI, an episcopal and walled city of N. Italy, capital of a cognominal province of Lombardy, on the right bank of the Adda, a tributary of the Po, 18 miles S.E. of Milan. It consists of well-built streets, and a great square, and

contains several interesting public buildings. The principal of these are,—the cathedral, in the Lombard style of architecture, with many fine pictures and carvings; the church of the *Incoronata*, founded in 1476, also containing some interesting paintings; the bishop's palace; and the town-house, a plain but handsome edifice. Besides these there are a royal college, a gymnasium, a theological school, three hospitals, a public library, and several churches and convents. The manufactures of the place consist of delft, pottery, linen, and silk. A large trade is carried on in Parmesan cheese, made in the neighbourhood. The ancient Laus Pompeia occupied a site 5 miles W. of the modern Lodi. It was, according to Pliny, settled by the Boii, a Gallic tribe, and afterwards became a Roman municipality. In the middle ages, under the name of Lodi, it became of such importance that it provoked the jealousy of the Milanese, who took and destroyed it in 1158. The inhabitants were then removed by the Emperor Frederick to the present city, which, however, never rose to the importance of its original. The site of Laus Pompeia is now occupied by a village called Lodi Vecchio. Pop. of Lodi, 18,986. In modern times Lodi is famous for the contest which took place on its bridge over the Adda, between the French under Bonaparte and the Austrians, on which occasion the latter were signally defeated.

LODI, a province of Lombardy, or Austrian Italy, in the government of Milan, bounded N. by Bergamo and Milan, E. by Cremona and Brescia, S. by the duchy of Parma, and W. by Pavia and Milan. It is about 28 miles in length from E. to W., by nearly the same in breadth, and contains an area of 290,359 acres. The surface is flat, or gently undulating. The soil is rich and well cultivated. The chief rivers are the Po, which separates the province from Parma, the Adda, the Lambro, and the Serio. Irrigation is also extensively carried on here, especially for the production of rich pasture. The chief products are rice, maize, flax, cheese, wine, and silk. The last has been much attended to of late, and the growing of mulberry trees is rapidly extending. The cheese of Lodi called Parmesan, is famous, and its manufacture gives employment to a large number of the inhabitants. The province is divided into 7 districts, 175 communes, and 160 parishes. In the eighteenth century it formed the two provinces of Lodi and Crema; the former belonging to Milan, and the latter to Venice. Pop. (1850) 222,166. See also **LOMBARDY**.

LOFODEN ISLANDS, a large group of islands off the N.W. coast of Norway, stretching N.E. to S.W. from N. Lat. 67. 30. to 69. 30., and E. Long. 12. to 16. 30. The group resembles the vertebrae of an animal in form; the islands fitting into each other so closely, that from a distance they seem to form one long continent. The islands, which are all of a granite or limestone formation, are precipitous and very lofty; the hills of Vaagoe rising almost perpendicularly to a height of 4000 feet above the sea. The channels which separate them are narrow, tortuous, and generally of great depth. The largest islands of the group are in the N., viz., Hindoe, Andoe, and Langoe; the first being separated from the mainland by a passage about a mile in width. The tail of the chain is formed of a number of smaller islands, the chief of which are the two Vaagoes, Moskenösoe, Væroe, and Rost, separated from the mainland by West Fiord. This gulf is much dreaded by mariners when the wind is S.W., on account of the great swell which rolls in from the North Sea, and which is especially dangerous at the Mälstroem channel between Væroe and Moskenösoe. The mean temperature of the group ranges from 23° in winter to 50° in summer, which, considering the high latitude, is comparatively mild. This is caused, however, by the exposure of the group to the gulf stream. Large shoals of herring and cod frequent the Lofodens annually, and attract to these islands a large

Lodi
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Lofoden
Islands.

Logan. {concourse of fishing-boats from several hundreds of miles of sea-coast. In the inclement months of February and March, generally about 3000 boats (mostly open) assemble here for the cod-fishing, each having, on an average, five of a crew, while the aggregate number of fish taken amounts to more than three millions. These are chiefly dried in the sun and wind, without salt, and sent to Tromsøe, Trondhjem, Bergen, &c., along with large quantities of cod-liver oil and cod-roë, for exportation or home consumption. The cod-fishery ends in April, and is followed by the herring-fishing, which is carried on till the boisterous season at the end of autumn. The permanent population of the Lofodens is very small, considering the extent of territory, and is sustained principally by the fisheries. Some cattle, however, are kept in the most sheltered parts of the island, where good pasturage is obtained in the summer. Steilo, in the island of Ulvo, is the chief village of the group, and has communication with the ports of the mainland by means of a steamer, which visits the Lofodens in summer. Estimated pop. of group, 4000.

LOG, in nautical language, is a piece of wood usually in the form of a quadrant, with a radius of six inches. About a quarter of an inch in thickness, it is so loaded with a leaden plate, fastened to its circular side, that it swims in the water in a perpendicular position, with two-thirds under the surface.

LOG-LINE, *The*, used in navigation so early as 1570, and alluded to by Bourne in 1577, is a small cord with one end attached to the log, and the other to a revolving reel on board the ship. When the log is thrown overboard it keeps its place, as already described, while the log-line is unwound from the reel as the ship moves on, so that the length of line unwound in a given time indicates the rapidity of the ship's motion. The length of line given out is determined by pieces of coloured cloth called *knots* attached to it at distances of 50 feet, while the time is ascertained by a sand-glass of a given number of seconds, which bear nearly the same proportion to an hour that 50 feet bear to a mile. The number of knots, therefore, unwound from the reel in half a minute is the number of miles nearly which the ship runs in an hour. The log-line used by the royal navy is 48 feet in length.

LOGAN, JOHN, the author of the *Ode to the Cuckoo* and other poems, was the son of a small farmer, and was born at Fala, county of Edinburgh, in 1748. After receiving his elementary education at Musselburgh, he entered the University of Edinburgh in 1762, with the intention of becoming a dissenting minister. There he studied the learned languages with great success, cultivating at the same time, in the society of his class-fellow, Michael Bruce, his native taste for poetry. In 1766 he entered the class of rhetoric and belles-lettres; and having attracted the notice of the professor, Dr Blair, by a critical paper on the *Spectator*, he was recommended by him, in 1768, as tutor to Mr, afterwards Sir John, Sinclair, the eminent statist. This situation he soon relinquished, and returning to Edinburgh, he resumed his theological studies in connection with the Established Church. In 1770, editing the works of his deceased friend, Michael Bruce, he introduced indiscriminately among them several poems of his own, which were afterwards claimed for the former poet. Of these, the most disputed, because the best, is the well-known *Ode to the Cuckoo*. Its authorship is now generally ascribed to Logan, on the ground that, long before its publication, he showed it to many of his friends as his own, and that his claim was never questioned during his life—proofs which the weight of evidence in favour of Bruce fails to balance. Some of Logan's most popular hymns are also said (and perhaps justly) to have been perfected out of some unformed thoughts and images that Bruce left in MS. In 1773 he was licensed as a preacher, and was appointed minister of South Leith.

Not content with the high excellence which he soon attained as an eloquent preacher, he applied himself to historical studies; and at Edinburgh, in 1779, delivered a course of lectures on the philosophy of history, which were published in a condensed form in 1781. So marked did he become in this new capacity, that he would undoubtedly have been promoted, in 1780, to the chair of universal history at Edinburgh, had it not been an invariable custom for the patrons to elect a member of the Scottish bar. In 1781 were published his *Lecture on the Manners and Government of Asia* and the first edition of his *Poems*; and after a year the latter reached a second edition. In 1783 Logan produced his *Runnemedie*, a tragedy founded on the granting of the Magna Charta. On account of some political allusions, it was interdicted by the Lord Chamberlain during its rehearsal at Covent Garden Theatre; but it was acted the same year at Edinburgh, though with little success. His parishioners, offended at this unclerical use of his talents, now openly condemned him; and in 1786, being charged with drunkenness, he was forced to retire upon a part of his stipend. He had repaired to London in the preceding year, and devoted himself to literature. Besides several contributions to the *English Review*, he produced, in 1788, *A Review of the Principal Charges against Mr Hastings*, a pamphlet which advocated the defendant so ably, that the friends of the impeachment arraigned the publisher, Stockdale, for a breach of the privileges of the House of Commons. In the same year Logan published, under the name of Dr Rutherford, *A View of Ancient History*. After a lingering illness, he died on 28th December 1788.

His friend Dr Robertson published the first volume of his *Sermons* in 1790, and the second in 1791. Among his MSS. were also found, but never published, four tragedies (two of which were unfinished), six lyric poems, several parts of an intended periodical called the *Guardian*, and twenty-five *Lectures on Roman History*.

Logan's peculiar merit lay in the successful treatment of old and familiar themes,—a gift peculiar alike to a popular preacher and a lyric poet. Subjects that had become faded and worn through frequent handling, were rendered new and attractive to the eye by the fine polish of his diction, and the fresh hues of his fancy. The literary ability and the tender pathos of his sermons have saved them from that neglect to which kindred works are, with few exceptions, doomed. Of his poems, the best are the *Ode to the Cuckoo* and the *Hymns* forming part of the paraphrases used by the Church of Scotland. The latter are pervaded by a delicate and often plaintive strain of feeling. The simple diction and finely-woven fancies of the former entitle its author to a high rank as a lyricist. A third edition of Logan's *Poems*, accompanied by his *Life*, was published in 1805. A new edition of his *Sermons*, with a *Life* prefixed, appeared in London, 1810.

LOGGAN, DAVID, an engraver of considerable reputation, was born at Dantzic in 1635. He received the first lessons of his art from Simon Passe in Denmark, and subsequently, on paying a visit to Holland, he further perfected himself in the study under the guidance of Hondius. He came to England in the time of the Commonwealth, and engaged in engraving portraits and landscape pieces. The first work of Loggan, however, which attracted general notice, and gained for its author very considerable reputation, was his views of the Universities of Oxford and Cambridge. Having married into a good family near Oxford in 1672, he took up his residence there, and shortly afterwards published a large folio volume of plates: *Habitus Academicorum Oxoniæ, a Doctore ad Servientem*, by David Loggan, *Gedaniensis, Universitatis Oxoniæ Chalographus*. His engravings are remarkable for the neatness and accuracy of their execution, but this quality sometimes degenerates into stiffness and formality.

Loggan. {

LOGARITHMS.

I.—HISTORY OF LOGARITHMS.

History. THE labour and time required for performing the arithmetical operations of multiplication, division, and the extraction of roots, were at one time considerable obstacles to the improvement of various branches of knowledge, and in particular the science of astronomy. But about the end of the sixteenth century and the beginning of the seventeenth, several mathematicians began to consider by what means they might simplify these operations, or substitute for them others more easily performed. Their efforts produced some ingenious contrivances for abridging calculations; but of these the most complete by far was that of John Napier, baron of Merchiston, in Scotland, who invented a system of numbers called *logarithms*, so adapted to the numbers to be multiplied or divided, that these being arranged in the form of a table, each opposite the number called its logarithm, the product of any two numbers in the table was found opposite that formed by the addition of their logarithms; and, on the contrary, the quotient arising from the division of one number by another was found opposite that formed by the subtraction of the logarithm of the divisor from that of the dividend; and similar simplifications took place in the still more laborious operations of involution and evolution. But before we proceed to relate more particularly the circumstances of this invention, it will be proper to give a general view of the nature of logarithms, and of the circumstances which render them of use in calculation.

Let there be formed two series of numbers, the one constituting a geometrical progression, whose first term is unity or 1, and the common ratio any number whatever; and the other an arithmetical progression, whose first term is 0, and the common difference also any number whatever; for example, suppose the common ratio of the geometrical series to be 2, and the common difference of the arithmetical series 1, and let them be written thus:

Geom. Prog.	Arith. Prog.
1	0
2	1
4	2
8	3
16	4
32	5
64	6
128	7
256	8
512	9
1024	10
2048	11
4096	12
&c.	&c.

Here the terms in the arithmetical series are called the *logarithms* of the corresponding terms of the geometrical series; that is, 0 is the logarithm of 1, and 1 is the logarithm of 2, and 2 is the logarithm of 4, and 3 that of 8, and so on.

From the manner in which the two series are related to each other, it will readily appear by induction that the logarithms of the terms of the geometrical series have the two following properties:

1. The sum of the logarithms of any two numbers or terms in the geometrical series is the logarithm of that number, or term of the series, which is equal to their product.

For example, let the terms of the geometrical series be 4 and 32; the corresponding terms of the arithmetical series (that is, their logarithms) are 2 and 5: now the product of the numbers is 128, and the sum of their logarithms is 7; and it appears by inspection of the two series, that the latter number is the logarithm of the former, agreeing with the proposition we are illustrating. In like manner, if the numbers or terms of the geometrical series be 16 and 64, the logarithms of which are 4 and 6, we find from the table that $10 = 4 + 6$ is the logarithm of $1024 = 16 \times 64$; and so of any other numbers in the table.

2. The difference of the logarithms of any two numbers or terms of the geometrical series is the logarithm of that term which is the quotient arising from the division of the one number by the other.

Take, for example, the terms 128 and 32, the logarithms of which are 7 and 5; the greater of these numbers divided by the less is 4, and the difference of their logarithms is 2; and by inspecting the two series, this last number will be found to be the logarithm of the former. In like manner, if the terms of the geometrical series be 1024 and 16, the logarithms of which are 10 and 4, we find that $1024 \div 16 = 64$, and that $10 - 4 = 6$; now, in the table, the latter number, viz. 6, is the logarithm of the former, 64.

These two properties of logarithms, the second of which indeed is an immediate consequence of the first, enable us to find with great facility the product or the quotient of any two terms of a geometrical series to which there is adapted an arithmetical series, so that each number has its logarithm opposite to it, as in the preceding short table. For it is evident, that to multiply two numbers, we have only to add their logarithms, and opposite to that logarithm which is the sum we shall find the product required. Thus, to multiply 16 by 128; to 4 the logarithm of 16, add 7 the logarithm of 128, and opposite the sum 11, we find 2048, the product sought. On the other hand, to divide any number in the table by any other, we subtract the logarithm of the divisor from that of the dividend, and look for the remainder among the logarithms, and opposite to it we find the number sought. Thus, to divide 2048 by 128; from 11, the logarithm of 2048, we subtract 7, the logarithm of 128, and opposite the remainder 4, we find 16, the quotient sought.

Let us now suppose any number of geometrical means to be interposed between each two adjoining terms of the preceding geometrical series, and the same number of arithmetical means between every two adjoining terms of the arithmetical series; then, as the results will still be a geometrical and an arithmetical series, the interpolated terms of the latter will be the logarithms of the corresponding terms of the former, and the two new series will have the very same properties as the original series.

If we suppose the number of interpolated means to be very great, it will follow that among the terms of the resulting geometrical series, some one or other will be found nearly equal to any proposed number whatever. Therefore, although the preceding table exhibits the logarithms of 1, 2, 4, 8, 16, &c. but does not contain those of the intermediate numbers, 3, 5, 6, 7, 9, 10, &c. yet it is easy to conceive that a table might be formed by interpolation which should contain, amongst the terms of the geometrical series, all numbers whatever to a certain extent (or at least others very nearly equal to them), together with their logarithms. If such a table were constructed, or at least if such terms

History. of the geometrical progression were found, together with their logarithms, as were either accurately equal to, or coincided nearly with, all numbers within certain limits (for example, between 1 and 100,000), then, as often as we had occasion to multiply or divide any numbers contained in that table, we might evidently obtain the products or quotients by the simple operations of addition and subtraction.

The first invention of logarithms has been attributed by some to Longomontanus, and by others to Juste Byrge, two mathematicians contemporary with Napier; but there is no reason to suppose that either of these anticipated him, for Longomontanus never published any thing on the subject, although he lived thirty-three years after Napier had made known his discovery; and as to Byrge, he is indeed known to have printed a table containing an arithmetical and a geometrical progression written opposite to each other, so as to form in effect a system of logarithms of the same kind as those invented by Napier, without however explaining their nature and use, although it appears from the title he intended to do so, but was probably prevented by some cause unknown to us. But this work was not printed till 1620, six years after Napier had published his discovery, namely, in 1614, in a book entitled *Mirifici Logarithmorum Canonis Descriptio*; but he reserved the construction of the numbers till the opinion of the learned concerning his invention should be known. It is therefore with good reason that Napier is now universally considered as the first, and most probably the only inventor. His work contains a table of the natural sines and cosines, and their logarithms, for every minute of the quadrant, as also the differences between the logarithmic sines and cosines, which are in effect the logarithmic tangents. There is no table of the logarithms of numbers; but precepts are given, by which they, as well as the logarithmic tangents, may be found from the table of natural and logarithmic sines.

In explaining the nature of logarithms, Napier supposes some determinate line which represents the radius of a circle to be continually diminished, so as to have successively all possible values, and thus to be equal to every sine, one after another, throughout the quadrant. And he supposes this diminution to be effected by a point moving from one extremity towards the other extremity (or rather some point very near it), with a motion that is not uniform, but decreases gradually in such a manner, that if the whole time between the beginning and the end of the motion be conceived to be divided into a very great number of equal portions, the decrements taken away in each of these shall be to one another as the respective remainders of the line. According to this mode of conceiving the line to decrease, it is easy to show that at the end of any successive equal intervals of time from the beginning of the motion, the portions of the line which remain will constitute a decreasing geometrical progression.

Again, he supposes another line to be generated by a point which moves along it equably, or which passes over equal intervals of it in equal times. Thus the portions of the line generated at the end of any equal successive intervals of time from the beginning of the motion will form a series of quantities in arithmetical progression. Now if the two motions be supposed to begin together, the remainders of the one line at the end of any equal intervals of time will form a series of quantities in geometrical progression, while the corresponding portions generated of the other line will constitute a series in arithmetical progression, so that the latter will be the logarithms of the former. And as the terms of the geometrical progression decrease continually from radius, which is the greatest term, to 0, while the terms of the corresponding arithmetical progression increase from 0 upwards, according to Napier's system the logarithm of radius is 0, and the logarithms of the sines

from radius down to 0 are a series of numbers increasing from 0 to infinity.

The velocities or degrees of quickness with which the motions commence may have to each other any ratio whatever, and by assuming different ratios we obtain different systems of logarithms. Napier supposed the initial velocities to be equal; but the system of logarithms produced in consequence of this assumption having been found to have some disadvantages, it has been long superseded by a more convenient one, as we shall presently have occasion to explain.

Napier's work having been written in Latin, was translated into English by Mr Edward Wright, an ingenious mathematician of that period, and inventor of the principles of what is commonly though erroneously called *Mercator's sailing*. The translation being sent to Napier for his perusal, was returned with his approbation, and with the addition of a few lines, intimating that he intended to make some alterations in the system of logarithms in a second edition. Mr Wright died soon after he received back his translation; but it was published after his death in 1616, accompanied with a dedication by his son to the East India Company, and a preface by Henry Briggs, who afterwards distinguished himself by improving the form or system of logarithms. Mr Briggs likewise gave in this work the description and draught of a scale which had been invented by Wright, as also various methods of his own for finding a logarithm to a given number, and a number to a given logarithm, by means of Napier's table, the use of which had been attended with some inconvenience, on account of its containing only such numbers as were the natural sines to every minute of the quadrant and their logarithms. There was an additional inconvenience in using the table, arising from the logarithms being partly positive and partly negative. The latter of these was, however, well remedied by John Speidell in his *New Logarithms*, first published in 1619, which contained the sines, cosines, tangents, cotangents, secants, and cosecants, and given in such a form as to be all positive; and the former was still more completely removed by an additional table, which he gave in the sixth impression of his work in 1624, and which contained the logarithms of the integers 1, 2, 3, 4, &c. to 1000, together with their differences and arithmetical complements, &c. This table, which is of great use in finding fluents, is commonly called *hyperbolic logarithms*, because the numbers serve to express the areas contained between a hyperbola and its asymptote, and limited by ordinates drawn parallel to the other asymptote. This name, however, is certainly improper, as the same spaces may represent the logarithms of any system whatever.

In 1619, Robert Napier, son of the inventor of logarithms, published a second edition of his father's *Logarithmorum Canonis Descriptio*; and, along with this, the promised *Logarithmorum Canonis Constructio*, and other pieces written by his father and Mr Briggs. An exact copy of the same two works in one volume was also printed in 1620 at Lyons in France. In 1618 or 1619, Benjamin Ursinus, mathematician to the elector of Brandenburg, published Napier's tables of logarithms in his *Cursus Mathematicus*, to which he added some tables of proportional parts; and in 1624 he printed his *Trigonometria*, with a table of natural sines, and their logarithms of the Napierian kind and form, to every ten seconds of the quadrant.

In the same year, 1624, the celebrated John Kepler published, at Marburg, logarithms of nearly the same kind, under the title of *Chilias Logarithmorum ad totidem Numeros Rotundos, præmissa Demonstratione legitima Ortus Logarithmorum eorumque Usus*, &c.; and in the following year he published a supplement to this work. In the

History. preface to this last he says, that several of the professors of mathematics in Upper Germany, and more especially those who were advanced in years, and grown averse to new methods of reasoning which carried them out of their old principles and habits, doubted whether Napier's demonstration of the property of logarithms was perfectly true, and whether the application of them to trigonometrical calculations might not be unsafe, and lead the calculator who should trust in them to erroneous results; and in either case, whether the doctrine were true or not, they scarcely considered Napier's demonstration of it as legitimate and satisfactory. This opinion induced Kepler to compose the above-mentioned work, in which the whole doctrine is treated in a manner strictly geometrical, and free from the considerations of motion to which those elderly Germans had objected.

On the publication of Napier's Logarithms, Mr Henry Briggs, some time professor of geometry in Gresham College, London, and afterwards Savilian professor of geometry at Oxford, applied himself with great earnestness to the study and improvement of them. From the particular view which Napier took of the subject, and the manner in which he conceived logarithms to be generated, it happened that in his system the logarithms of a series of numbers which increased in a decuple ratio (as 1, 10, 100, 1000, &c.) formed a decreasing arithmetical series, whose common difference was 2.3205851. But it occurred to Briggs that it would be better and more conformable to the received decimal notation, to adopt a system in which the logarithms of the terms of such a geometrical series should differ from each other by unity or 1. This idea Briggs communicated to the public in his lectures, and also to Napier himself. He even went twice to Edinburgh to converse with him on the subject; and, on his first visit, Napier said that he had also formerly thought of the same improvement, but that he chose to publish the logarithms he had previously calculated, till such time as his health and convenience would allow him to make others more commodious. And whereas, in the change which Briggs proposed, it was intended to make the logarithms of the sines to increase from 0 (the logarithm of radius) to infinity, whilst the sines themselves should decrease, it was suggested to him by Napier that it would be better to make them increase, so that 0, instead of being the logarithm of radius, should be the logarithm of 1, and that 100,000, &c. should be the logarithm of radius. This Briggs admitted would be an improvement; and having changed the numbers he had already calculated so as to make them suit Napier's modification of his plan, he returned with them next year to Edinburgh, and submitted them to his perusal.

It appears, therefore, that whether Napier or Briggs was the inventor of this improved system of logarithms which has since been universally adopted, Napier had suggested to begin with the low number 1, and to make the logarithms, or the artificial numbers, as he had always called them, to increase with the natural numbers, instead of decreasing; which, however, made no alteration in the figures, but only in their affections or signs, changing them from negative to positive.

On Briggs's return from Edinburgh, in 1617, he printed the first thousand logarithms to eight places of figures, besides the index, with the title of *Logarithmorum Chilias prima*; but these seem not to have been published till after the death of Napier, for in his preface he expresses a hope that the circumstances which led to a change in the system would be explained in Napier's posthumous work, about to appear. But although Napier had intimated in a note he had given in Wright's translation of the *Canon Mirificus*, as well as in his *Rabdologia*, printed in 1617, that he intended to alter the scale, yet he does not state

History. that Briggs was the first to think of this improvement, or to publish it. And as nothing was said on this point in Napier's posthumous work published in 1619 by his son, Briggs took occasion, in his *Arithmetica Logarithmica*, to assert his claims to the improvement which he had carried into execution. But he has by no means proved that he himself, and not Napier, was the first who had thought of such improvements.

In 1620, Mr Edmund Gunter published his *Canon of Triangles*, which contains the artificial or logarithmic sines and tangents to every minute to seven places of figures besides the index, the logarithm of radius being 10. These logarithms are of the kind which had been agreed upon between Napier and Briggs, and they were the first tables of logarithmic sines and tangents that were published of this sort. Gunter also, in 1623, reprinted the same in his book *De Sectoris et Radio*, together with the *Chilias prima* of Briggs; and in the same year he applied the logarithms of numbers, sines, and tangents, to straight lines drawn upon a ruler. This instrument is now in common use for navigation and other purposes, and is commonly called *Gunter's Scale*.

The discoveries in logarithms were carried to France by Mr Edmund Wingate, but not first of all, as he says in the preface to his book. He published at Paris in 1624 two small tracts in French upon logarithms, which were reprinted with improvements at London in 1626.

In the year 1624, Briggs published his *Arithmetica Logarithmica*, a stupendous work, considering the short time he had been in preparing it. He there gives the logarithms of 30,000 natural numbers to fourteen places of figures, besides the index; namely, from 1 to 20,000, and from 90,000 to 100,000, together with the differences of the logarithms. He also gives an ample treatise on their construction and use, and he earnestly solicits others to undertake the computation of the intermediate numbers, offering to give instructions, and paper ready ruled for that purpose, to any person inclined to contribute to the completion of so valuable a work. By this invitation, he had hopes of collecting materials for the logarithms of the intermediate 70,000 numbers, whilst he should employ his time upon the Canon of Logarithmic Sines and Tangents, and so carry on both works at once.

Soon after this, Adrian Vlacq or Flack of Gouda, in Holland, completed the intermediate 70 chiliads, and republished the *Arithmetica Logarithmica* in 1627 and 1628, with these intermediate numbers, making in all the logarithms of all numbers to 100,000, but only to 10 places of figures. To these was added a table of artificial sines, tangents, and secants, to every minute of the quadrant.

Briggs himself lived also to complete a table of logarithmic sines and tangents, to the 100th part of every degree to fourteen places of figures, besides the index, together with a table of natural sines to the same parts to fifteen places, and the tangents and secants of the same to ten places, with the construction of the whole. But death prevented him from completing the application and uses of them. However, when dying, he committed this to his friend Henry Gellibrand, who accordingly added a preface, and the application of the logarithms to plane and spherical trigonometry. The work was called *Trigonometria Britannica*, and was printed at Gouda in 1633, under the care of Adrian Vlacq, who in the same year printed his own *Trigonometria Artificialis, sive Magnus Canon Triangulorum Logarithmicus ad Decadas Secundorum Scrupulorum Constructus*. This contains the logarithmic sines and tangents to 10 places of figures, with their differences for every ten seconds in the quadrant. It also contains Briggs's table of the first 20,000 logarithms to ten places, besides the index, with their differences; and to the whole is prefixed a description of the tables and their applications,

History. chiefly extracted from Briggs's *Trigonometria Britannica* just mentioned.

Gellibrand also published, in 1635, *An Institution Trigonometrical*, containing the logarithms of the first 10,000 numbers, with the natural sines, tangents, and secants, and the logarithmic sines and tangents, for degrees and minutes; all to seven decimal places.

The writers whose works we have hitherto noticed were for the most part computors of logarithms. But the system best adapted to practice being now well ascertained, and the labour of constructing the table accomplished, succeeding writers on the subject have had little more to do than to give the tables in the most convenient form. It is true, that in consequence of the numerous discoveries which were afterwards made in mathematics, particularly in the doctrine of series, great improvements were made in the method of computing logarithms; but these, for the most part, came too late to be of use in the actual construction of the tables, although they might be applied with advantage to verify calculations previously performed by methods much more laborious, and to detect various errors which had crept into the numbers.

As it is of importance that such as have occasion to employ logarithms should know what works are esteemed for their extent and accuracy, we shall mention the following:

Sherwin's *Mathematical Tables*, in 8vo. These contain the logarithms of all numbers to 101,000; and the sines, tangents, secants, and versed sines, both natural and logarithmic, to every minute of the quadrant. The third edition, printed in 1742, which was revised by Gardiner, is esteemed the most correct; but, in the fifth edition, the errors are so numerous, that no dependence can be placed on it.

Gardiner's *Tables of Logarithms* for all numbers to 101,000, and for the sines and tangents to every ten seconds of the quadrant; also for the sines of the first 72 minutes to every single second, &c. This work, which is in quarto, was printed in 1742, and is held in high estimation for its accuracy. An edition of the same work, with some additions, was printed in 1770, at Avignon, in France; and another by Callet at Paris in 1783, with farther improvements. The tables in both are to seven places of figures.

Hutton's *Mathematical Tables*, containing common, hyperbolic, and logistic logarithms, &c. and much valuable information respecting the history of logarithms, and other branches of mathematics connected with them.

Taylor's *Table of Logarithmic Sines and Tangents to every second of the quadrant*; to which is prefixed an able introduction by Dr Maskelyne, and a table of logarithms from 1 to 100,000, &c. This is a most valuable work; but being a large quarto volume, and rather expensive, it is less accessible than the preceding, which is an octavo, at a moderate price.

Tables portatives des Logarithmes, contenant les Logarithmes des nombres depuis 1 jusqu'à 108,000; les logarithmes des sinus et tangentes, de seconde en seconde pour les cinq premiers degrés, de dix en dix secondes pour tous les degrés du quart de cercle, et suivant la nouvelle division centésimale de dix-millième en dix millième, &c. par Callet. This work is in octavo, and printed in stereotype by Didot.

There are various smaller sets of tables; but probably the most accurate of all are those which Professor Babbage has produced with his very ingenious calculating machine, which has enabled him to detect a variety of errors in former tables. But, what is rather amusing, on examining a set of tables printed in the Chinese character, and which, like every Chinese invention, were older than the deluge, Mr Babbage found they contained

precisely the same errors as those of Vlacq did; thus proving, as had long been suspected, from what source those original inventors had derived their logarithms.

In addition to these, it is proper that we should notice a stupendous work relating to logarithms, originally suggested by the celebrated Carnot, in conjunction with Prieur de la Côte d'Or, and Brunet de Montpellier, about the beginning of the French revolution. This enterprise was committed in 1794 to the care of Baron de Prony, a mathematician of great eminence, who was *not only to compose tables which should leave nothing to be desired with respect to accuracy, but to make them the most extended and most striking monument of calculation ever executed or imagined*. Two manuscript copies of the work, composed of seventeen volumes large folio, contained, besides an introduction,

1. The natural sines for each 10,000th part of the quadrant, calculated to twenty-five places of decimals, to be published with twenty-two decimals and five columns of differences.

2. The logarithms of these sines, calculated to fourteen decimals, with five columns of differences.

3. The logarithms of the ratios of the sines to the arcs for the first five thousand 100,000th parts of the quadrant, calculated to fourteen decimal places, with three columns of differences.

4. The logarithms of the tangents corresponding with the logarithms of the sines.

5. The logarithms of the ratios of the tangents to the arcs, calculated like those of the third article.

6. Logarithms of numbers from 1 to 100,000, calculated to nineteen places of decimals.

7. The logarithms of numbers from 100,000 to 200,000, calculated to twenty-four decimals, in order to be published to twelve decimals and three columns of differences.

The printing of this work, though begun by the French government, was afterwards suspended.

Shortrede's Tables.—These tables contain the logarithms to numbers from 1 to 120,000, and numbers to logarithms from 0 to 1.00000; tables with centesimal and decimal arguments for finding logarithms and antilogarithms, as far as sixteen and twenty-five places; tables to five places for finding the logarithms of the sums and differences of antilogarithms, &c.; tables of natural sines, cosines, &c., to every second of arc in the quadrant; tables containing angles which every point and quarter-point of the compass makes with the meridian in points and degrees; tables of logarithmic sines, cosines, tangents, &c., to every second of the circle, with arguments in space and time.

II.—NATURE OF LOGARITHMS AND THEIR CONSTRUCTION.

The first step to be taken in constructing a system of logarithms is to assume the logarithm of some determinate number, besides that of unity or 1, which must necessarily be 0. From the particular view which Napier first took of the subject, he was led to assume unity for the logarithm of the number 2.718282, by which it happened that the logarithm of 10 was 2.302585; and this assumption being made, the form of the system became determinate, and the logarithm of every number fixed to one particular value.

It was, however, soon observed, that it would be better to assume unity for the logarithm of 10, instead of making it the logarithm of 2.718282, as in Napier's first system; and hence the logarithms of the terms of the geometrical progression

1, 10, 100, 1000, 10,000, &c.

were necessarily fixed to the corresponding terms of this arithmetical progression,

0, 1, 2, 3, 4, &c.

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That is, the logarithm of 1 being 0, and that of 10 being 1, the logarithm of 100 is 2, that of 1000 is 3, and so on.

The logarithms of the terms of the progression 1, 10, 100, 1000, &c. being thus determined; in order to form the logarithms of the numbers between 1 and 10, and between 10 and 100, and so on, we must conceive a very great number of geometrical means to be interposed between each two adjoining terms of the preceding geometrical series, and as many arithmetical means between the corresponding terms of the arithmetical series; then, like as the terms of the arithmetical series 0, 1, 2, 3, &c. are the logarithms of the corresponding terms of the geometrical series 1, 10, 100, 1000, &c. the interpolated terms of the former will also be the logarithms of the corresponding interpolated terms of the latter. Now, by supposing the number of means interposed between each two terms of the geometrical series to be sufficiently great, some one or other of them may be found which will be very nearly equal to any proposed number. Hence, to find the logarithm of such a number, we have only to seek for one of the interpolated means which is very nearly equal to it, and to take the logarithm of that mean as a near value of the logarithm required.

As a particular example, let it be required to find the logarithm of 5, according to Briggs's system.

First step of the process.—The number 5 is between 1 and 10, the logarithms of which we already know to be 0 and 1: Let a geometrical mean be found between the two former, and an arithmetical mean between the two latter. The geometrical mean will be the square root of the product of the numbers 1 and 10, which is 3.162277; and the arithmetical mean will be half the sum of the logarithms 0 and 1, which is 0.5; therefore the logarithm of 3.162277 is 0.5. But as the mean thus found is not sufficiently near the proposed number, we must proceed with the operation as follows:

Second step.—The number 5, whose logarithm is sought, is between 3.162277, the mean last found, and 10, the logarithms of which we know to be 0.5 and 1; we must now find a geometrical mean between the two former, and an arithmetical mean between the two latter. The one of these is $\sqrt{(3.162277 \times 10)} = 5.623413$, and the other is $\frac{1 + 0.5}{2} = 0.75$, the logarithm of 5.623413.

Third step.—We have now obtained two numbers, namely, 3.162277 and 5.623413, one on each side of 5, together with their logarithms 0.5 and 0.75; we therefore, proceeding as before, find the geometrical mean, or $\sqrt{(3.162277 \times 5.623413)}$, to be 4.216964, and the arithmetical mean $\frac{0.5 + 0.75}{2} = 0.625$, the logarithm of 4.216964.

Fourth step.—We proceed in the same manner with the numbers 4.216964, and 5.623413 (one of which is less and the other greater than 5), and their logarithms 0.625 and 0.75, and find a new geometrical mean, viz. 4.869674, and the corresponding arithmetical mean or logarithm 0.6875.

We must go on in this way till we have found twenty-two geometrical means, and as many corresponding arithmetical means or logarithms. And that we may indicate how these are found from each other, let the numbers 1 and 10 be denoted by A and B, and their geometrical means taken in their order by C, D, E, &c. then the results of the successive operations will be as in the following table:

	Numbers.	Logarithms.
A =	1.000000	0.000000
B =	10.000000	1.000000
C = \sqrt{AB}	3.162277	0.500000
D = \sqrt{BC}	5.623413	0.750000
E = \sqrt{CD}	4.216964	0.625000

Numbers. Logarithms.

F = \sqrt{DE}	4.869674	0.6875000
G = \sqrt{DF}	5.232991	0.7187500
H = \sqrt{FG}	5.048065	0.7031250
I = \sqrt{FH}	4.958069	0.6953125
K = \sqrt{HI}	5.002865	0.6992187
L = \sqrt{IK}	4.980416	0.6972656
M = \sqrt{KL}	4.991627	0.6982421
N = \sqrt{KM}	4.997242	0.6987304
O = \sqrt{KN}	5.000052	0.6989745
P = \sqrt{NO}	4.998647	0.6988525
Q = \sqrt{OP}	4.999350	0.6989135
R = \sqrt{OQ}	4.999701	0.6989440
S = \sqrt{OR}	4.999876	0.6989592
T = \sqrt{OS}	4.999963	0.6989668
V = \sqrt{OT}	5.000008	0.6989707
W = \sqrt{TV}	4.999984	0.6989687
X = \sqrt{WV}	4.999997	0.6989697
Y = \sqrt{VX}	5.000003	0.6989702
Z = \sqrt{XY}	5.000000	0.6989700

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As the last of these means, viz. Z, agrees with 5, the proposed number, as far at least as the sixth place of decimals, we may safely consider them as very nearly equal, and therefore their logarithms very nearly equal; that is, the logarithm of 5 will be 0.6989700 nearly.

In performing the operations indicated in the preceding table, it is necessary to find the geometrical means at the beginning to many more figures than are here put down, in order to insure at last a result true to 7 decimal places. Thus it appears that the labour of computing logarithms by this method is indeed very great. It is, however, that which was employed by Briggs and Vlacq in the original construction of logarithms; but since their time more easy methods have been found, some of which we shall presently have occasion to explain, and to illustrate by actual computation.

The logarithm of any number whatever may be found by a series of calculations similar to that just explained. But in constructing the table it would only be necessary to have recourse to this method in calculating the logarithms of prime numbers; for as often as the logarithm of a number which was the product of other numbers, whose logarithms were known, was required, it would be immediately obtained by adding together the logarithms of its factors. On the contrary, if the logarithm of the product of two numbers were known, and also that of one of its factors, the logarithm of the other factor would be obtained from these, by simply taking their difference.

From this last remark it is obvious, that having now found the logarithm of 5, we can immediately find that of 2; for since 2 is the quotient of 10 divided by 5, its logarithm will be the difference of the logarithms of 10 and 5; now the logarithm of 10 is 1, and that of 5 is 0.6989700, therefore the logarithm of 2 is 0.3010300.

Having thus obtained the logarithms of 2 and 5, in addition to those of 10, 100, 1000, &c. we may thence find the logarithms of innumerable other numbers. Thus, because $4 = 2 \times 2$, the logarithm of 4 will be the logarithm of 2 added to itself, or will be twice the logarithm of 2. Again, because $5 \times 10 = 50$, the logarithm of 50 will be the sum of the logarithms of 5 and 10. In this manner it is evident we may find the logarithms of $8 = 2 \times 4$, of $16 = 2 \times 8$, of $25 = 5 \times 5$, and of as many more such numbers as we please.

Besides the view we have hitherto taken of the theory of logarithms, there are others under which it has been presented by different authors. Some of these we proceed to explain, beginning with that in which they are defined to be the *measures of ratios*; but to see the propriety of this definition, it must be understood what is meant by the measure of a ratio.

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According to the usual definition of a compound ratio, if there be any number of magnitudes A, B, C, D, in continued proportion, the ratio of the first, A, to the third, C, is considered as made up of two ratios, each equal the ratio of the first, A, to the second, B. And in like manner the ratio of the first, A, to the fourth, D, is considered as made of three ratios, each equal the same ratio of the first to the second, and so on. Thus, to take a particular example in numbers, because the ratio of 81 to 3 may be considered as made up of the ratio of 81 to 27, and of 27 to 9, and of 9 to 3, which three ratios are equal among themselves, the ratio of 81 to 3 will be triple that of 9 to 3; and in like manner the ratio of 27 to 3 will be double that of 9 to 3. Also, because the ratios of 1000 to 100, 100 to 10, 10 to 1, are all equal, the ratio of 1000 to 1 will be three times as great as that of 10 to 1; and the ratio of 100 to 1 will be twice as great; and so on.

Taking this view of ratios, and considering them as a particular species of quantities, made up of others of the same kind, they may evidently be compared with each other in the same manner as we compare lines or quantities of any kind whatever. And as, when estimating the relative magnitude of two quantities, two lines, for example, if the one contains five such equal parts as the other contains seven, we say the one line has to the other the proportion of 5 to 7; so, in like manner, if two ratios be such, that the one can be resolved into five equal ratios, and the other into seven of the same ratios, we may conclude that the magnitude of the one ratio is to that of the other as the number 5 to the number 7; and a similar conclusion may be drawn, when the ratios to be compared are any multiples whatever of some other ratio.

Since lines and other quantities, which admit of no common measure, are said to be incommensurable to each other, the same will obviously happen to ratios; that is, there may be two ratios such, that into whatever number of equal ratios the one is divided, the other cannot possibly be exactly equal to a ratio composed of any integral number of these. We may, however, conceive the number of equal ratios into which the one is divided to be so great, that a certain number of them shall compose a ratio more nearly equal to the other ratio than by any assignable difference. Therefore, like as we can always find numbers which shall have among themselves, either accurately, or as nearly as we please, the same ratios as lines or other magnitudes have to each other, and which therefore may be taken as the measures or representatives of the lines; so also, corresponding to any system of ratios, there may be always found a series of numbers which will have the same proportions among themselves as the ratios have to each other, and which may in like manner be called the *measures of the ratios*.

Let us now suppose that unity, or 1, is assumed as the common consequent or second term of all ratios whatever; and that the ratio of 10 (or some particular number) to 1 is compounded of a very great number of equal ratios, as, for example, 1,000,000: then, as each of these will be very near the ratio of equality (for it will be the ratio of the first term to the second of a series consisting of one million and one continued proportionals, the first of which is 10 and last 1), it will follow, and is easy to conceive, that the ratios of all other numbers to unity will each be very nearly equal to some multiple of that small ratio. And by supposing the number of small equal ratios of which the ratio of 10 to 1 is composed, to be sufficiently great, the ratios of all other numbers to unity may be as nearly equal to ratios which are multiples of that small ratio, as we please. Let us still suppose, however, for the sake of illustration, that the number of small ratios contained in that of 10 to 1 is 1,000,000; then, as it may be proved that the ratio of 2 to 1 will be very nearly the same as a ratio

composed of 301,030 of these, and that the ratio of 3 to 1 will be nearly equal to a ratio composed of 477,121 of them, and that the ratio of 4 to 1 will be nearly equal to a ratio composed of 602,060 of them, and so on; these numbers, viz. 1,000,000, 301,030, 477,121, and 602,060, or any other numbers proportional to them, will be the *measures* of the ratios of 10 to 1, 2 to 1, 3 to 1, and 4 to 1, respectively; and the same quantities will also be what have been called the *logarithms* of the ratios; for the word *logarithm*, if regard be had to its etymology, is *λογῶν ἀριθμοί*, or the numbers of small and equal ratios (or *ratiunculae*, as they have been called) contained in the several ratios of quantities one to another.

We have, for the sake of illustration, assumed 1,000,000 as the measure of the ratio of 10 to 1, by which it happens, as already observed, that the measures of the ratios of 2 to 1, 3 to 1, &c. are 301,030 and 477,121 respectively; as, however, these measures are not absolute, but relative quantities, we may assume any other numbers whatever instead of these, provided they are proportional to them. Accordingly, we may assume 1 as the measure or logarithm of the ratio of 10 to 1; and then the logarithms of the ratios of 2 to 1, 3 to 1, &c. instead of being 301,030, 477,121, &c. will be .301030 and .477121, &c. respectively, that is, each will be one millionth of what it was before.

In Briggs's system, the logarithm of the ratio of 10 to 1, or, to speak briefly, the logarithm of 10, is unity; but we are at liberty to assume any number whatever, as that whose logarithm shall be unity. Napier, in consequence of his particular views, chose 2,718,282; and hence it happens that the logarithms of the ratios are expressed by different numbers in the two systems.

But, to show the identity of the properties of logarithms, as explained in the two different views now given of the subject, let A and B denote any two numbers. The ratio of their product to unity, that is, the ratio of $A \times B$ to 1, is compounded of the ratio of A to 1 and of B to 1; and consequently the logarithm of the ratio of $A \times B$ to 1 will equal the sum of the logarithms of the ratios of A to 1, and of B to 1; or, in other words, the logarithm of $A \times B$ will be the sum of the logarithms of A and B. Now, $\log. (A \times B) = \log. A + \log. B$, therefore, $\log. B = \log. (A \times B)$

— $\log. A$. Let $\frac{C}{D}$ be substituted for B, and D for A, then (because $A \times B = D \times \frac{C}{D} = C$) we have $\log. \frac{C}{D} = \log. C - \log. D$.

Such is a short sketch of the theory of logarithms as deducible from the doctrine of ratios. It was in this way that the celebrated Kepler treated the subject; and he has been followed by Mercator, Halley, and Cotes, as well as by mathematicians of later times, as by Baron Masenius in his Trigonometry. The same mode was likewise adopted in the posthumous works of Dr Robert Simson. As, however, the doctrine of ratios is very abstract, and the mode of reasoning upon which it has been established is of a peculiar and subtle kind, we presume that the greater number of readers will think this view of the subject less simple and natural than the following, in which we mean to deduce the theory of logarithms, as well as the manner of computing them, from the properties of the exponents of powers.

The common scale of notation in arithmetic is so contrived as to express all numbers whatever by the powers of 10, which is the root of the scale, and the nine digits serving as co-efficients to these powers. Thus, if R denote 10, the root of the scale, so that R^2 will denote 100, and R^3 1000, and so on, the number 471,509 is otherwise expressed by $4R^5 + 7R^4 + 1R^3 + 5R^2 + 0R^1 + 9R^0$, which is

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+ $\frac{2}{R} + \frac{4}{R^2} + \frac{3}{R^3}$, or by $3R^2 + 7R^1 + R^0 + 2R^{-1} + 4R^{-2} + 3R^{-3}$. As to vulgar fractions, by transforming them to decimals, they may be expressed in the same manner. Thus $\frac{2}{3} = .375 = 3R^{-1} + 7R^{-2} + 5R^{-3}$. Also $\frac{2}{3} = .666$, &c. $= 6R^{-1} + 6R^{-2} + 6R^{-3} + \&c.$

But instead of expressing all numbers by the sums of certain multiples of the successive powers of some particular number, we may also express them, if not accurately, at least as near as we please, by a single power, whole or fractional, of any positive number whatever, which may be either whole or fractional, but must not be unity.

Let us take, for example, 2 as the number, by the powers of which all others are to be expressed. Then it may be shown that the numbers 1, 2, 3, &c. are all expressible by the powers of 2, as follows.

$$\begin{array}{ll} 1 = 2^0 & 6 = 2^{2.58496} \text{ nearly} \\ 2 = 2^1 & 7 = 2^{2.8073} \text{ nearly} \\ 3 = 2^{1.58496} \text{ nearly} & 8 = 2^3 \\ 4 = 2^2 & 9 = 2^{3.1699} \text{ nearly} \\ 5 = 2^{2.3219} \text{ nearly} & 10 = 2^{3.3219} \text{ nearly} \end{array}$$

and so on. And if instead of 2 we take the number 10, then we have

$$\begin{array}{ll} 1 = 10^0 & 6 = 10^{.77815} \\ 2 = 10^{.30103} & 7 = 10^{.84510} \\ 3 = 10^{.47712} & 8 = 10^{.90309} \\ 4 = 10^{.60206} & 9 = 10^{.95424} \\ 5 = 10^{.69897} & 10 = 10^1. \end{array}$$

Hence we may conclude, that if r be put for some determinate number, and n for any indefinite positive number, whole or fractional, it is always possible to find another number N , such that r being raised to the power N , shall either be exactly equal to n , or as near it as we please; that is, we shall have $r^N = n$.

When numbers are expressed in this way by the powers of some given number r , the exponent of that power of r which is equal to any assigned number is called the logarithm of that number. Thus, if $r^N = n$ (n being put for any number), N is the logarithm of n .

The logarithms which are produced by giving to r some determinate value, constitute a system of logarithms; and the constant number r , from which the system is formed, is called the base, radix, or radical number of the system.

The properties of logarithms may readily be deduced from the above definition as follows: Let a and b be any two numbers, and A and B their logarithms; then r being supposed to denote the base or radical number of the system, we have $a = r^A$ and $b = r^B$: now if we take the product of a and b , we have $a b = r^A \times r^B = r^{A+B}$; but, according to the definition, $A+B$ is the logarithm of $a b$ (for it is the index of that power of r which is equal to $a b$), therefore the sum of the logarithms of any two numbers a and b is the logarithm of their product $a b$. Again, we

have $\frac{a}{b} = \frac{r^A}{r^B} = r^{A-B}$, but here $A-B$, being the index

of that power of r which is equal to $\frac{a}{b}$, is the logarithm of $\frac{a}{b}$;

hence, if one number a be divided by another b , the difference between their logarithms is the logarithm of the quotient $\frac{a}{b}$.

Let n express any number whatever, then raising both sides of the equation $a = r^A$ to the n th power, we have $a^n = (r^A)^n = r^{nA}$; but here nA is manifestly the logarithm of a^n ; therefore, the logarithm of a^n , any power of a number, is the product of the logarithm of the number by n , the index of the power. This must evidently be true, whether n be a whole number or a fraction, positive or negative.

From these properties, it is easy to see in what manner a table exhibiting the logarithms of all numbers within certain limits may be applied to simplify calculations; for since the sum of the logarithms of any two numbers is the logarithm of their product, it follows, that as often as we have occasion to find the product of two or more numbers, we have only to add their logarithms taken from the table into one sum, and to look for the number whose logarithm is equal to that sum, and this number will be the product required. Also, because the difference between the logarithm of the dividend and that of the divisor is the logarithm of the quotient, whenever we have occasion to divide one number by another, we have only to subtract the logarithm of the divisor from that of the dividend, and opposite to that logarithm in the table, which is the remainder, we find the quotient.

As the logarithm of any power of a number is the product of the logarithm of the number by the index of the power; and, on the contrary, the logarithm of any root of a number is the quotient found by dividing the logarithm of the number by the index of the root; it follows that we may find any power or root of a number by multiplying the logarithm of the number by the index of the power, or dividing it by the index of the root, and taking that number in the table whose logarithm is the product or quotient for the power or root required.

If in the equation $a = r^A$ (where a is any number, A its logarithm, and r the base of the system) we suppose $a = 1$, then $r^A = 1$; but this equation can only be satisfied by $A = 0$. Hence it appears, that in every system of logarithms, the logarithm of unity must be 0. If, on the other hand, we assume $a = r$, then we have the equation $r = r^A$, which is immediately satisfied by putting $A = 1$; therefore, the logarithm of the base, or radical number of every system, is necessarily unity.

If we suppose r and a to be each a positive number greater than unity, then A will be a positive number; for

if it be a negative we would have $a (= r^{-A} = \frac{1}{r^A})$, a pro-

per fraction, and at same time a number greater by hypothesis than unity, which is absurd. If, on the contrary, we suppose a a proper fraction, then A must necessarily be negative, otherwise r^A would be greater than unity, and $a (= r^A)$ also greater than unity, while by hypothesis it is a fraction less than unity, which is absurd. Therefore, in every system, the base of which exceeds unity, the logarithm of a whole or mixed number is always positive, but the logarithm of a proper fraction is always negative.

Because the logarithm of r is unity, that of r^n will be n ; therefore, the logarithm of any integral power of the radical number r will always be an integer.

Let r and r' denote bases of two different systems; and let A be the logarithm of a number, a , taken according to the first of these, and A' its logarithm according to the second. Then, because $a = r^A$, and $a = r'^{A'}$, it follows that $r^A = r'^{A'}$, and $r = r'^{\frac{A'}{A}}$. Let us now suppose that r'' is the base of a third system of logarithms, and R and R' ,

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the logarithms of r and r' , taken according to this third system; then, because

$$r^R = r, \quad r'^{R'} = r';$$

we have $r^R R' = r'^{R'} R'$, $r^R R' = r'^{R'} R'$;

therefore $r^R = r'^{R'}$, and $r = r'^{\frac{R}{R'}}$; but we have already

found $r = r'^{\frac{A'}{A}}$, therefore $r'^{\frac{A'}{A}} = r'^{\frac{R}{R'}}$, and consequently

$$\frac{A'}{A} = \frac{R}{R'}, \text{ and } A : A' :: R' : R :: \frac{1}{R} : \frac{1}{R'}$$

Hence it appears, that the logarithm of a number, taken according to one system, has to its logarithm, taken according to any other system, a constant ratio, which is the same as that of the reciprocals of the logarithms of the radical numbers of those systems.

Let us next suppose that a and b are two numbers, and A and B their logarithms, taken according to the same system, and r the base of the system; then, because

$$r^A = a, \quad r^B = b;$$

we have $r^{AB} = a^B$, $r^{AB} = b^A$;

therefore $a^B = b^A$, and $a = b^{\frac{A}{B}}$. Now as r is not found in this equation, the value of the fraction $\frac{A}{B}$ depends only on a and b ; therefore, the logarithms of any two given numbers have the same ratio to each other in every system.

Having now explained the properties which belong to the logarithms of any system, we proceed to investigate general rules by which the number corresponding to any logarithm, and, on the contrary, the logarithm corresponding to any number, may be found the one from the other. And for this end let us denote any number whatever by y , and its logarithm by x , and put r as before for the base or radical number of the system; then, by the nature of logarithms,

$$y = r^x.$$

Put $r = 1 + a$, and let the expression $(1 + a)^x$ be expanded into a series by the binomial theorem; thus

$$y = 1 + xa + \frac{x(x-1)}{1 \cdot 2} a^2 + \frac{x(x-1)(x-2)}{1 \cdot 2 \cdot 3} a^3 + \frac{x(x-1)(x-2)(x-3)}{1 \cdot 2 \cdot 3 \cdot 4} a^4 + \&c.$$

Let this series, the terms of which are arranged according to the powers of a , be transformed into another, whose terms shall be arranged according to the powers of x ; and to effect this we must find the actual products of the factors which constitute the powers of a , and arrange the terms anew, as follows:

$$\begin{aligned} 1 &= 1, \\ xa &= + ax, \\ \frac{x(x-1)}{1 \cdot 2} a^2 &= -\frac{a^2}{2} x + \frac{a^2}{2} x^2, \\ \frac{x(x-1)(x-2)}{1 \cdot 2 \cdot 3} a^3 &= +\frac{a^3}{3} x - \frac{a^3}{2} x^2 + \frac{a^3}{6} x^3, \\ \frac{x(x-1)(x-2)(x-3)}{1 \cdot 2 \cdot 3 \cdot 4} a^4 &= -\frac{a^4}{4} x + \frac{11a^4}{24} x^2 - \frac{a^4}{4} x^3 + \frac{a^4}{24} x^4, \\ &\&c. \qquad \qquad \&c. \end{aligned}$$

so that adding into one sum the quantities on each side of the sign $=$, and recollecting that the sum of those on the left-hand side is equal to y , we have

$$y = r^x = \begin{cases} 1 \\ + (a - \frac{a^2}{2} + \frac{a^3}{3} - \frac{a^4}{4} + \&c.) x \\ + (\frac{a^2}{2} - \frac{a^3}{2} + \frac{11a^4}{24} - \&c.) x^2 \\ + (\frac{a^3}{6} - \frac{a^4}{4} + \&c.) x^3 \\ + (\frac{a^4}{24} - \&c.) x^4 \\ + \&c. \end{cases}$$

$$\text{Put } A = a - \frac{a^2}{2} + \frac{a^3}{3} - \frac{a^4}{4} + \&c.$$

$$A' = \frac{a^2}{2} - \frac{a^3}{2} + \frac{11a^4}{24} - \&c.$$

$$A'' = \frac{a^3}{6} - \frac{a^4}{4} + \&c.$$

$$A''' = \frac{a^4}{24} - \&c.$$

&c.

$$\text{then } r^x = 1 + Ax + A'x^2 + A''x^3 + A'''x^4 + \&c.$$

Next, to determine the law of connection of the quantities $A, A', A'', \&c.$ since the last equation is to hold good whatever be the value of the variable quantity, a similar equation may be formed with the same co-efficients, and having $x + z$ for its variable (z being any indefinite quantity); thus we have also

$$r^{x+z} = 1 + A(x+z) + A'(x+z)^2 + A''(x+z)^3 + \&c.$$

But $r^{x+z} = r^x \times r^z$, and since it has been shown that

$$r^x = 1 + Ax + A'x^2 + A''x^3 + A'''x^4 + \&c.$$

for the same reason

$$r^z = 1 + Az + A'z^2 + A''z^3 + A'''z^4 + \&c.$$

therefore the series

$$1 + A(x+z) + A'(x+z)^2 + A''(x+z)^3 + A'''(x+z)^4 + \&c.$$

is equal to the product of the two series

$$1 + Ax + A'x^2 + A''x^3 + A'''x^4 + \&c.$$

$$1 + Az + A'z^2 + A''z^3 + A'''z^4 + \&c.$$

That is, by the actual involution of the former and multiplication of the two latter,

$$\begin{aligned} & \left. \begin{aligned} 1 + Ax + A'x^2 + A''x^3 + A'''x^4 + \&c. \\ + Az + 2A'xz + 3A''x^2z + 4A'''x^3z + \&c. \\ + A'z^2 + 3A''xz^2 + 6A'''x^2z^2 + \&c. \\ + A''z^3 + 4A'''xz^3 + \&c. \\ + A'''z^4 + \&c. \end{aligned} \right\} = \\ & = \left\{ \begin{aligned} 1 + Ax + A'x^2 + A''x^3 + A'''x^4 + \&c. \\ + Az + A^2xz + AA'x^2z + AA''x^3z + \&c. \\ + A'z^2 + AA'xz^2 + A'A'x^2z^2 + \&c. \\ + A''z^3 + AA''xz^3 + \&c. \\ + A'''z^4 + \&c. \end{aligned} \right. \end{aligned}$$

Now the quantities $A, A', A'', \&c.$ being quite independent of x and z , the two sides of the equation can only be identical, upon the supposition that the co-efficients of like terms in each are equal; therefore, setting aside the first line of each side of the equation, because their terms are the same, and also the first term of the second line, for the same reason, let the co-efficients of the remaining terms be put equal to one another. Thus we have

$$\left. \begin{aligned} A^2 &= 2A'A' \\ AA' &= 3A'' \\ AA'' &= 4A''' \\ &\&c. \end{aligned} \right\} \text{ and hence we have } \begin{cases} A' = \frac{A^2}{1 \cdot 2} \\ A'' = \frac{A^3}{1 \cdot 2 \cdot 3} \\ A''' = \frac{A^4}{1 \cdot 2 \cdot 3 \cdot 4} \\ \&c. \end{cases}$$

Here the law of the co-efficients $A, A', A'', \&c.$ is obvious,

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Construction of Logarithms. each being formed from the preceding by multiplying it by A, and dividing by the exponent of the power of A, which is thus formed. Let these values of A', A'', &c. be now substituted in the equation

$$y = r^x = 1 + Ax + A'x^2 + A''x^3 + \&c.$$

and it becomes

$$y = 1 + Ax + \frac{A^2}{1 \cdot 2}x^2 + \frac{A^3}{1 \cdot 2 \cdot 3}x^3 + \frac{A^4}{1 \cdot 2 \cdot 3 \cdot 4}x^4 + \&c.$$

Thus we have obtained a general formula expressing a number in terms of its logarithm and the base of the system, for we must recollect that since $a = r - 1$, the quantity A, which is equal to

$$a - \frac{a^2}{2} + \frac{a^3}{3} - \frac{a^4}{4} + \frac{a^5}{5} - \&c.$$

is otherwise expressed by

$$r - 1 - \frac{(r-1)^2}{2} + \frac{(r-1)^3}{3} - \frac{(r-1)^4}{4} + \frac{(r-1)^5}{5} - \&c.$$

where r denotes the base of the system.

If in the formula

$$r^x = 1 + Ax + \frac{A^2}{1 \cdot 2}x^2 + \frac{A^3}{1 \cdot 2 \cdot 3}x^3 + \frac{A^4}{1 \cdot 2 \cdot 3 \cdot 4}x^4 + \&c$$

we suppose $x = 1$, it becomes

$$r = 1 + A + \frac{A^2}{1 \cdot 2} + \frac{A^3}{1 \cdot 2 \cdot 3} + \frac{A^4}{1 \cdot 2 \cdot 3 \cdot 4} + \&c.$$

an equation which contains r only; but as r has been all along supposed an indeterminate quantity, this equation must be identical, that is, if, instead of A, its value, as expressed above in terms of r , were substituted, the equation would become $r = r$.

Again, let us suppose that $\frac{1}{A}$ is substituted instead of x in the general formula; thus it becomes

$$r^{\frac{1}{A}} = 1 + 1 + \frac{1}{1 \cdot 2} + \frac{1}{1 \cdot 2 \cdot 3} + \frac{1}{1 \cdot 2 \cdot 3 \cdot 4} + \&c.$$

Thus the quantity $r^{\frac{1}{A}}$, whatever be the value of r , is evidently equal to a constant number, which, as appears from the last equation, is equal to the value of r when $A = 1$. By adding together a sufficient number of terms of the last series, we find it nearly equal to

$$2.7182818284590452353602874.$$

If this be denoted by e , we have $r^{\frac{1}{A}} = e$, and $r = e^A$; hence, if the number e be considered as the base of a logarithmic system, the quantity A, namely,

$$r - 1 - \frac{(r-1)^2}{2} + \frac{(r-1)^3}{3} - \frac{(r-1)^4}{4} + \frac{(r-1)^5}{5} - \&c.$$

is the logarithm of r to the base e . But as r is not restricted here to any particular value, we may substitute y instead of it, keeping in mind that y denotes any number whatever, and x its logarithm; thus we have x the logarithm of y , expressed by the series

$$y - 1 - \frac{(y-1)^2}{2} + \frac{(y-1)^3}{3} - \frac{(y-1)^4}{4} + \frac{(y-1)^5}{5} - \&c.$$

supposing that the base of the system is the number we have expressed above by e .

We have now found a general formula for the logarithm of any number y , taken according to a particular system, namely, that which has the number e for its base. But it is easy from hence to find a formula, which shall apply to any system whatever. For it has been shown that the logarithms of the same number, taken according to two different systems, are to each other as the reciprocals of the

logarithms of the bases of the systems, these last logarithms being taken according to any system whatever, that is,

$$\log. y \text{ to base } e : \log. y \text{ to base } r :: \frac{1}{\log. e} : \frac{1}{\log. r};$$

hence we find

$$\log. y \text{ to base } r = \frac{\log. e}{\log. r} \times \log. y \text{ to base } e.$$

Let the value already found for the logarithm of y to base e be substituted in this equation, and it becomes

$$\log. y = x = \frac{\log. e}{\log. r} \left\{ y - 1 - \frac{(y-1)^2}{2} + \frac{(y-1)^3}{3} - \frac{(y-1)^4}{4} + \&c. \right\}$$

which is a general formula for the logarithm of any number whatever, to the base r . And it is to be recollected

that in the fraction $\frac{\log. e}{\log. r}$, which is a common multiplier to the series, the logarithms are to be taken according to the same base, which however may be any number whatever.

If in the above formula we suppose $r = e$, the multiplier $\frac{\log. e}{\log. r}$ will be unity, and the formula will become simply

$$\log. y = y - 1 - \frac{(y-1)^2}{2} + \frac{(y-1)^3}{3} - \frac{(y-1)^4}{4} + \&c.$$

as we have already remarked. Now this is the system which was adopted by Lord Napier; and although the logarithms which were computed according to this system, or upon the supposition that the radical number is 2.7182818, &c. have been called *hyperbolic logarithms*, because they happen to be proportional to certain hyperbolic spaces, yet, as the logarithms of every system have the same property, it is more proper to call them *Napierian logarithms*.

As the constant multiplier $\frac{\log. e}{\log. r}$, which occurs in the general formula for the logarithm of any number, is the only part of the formula which depends for its value upon the base of the system, it has been called by writers on logarithms the *modulus* of the system. If we suppose the logarithms taken to the base e , then the numerator, viz. $\log. e$, will be unity, and the denominator will be the Napierian logarithm of r . If however we suppose the logarithms taken to the base r , then the numerator will be $\log. e$ to base r ; and the denominator will be unity, so that the *modulus* of any system whose base is r , is the reciprocal of the Napierian logarithm of that base; or it is the logarithm of the number e (the base of the Napierian system) to the base r .

In the Napierian system, the *modulus* is unity, and hence the logarithms of this system are more easily computed than those of any other. It was, however, soon found that a system whose base should be the same as the root of the scale of the arithmetical notation, viz. the number 10, would be the most convenient of any in practice; and accordingly such a system was actually constructed by Mr Briggs. This is the only one now in common use, and is called *Briggs's system*, also the *common system* of logarithms. The *modulus* of this system therefore is the reciprocal of the Napierian logarithm of 10, viz. .43429448, which is the common logarithm of $e = 2.7182818$, &c. the base of the Napierian system. We shall in future denote this *modulus* by M; so that the formula expressing the common logarithm of any number y will be

$$\log. y = M \left\{ 1 - y - \frac{(1-y)^2}{2} + \frac{(1-y)^3}{3} - \frac{(1-y)^4}{4} + \&c. \right\}$$

If the number y , whose logarithm is required, be very near

Construction of Logarithms. to unity, so that $1 - y$ is a small quantity, then the logarithm may be found from this formula with great ease, because the series will converge very rapidly. If, however, $1 - y$ be greater than unity, the series, instead of converging, will diverge, so as to be, in its present form, of no use.

It may, however, be transformed into another, which shall converge in every case, by substituting in it $\sqrt[n]{y}$ instead of y , and observing that $\log. (\sqrt[n]{y}) = \frac{\log. y}{n}$;

it thus becomes

$\log. y = nM \left\{ \sqrt[n]{y} - 1 - \frac{1}{2}(\sqrt[n]{y} - 1)^2 + \frac{1}{3}(\sqrt[n]{y} - 1)^3 - \&c \right\}$ where n may denote any number, positive or negative. But whatever be the number y , we can always take n , such, that $\sqrt[n]{y}$ shall be as near to 1 as we please; therefore, by this last formula, we can always find the logarithm of y to any degree of accuracy.

If n be taken negative, then $\sqrt[n]{y} = \frac{1}{\sqrt[n]{y}}$, and the series for $\log. y$ becomes, by changing the signs,

$$\log. y = nM \left\{ 1 - \frac{1}{\sqrt[n]{y}} + \frac{1}{2} \left(1 - \frac{1}{\sqrt[n]{y}} \right)^2 + \frac{1}{3} \left(1 - \frac{1}{\sqrt[n]{y}} \right)^3 + \&c. \right\}$$

where all the terms are positive. Thus we have it in our power to express the value of y , either by a series which shall have its terms all positive, or by one which shall have its terms alternately positive and negative: for it is evident that if y be greater than unity, $\sqrt[n]{y}$ will also be greater than unity, and *vice versa*; but the differences will be so much the smaller as n the exponent of the root is greater; therefore $\sqrt[n]{y} - 1$ will be positive in the first case, and negative in the second.

Because Nap. $\log. 10 = \frac{1}{M}$, we have by the two last formulas

$$\frac{1}{M} = n \left\{ \sqrt[n]{10} - 1 - \frac{1}{2}(\sqrt[n]{10} - 1)^2 + \frac{1}{3}(\sqrt[n]{10} - 1)^3 - \&c. \right\}$$

also

$$\frac{1}{M} = n \left\{ 1 - \frac{1}{\sqrt[n]{10}} + \frac{1}{2} \left(1 - \frac{1}{\sqrt[n]{10}} \right)^2 + \frac{1}{3} \left(1 - \frac{1}{\sqrt[n]{10}} \right)^3 + \&c. \right\}$$

It is evident, that by giving to $\sqrt[n]{y}$ such a value that $\sqrt[n]{y} - 1$ is a fraction less than unity, we render both the series for the value of $\log. y$ converging; for then the expression $1 - \frac{1}{\sqrt[n]{y}}$ will also be less than unity, seeing

it is equal $\frac{\sqrt[n]{y} - 1}{\sqrt[n]{y}}$. Therefore, in the first series, the

second and third terms (taken together as one term) constitute a negative quantity; and as the same is also true of the fourth and fifth, and so on, the amount of all the terms after the first is a negative quantity, or one which is to be subtracted from the first, to obtain the value of $\log. y$. Hence

$$\log. y < nM(\sqrt[n]{y} - 1).$$

And since, on the contrary, the terms of the second series are all positive, the amount of all the terms after the first is a positive quantity, or one which must be added to the first to give the value of $\log. y$; so that

$$\log. y > nM \left(1 - \frac{1}{\sqrt[n]{y}} \right).$$

Thus we have two limits to the value of the logarithm

of y , which, by taking the number n sufficiently great may come as near to each other as we please.

In like manner we find two limits to the value of the reciprocal to the modulus, viz.

$$\frac{1}{M} < n(\sqrt[n]{10} - 1), \quad \frac{1}{M} > n \left(1 - \frac{1}{\sqrt[n]{10}} \right).$$

It is evident that the difference between the two limits of $\log. y$, is

$$nM \left\{ (\sqrt[n]{y} - 1) - \left(1 - \frac{1}{\sqrt[n]{y}} \right) \right\},$$

therefore, if we take either the one or the other of the two preceding expressions for $\log. y$, the error in excess or defect is necessarily less than this quantity.

By these formulæ we may depend upon having the logarithm of any number true to n figures, if we give to n such a value that the root $\sqrt[n]{y}$ shall have m ciphers between the decimal point and the first significant figure on the right. So that in general, as the error is the smaller as n the exponent of the root is greater, it may be neglected when n is taken indefinitely great; and this being the case, we may conclude that either of these expressions,

$$nM(\sqrt[n]{y} - 1), \quad nM \left(1 - \frac{1}{\sqrt[n]{y}} \right)$$

is the accurate value of $\log. y$.

The best manner of applying the preceding formula is to take some power of the number 2 for n ; for by doing so, the root $\sqrt[n]{y}$ may be found by a repetition of extractions of the square root only. It was in this way that Briggs calculated the first logarithms; and he remarked, that if in performing the successive extractions of the square root, he at last obtained twice as many decimal places as there were ciphers after the decimal point, the integer before it being unity, then the decimal part of this root was exactly the half of that which went before; so that the decimal parts of the two roots were to each other in the same proportion as their logarithms: now this is an evident consequence of the preceding formula.

To give an example of the application of the formula, let it be required to find the numerical value of M , the modulus of the common system of logarithms, which, as it is the reciprocal of the Napierian logarithm of 10, is

$$\frac{1}{n} \times \frac{1}{\sqrt[n]{10} - 1} \text{ nearly,}$$

when n is some very great number. Let us suppose $n = 2^{60} = 8^{20}$; then, dividing unity by 8, and this result again by 8, and so on, we shall, after 20 divisions, have

$$\frac{1}{n} \text{ or } \frac{1}{8^{20}}, \text{ equal to}$$

$$0.00000000000000000000000086736173798840854.$$

Also, by extracting the square root of 10, and the square root of this result, and so on, after performing 60 extractions we shall find $\sqrt[n]{10}$ equal to

$$1.0000000000000000000000001971742081255052703251.$$

Therefore, $\frac{1}{n} \times \frac{1}{\sqrt[n]{10} - 1}$, or M is equal to

$$\frac{86736173798840854}{199717420812550527} = 0.4342944819.$$

As a second example, let it be required to find by the same formula the logarithm of 3, which is nearly

$$nM(\sqrt[n]{3} - 1) = \frac{n(\sqrt[n]{3} - 1)}{n(\sqrt[n]{10} - 1)} = \frac{\sqrt[n]{3} - 1}{\sqrt[n]{10} - 1},$$

n being as before a very great number. Let us suppose also in this case that $n = 2^{60}$; then after 60 extractions of the square root we have $\sqrt[n]{3}$ equal to

$$1.00000000000000000000000095289476407458932.$$

Construc- Therefore, taking the value of $\sqrt[n]{10}$ as found in last ex-
tion of Lo- ample, we have
garithms.

$$\log. 3 = \frac{\sqrt[n]{3} - 1}{\sqrt[n]{10} - 1} = \frac{95289426407458932}{199717420812550527} = .477121254719662.$$

This method of computing logarithms is evidently attended with great labour, on account of the number of extractions of roots which it requires to obtain a result true to a moderate number of places of figures. But the two series which we have given serve to simplify and complete it. For, whatever be the number y , it is only necessary to proceed with the extractions of the square root, till we have obtained for $\sqrt[n]{y}$ a value which is unity followed by a decimal fraction; and then $\sqrt[n]{y} - 1$ being a fraction, its powers will also be fractions so much the smaller as their exponents are greater; thus a certain number of terms of the series will express the logarithm to as many decimal places as may be required.

There are yet other artifices by which the series $\log. y = M \{ y - 1 - \frac{1}{2}(y-1)^2 + \frac{1}{3}(y-1)^3 - \frac{1}{4}(y-1)^4 + \&c. \}$ may be transformed into others which shall always converge, and in particular the following. Let $1 + u$ be substituted in the series for y ; then it becomes

$$\log. (1+u) = M \left(u - \frac{u^2}{2} + \frac{u^3}{3} - \frac{u^4}{4} + \frac{u^5}{5} - \&c. \right)$$

In like manner, if $1 - u$ be substituted for y , we have

$$\log. (1-u) = M \left(-u - \frac{u^2}{2} - \frac{u^3}{3} - \frac{u^4}{4} - \frac{u^5}{5} - \&c. \right)$$

Let the latter equation be subtracted from the former; and since $\log. (1+u) - \log. (1-u)$, is equal to $\log. \frac{1+u}{1-u}$; we shall have

$$\log. \frac{1+u}{1-u} = 2M \left\{ u + \frac{u^3}{3} + \frac{u^5}{5} + \frac{u^7}{7} + \&c. \right\},$$

which series, by substituting z for $\frac{1+u}{1-u}$, and consequently $\frac{z-1}{z+1}$ for u , will be otherwise expressed thus,

$$\log. z = 2M \left\{ \frac{z-1}{z+1} + \frac{1}{3} \left(\frac{z-1}{z+1} \right)^3 + \frac{1}{5} \left(\frac{z-1}{z+1} \right)^5 + \&c. \right\};$$

which is not only simple, but has also the property of converging in every case.

As an example of the utility of this formula, we shall employ it to compute the Napierian logarithm of 2, which will be

$$2 \left(\frac{1}{3} + \frac{1}{3 \cdot 3^3} + \frac{1}{5 \cdot 3^5} + \frac{1}{7 \cdot 3^7} + \frac{1}{9 \cdot 3^9} + \&c. \right) = A + \frac{1}{3}B + \frac{1}{5}C + \frac{1}{7}D + \frac{1}{9}E + \&c.$$

where A is put for $\frac{2}{3}$, B for $\frac{2}{3^3} = \frac{A}{9}$, C for $\frac{2}{3^5} = \frac{B}{9}$, D for $\frac{2}{3^7} = \frac{C}{9}$, &c. The calculation will be as follows:

$$\begin{array}{ll} A = & .666666666666 \\ B = \frac{1}{3} A = & .074074074074 \\ C = \frac{1}{5} B = & .008230452674 \\ D = \frac{1}{7} C = & .000914494742 \\ E = \frac{1}{9} D = & .000101610527 \\ F = \frac{1}{11} E = & .000011290059 \\ G = \frac{1}{13} F = & .000001254451 \\ H = \frac{1}{15} G = & .000000139383 \\ I = \frac{1}{17} H = & .000000015487 \\ K = \frac{1}{19} I = & .000000001721 \\ L = \frac{1}{21} K = & .000000000191 \\ M = \frac{1}{23} L = & .000000000021 \end{array}$$

$$\begin{array}{ll} A = & .666666666666 \\ \frac{1}{3} B = & .024691358025 \\ \frac{1}{5} C = & .001646090535 \\ \frac{1}{7} D = & .000130642106 \\ \frac{1}{9} E = & .000011290056 \\ \frac{1}{11} F = & .000001026369 \\ \frac{1}{13} G = & .000000096496 \\ \frac{1}{15} H = & .000000009292 \\ \frac{1}{17} I = & .000000000911 \\ \frac{1}{19} K = & .000000000091 \\ \frac{1}{21} L = & .000000000001 \end{array}$$

Construc-
tion of Lo-
garithms.

$$\text{Nap. log. } 2 = .693147180561$$

Thus, by a very easy calculation, we have obtained the Napierian logarithm of 2 true to the first ten places of figures; the accurate value, as far as the 12th place, being 0.693147180560.

If this very simple process, by which we have found the logarithm of 2 (the whole of which is here actually put down), be compared with the laborious calculations which must have been performed to have found the same logarithm by the method explained in the beginning of this section, the great superiority of this method to the other, and even to the second method, by which we found the value of M, and the logarithm of 3, must be very apparent.

In the same manner as we have found the logarithm of 2, we may find those of 3, 5, &c. In computing the logarithm of 3, the series would converge by the powers of the fraction $\frac{3-1}{3+1} = \frac{1}{2}$, and in computing the logarithm of 5 it

would converge by the powers of $\frac{5-1}{5+1} = \frac{2}{3}$; but in each

of these cases the series would converge slower, and of course the labour would be greater than in computing the logarithm of 2. And if the number whose logarithm was required was still more considerable; as, for example, 199, the series would converge so slow as to be useless.

We may however avoid this inconvenience by again transforming this last formula into another which shall express the logarithm of any number by means of a series, and a logarithm supposed to be previously known. To effect this new transformation, let $\frac{1+u}{1-u} = 1 + \frac{z}{n}$, and

consequently $u = \frac{z}{2n+z}$, these values being substituted in

the formula, $\log. \frac{1+u}{1-u} = 2M \left(u + \frac{u^3}{3} + \frac{u^5}{5} + \frac{u^7}{7} + \&c. \right)$

we have $\log. \left(1 + \frac{z}{n} \right)$ equal to

$$2M \left\{ \frac{z}{2n+z} + \frac{1}{3} \left(\frac{z}{2n+z} \right)^3 + \frac{1}{5} \left(\frac{z}{2n+z} \right)^5 + \&c. \right\}$$

but $\log. \left(1 + \frac{z}{n} \right) = \log. \frac{n+z}{n} = \log. (n+z) - \log. n$,

therefore, $\log. (n+z) = \log. n +$

$$2M \left\{ \frac{z}{2n+z} + \frac{1}{3} \left(\frac{z}{2n+z} \right)^3 + \frac{1}{5} \left(\frac{z}{2n+z} \right)^5 + \&c. \right\}$$

By the assistance of this formula, and the known properties of logarithms, we may proceed calculating the logarithm of one number from that of another as follows.

To find the Napierian logarithm of 3 from that of 2, already found. We have here $n = 2$, $z = 1$, and $\frac{z}{2n+z} = \frac{1}{3}$.

Therefore the logarithm of 3 is

$$\begin{aligned} \log. 2 + 2 \left(\frac{1}{3} + \frac{1}{3 \cdot 3^3} + \frac{1}{5 \cdot 3^5} + \frac{1}{7 \cdot 3^7} + \&c. \right) \\ = \log. 2 + A + \frac{1}{3}B + \frac{1}{5}C + \frac{1}{7}D + \frac{1}{9}E + \&c. \end{aligned}$$

Construction of Logarithms. where A is put for $\frac{1}{2}$, B for $\frac{1}{25}$, C for $\frac{1}{25}$, and so on.

The calculation may stand thus :

$$\begin{aligned} A &= \cdot 400000000000 \\ B = \frac{1}{25} A &= \cdot 016000000000 \\ C = \frac{1}{25} B &= \cdot 000640000000 \\ D = \frac{1}{25} C &= \cdot 000025600000 \\ E = \frac{1}{25} D &= \cdot 000001024000 \\ F = \frac{1}{25} E &= \cdot 000000040960 \\ G = \frac{1}{25} F &= \cdot 000000001638 \\ H = \frac{1}{25} G &= \cdot 000000000066 \end{aligned}$$

$$\begin{aligned} A &= \cdot 400000000000 \\ \frac{1}{2} B &= \cdot 005333333333 \\ \frac{1}{3} C &= \cdot 000128000000 \\ \frac{1}{4} D &= \cdot 000003657143 \\ \frac{1}{5} E &= \cdot 000000113778 \\ \frac{1}{6} F &= \cdot 000000003724 \\ \frac{1}{7} G &= \cdot 000000000126 \\ \frac{1}{8} H &= \cdot 000000000034 \end{aligned}$$

$$\begin{aligned} &\cdot 405465108108 \\ \text{Nap. log. 2} &= \cdot 693147180551 \end{aligned}$$

$$\text{Nap. log. 3} = 1\cdot 098612288659$$

This logarithm is true to 10 decimal places, the accurate value to 12 figures being 1·098612288668, which would have been our result had the correct value of log. 2, viz. ·693147180560 been employed.

The Napierian logarithm of 4 is immediately had from that of 2 by considering that as $4 = 2^2$, therefore $\log. 4 = \log. 2 + \log. 2$.

$$\text{Nap. log. 2} = \cdot 693147180551$$

$$\text{Nap. log. 4} = 1\cdot 386294361102$$

This is also true to 10 places besides the integer.

To find the Napierian logarithm of 5, from that of 4 ;

we have $n = 4$, $z = 1$, and $\frac{z}{2n+1} = \frac{1}{9}$, therefore the logarithm of 5 is expressed by

$$\log. 4 + 2 \left(\frac{1}{9} + \frac{1}{3 \cdot 9^3} + \frac{1}{5 \cdot 9^5} + \frac{1}{7 \cdot 9^7} + \&c. \right)$$

$$\log. 4 + A + \frac{1}{2} B + \frac{1}{3} C + \frac{1}{4} D + \&c.$$

where $A = \frac{1}{9}$, $B = \frac{1}{81} A$, $C = \frac{1}{81} B$, &c.

The calculation.

$$\begin{aligned} A &= \cdot 222222222222 \\ B = \frac{1}{81} A &= \cdot 002743484225 \\ C = \frac{1}{81} B &= \cdot 000033870176 \\ D = \frac{1}{81} C &= \cdot 000000418150 \\ E = \frac{1}{81} D &= \cdot 000000005162 \\ F = \frac{1}{81} E &= \cdot 000000000064 \end{aligned}$$

$$\begin{aligned} A &= \cdot 222222222222 \\ \frac{1}{2} B &= \cdot 000914494742 \\ \frac{1}{3} C &= \cdot 000006774035 \\ \frac{1}{4} D &= \cdot 000000059736 \\ \frac{1}{5} E &= \cdot 000000000574 \\ \frac{1}{6} F &= \cdot 000000000006 \end{aligned}$$

$$\begin{aligned} &\cdot 223143551315 \\ \text{Nap. log. 4} &= 1\cdot 386294361102 \end{aligned}$$

$$\text{Nap. log. 5} = 1\cdot 609437912417$$

This result is also correct to the first ten places.

The logarithm of 6 is found from those of 2 and 3, because $6 = 2 \times 3$, therefore $\log. 6 = \log. 2 + \log. 3$.

$$\begin{aligned} \text{Nap. log. 2} &= 0\cdot 693147180551 \\ \text{Nap. log. 3} &= 1\cdot 098612288659 \end{aligned}$$

$$\text{Nap. log. 6} = 1\cdot 791759469210$$

This result is correct as far as the tenth decimal place.

We might find the logarithm of 7 from that of 6, that is, from the logarithms of 3 and 2, in the same manner as we have found the logarithms of 5 and 3 ; but it may be more readily found from the logarithms of 2 and 5 thus.

$$\text{Because } \frac{2 \times 5^2}{7^2} = \frac{50}{49}, \text{ therefore } \log. 2 + 2 \log. 5 -$$

$$2 \log. 7 = \log. \frac{50}{49}, \text{ and consequently}$$

$$\log. 7 = \frac{1}{2} \log. 2 + \log. 5 - \frac{1}{2} \log. \frac{50}{49}.$$

Now the logarithm of $\frac{50}{49}$ may be readily obtained from

$$\log. z = 2M \left\{ \frac{z-1}{z+1} + \frac{1}{3} \left(\frac{z-1}{z+1} \right)^3 + \frac{1}{5} \left(\frac{z-1}{z+1} \right)^5 + \&c. \right\}$$

For, substituting $\frac{50}{49}$ for z , the formula gives

$$\begin{aligned} \text{Nap. log. } \frac{50}{49} &= 2 \left(\frac{1}{99} + \frac{1}{3 \cdot 99^3} + \frac{1}{5 \cdot 99^5} + \&c. \right) \\ &= A + \frac{1}{2} B + \frac{1}{3} C + \&c. \end{aligned}$$

where $A = \frac{2}{9 \cdot 11}$, $B = \frac{2}{9^3 \cdot 11^3}$, $C = \frac{2}{9^5 \cdot 11^5}$, &c. This series converges with great rapidity, and a few of its terms will be sufficient to give the logarithm of 7, as appears from the following operation.

$$A = \cdot 020202020202$$

$$B = \frac{1}{9^3 \cdot 11^3} A = \cdot 000002061220$$

$$C = \frac{1}{9^5 \cdot 11^5} B = \cdot 000000000210$$

$$A = \cdot 020202020202$$

$$\frac{1}{2} B = \cdot 000000687073$$

$$\frac{1}{3} C = \cdot 000000000042$$

$$\text{Nap. log. } \frac{50}{49} = \cdot 020202707317$$

$$\frac{1}{2} \log. 2 = 0\cdot 346573590275$$

$$\log. 5 = 1\cdot 609437912417$$

$$1\cdot 956011502692$$

$$\frac{1}{2} \log. \frac{50}{49} = 0\cdot 010101353658$$

$$\text{Nap. log. 7} = 1\cdot 945910149034$$

This logarithm, like those we found before, is correct in the first ten decimal places.

The logarithms of 8, 9, and 10 are immediately obtained from those of 2, 3, and 5, as follows :

$$\text{Nap. log. 2} = 0\cdot 693147180551$$

$$\text{Nap. log. 8} = 2\cdot 079441541653$$

$$\text{Nap. log. 3} = 1\cdot 098612288659$$

$$\text{Nap. log. 9} = 2\cdot 197224577318$$

$$\text{Nap. log. 2} = 0\cdot 693147180551$$

$$\text{Nap. log. 5} = 1\cdot 609437912417$$

$$\text{Nap. log. 10} = 2\cdot 302585092968$$

Construction of Logarithms.

Construction of Logarithms.

Thus by a few calculations we have found the Napierian logarithms of the first ten numbers, each true to ten decimal places; and since the Napierian logarithm of 10 is now known, the *modulus* of the common system, which is the reciprocal of that logarithm, will also be known, and will be

$$\frac{1}{2.302585092968} = .4342944819.$$

The common logarithms of the first ten numbers may now be found from the Napierian logarithms by multiplying each of the latter by the *modulus*, or dividing by its reciprocal, that is, by the Napierian logarithm of 10. And as the *modulus* of the common system is so important an element in the theory of logarithms, we shall give its value, together with that of its reciprocal, as far as the 30th decimal place.

$$M = .434294481903251827651128918916$$

$$\frac{1}{M} = 2.302585092994045684017991454684$$

The formulæ already given are sufficient for finding the logarithms of all numbers whatever throughout the table; but there are yet others which may often be applied with great advantage, and we shall now investigate some of these.

Because

$$\log. z = 2M \left\{ \frac{z-1}{z+1} + \frac{1}{3} \left(\frac{z-1}{z+1} \right)^3 + \frac{1}{5} \left(\frac{z-1}{z+1} \right)^5 + \&c. \right\}$$

If we now suppose

$$z = \frac{n^2}{n^2-1} = \frac{n^2}{(n-1)(n+1)},$$

so that $\frac{z-1}{z+1} = \frac{1}{2n^2-1}$, then the formula becomes

$$\log. \frac{n^2}{(n-1)(n+1)} = 2M \left\{ \frac{1}{2n^2-1} + \frac{1}{3} \left(\frac{1}{2n^2-1} \right)^3 + \frac{1}{5} \left(\frac{1}{2n^2-1} \right)^5 + \&c. \right\}$$

But $\log. \frac{n^2}{(n-1)(n+1)} = 2 \log. n - \log. (n-1) - \log. (n+1)$, therefore, putting N for the series

$$2M \left\{ \frac{1}{2n^2-1} + \frac{1}{3} \left(\frac{1}{2n^2-1} \right)^3 + \frac{1}{5} \left(\frac{1}{2n^2-1} \right)^5 + \&c. \right\}$$

we have this formula,

$2 \log. n - \log. (n-1) - \log. (n+1) = N$; and hence, as often as we have the logarithms of any two of three numbers whose common difference is unity, the logarithm of the remaining number may be found. Example: Given $\log. 9 = 0.95424250943$, $\log. 10 = 1$; to find the common logarithm of 11.

Here we have $n = 10$, so that the formula gives in this case $2 \log. 10 - \log. 9 - \log. 11 = N$, and hence we have

$$\log. 11 = 2 \log. 10 - \log. 9 - N,$$

$$\text{where } N = \frac{2M}{199} + \frac{2M}{3 \cdot 199^3} + \&c.$$

$$M \text{ being } .43429448190.$$

Calculation of N .

$$A = \frac{2M}{199} = .00436476866$$

$$B = \frac{A}{3 \cdot 199^2} = .00000003674$$

$$N = 0.00436480540$$

$$\log. 9 = 0.95424250943$$

$$\log. 9 + N = 0.95860731483$$

$$2 \log. 10 = 2.00000000000$$

$$\log. 11 = 1.04139268517$$

Here the series expressed by N converges very fast, so that two of its terms are sufficient to give the logarithm true to 10 places of decimals. But the logarithm of 11 may be expressed by the logarithms of smaller numbers, and a series which converges still more rapidly, by the following artifice, which will apply also to some other numbers. Because the numbers 98, 99, and 100 are the products of numbers, the greatest of which is 11, for $98 = 2 \times 7^2$, $99 = 9 \times 11$, and $100 = 10 \times 10$, it follows that if we have an equation composed of terms which are the logarithms of these three numbers, it may be resolved into another, the terms of which shall be the logarithms of the number 11 and other smaller numbers. Now by the preceding formula, if we put 99 for n , we have

$$2 \log. 99 - \log. 98 - \log. 100 = N,$$

that is, substituting $\log. 9 + \log. 11$ for $\log. 99$, $\log. 2 + 2 \log. 7$ for $\log. 98$, and $2 \log. 10$ for $\log. 100$,

$$2 \log. 9 + 2 \log. 11 - \log. 2 - 2 \log. 7 - 2 \log. 10 = N,$$

and hence by transposition, &c.

$$\log. 11 = \frac{1}{2} N + \frac{1}{2} \log. 2 + \log. 7 - \log. 9 + \log. 10;$$

and in this equation

$$N = \frac{2M}{19601} + \frac{1}{3} \frac{2M}{19601^3} + \&c.$$

The first term alone of this series is sufficient to give the logarithm of 11 true to 14 places.

Another formula, by which the logarithm of a number is expressed by the logarithms of other numbers and a series, may be found as follows.

Resuming the formula

$$\log. z = 2M \left\{ \frac{z-1}{z+1} + \frac{1}{3} \left(\frac{z-1}{z+1} \right)^3 + \frac{1}{5} \left(\frac{z-1}{z+1} \right)^5 + \&c. \right\}$$

$$\text{put } z = \frac{(n-1)^2(n+2)}{(n-2)(n+1)^2} = \frac{n^3-3n+2}{n^3-3n-2},$$

$$\text{then } \frac{z-1}{z+1} = \frac{2}{n^3-3n}.$$

Let these values of z , and $\frac{z-1}{z+1}$, be substituted in the

formula, and it becomes

$$\log. \frac{(n-1)^2(n+2)}{(n-2)(n+1)^2} = 2M \left\{ \frac{2}{n^3-3n} + \frac{1}{3} \left(\frac{2}{n^3-3n} \right)^3 + \&c. \right\}$$

But the quantity on the left-hand side of this equation is manifestly equal to $2 \log. (n-1) + \log. (n+2) - \log. (n-2) - 2 \log. (n+1)$; therefore, putting P for the series,

$$2M \left\{ \frac{2}{n^3-3n} + \frac{1}{3} \left(\frac{2}{n^3-3n} \right)^3 + \frac{1}{5} \left(\frac{2}{n^3-3n} \right)^5 + \&c. \right\}$$

we have this formula,

$$\log. (n+2) + 2 \log. (n-1) - \log. (n-2) - 2 \log. (n+1) = P.$$

By this formula we may find, with great facility, the logarithm of any one of the four numbers $n-2$, $n-1$, $n+1$, $n+2$, having the logarithms of the other three. We may also employ it in the calculation of logarithms, as in the following example. Let the numbers 5, 6, 7, 8, be substituted successively in the formula; then, observing that $\log. 6 = \log. 2 + \log. 3$, and $\log. 8 = 3 \log. 2$, we have these four equations,

$$\log. 7 + 2 \log. 2 - 3 \log. 3 = \frac{2M}{55} + \frac{2M}{3 \cdot 55^3} + \&c.$$

$$-2 \log. 7 + \log. 2 + 2 \log. 5 = \frac{2M}{99} + \frac{2M}{3 \cdot 99^3} + \&c.$$

$$4 \log. 3 - 4 \log. 2 - \log. 5 = \frac{2M}{161} + \frac{2M}{3 \cdot 161^3} + \&c.$$

$$\log. 5 - 5 \log. 3 + 2 \log. 7 = \frac{2M}{244} + \frac{2M}{3 \cdot 244^3} + \&c.$$

Let $\log. 2$, $\log. 3$, $\log. 5$, and $\log. 7$, be now considered as

Construction of Logarithms. four unknown quantities, and by resolving those equations in the usual manner, the logarithms may be determined. Resuming once more the formula

$$\log. z = 2M \left\{ \frac{z-1}{z+1} + \frac{1}{3} \left(\frac{z-1}{z+1} \right)^3 + \&c. \right\}$$

let $\frac{n^2(n+5)(n-5)}{(n+3)(n-3)(n+4)(n-4)}$ be substituted in it

instead of z , then, by this substitution, $\frac{z-1}{z+1}$ will become

$$\frac{-72}{n^4-25n^2+72}, \text{ and the formula will be transformed to}$$

$$\log. \frac{n^2(n+5)(n-5)}{(n+3)(n-3)(n+4)(n-4)} = -2M \left\{ \frac{72}{n^4-25n^2+72} + \frac{1}{3} \left(\frac{72}{n^4-25n^2+72} \right)^3 + \&c. \right\}$$

Hence, putting the latter side of this equation equal to Q , we have this formula,

$$2 \log. n + \log. (n+5) + \log. (n-5) - \log. (n+3) - \log. (n-3) - \log. (n+4) - \log. (n-4) + Q = 0$$

which may be applied in the calculation of logarithms in the same manner as the former.

But when it is required to find the logarithm of a higher number, as, for example, 1231, we may proceed as follows.

$$\begin{aligned} \log. 1231 &= \log. (1230 + 1) = \log. \left\{ 1230 \left(1 + \frac{1}{1230} \right) \right\} \\ &= \log. 1230 + \log. \left(1 + \frac{1}{1230} \right). \end{aligned}$$

Again, $\log. 1230 = \log. 2 + \log. 5 + \log. 123$, and $\log.$

$$123 = \log. \left\{ 120 \left(1 + \frac{1}{40} \right) \right\} = \log. 120 + \log. \left(1 + \frac{1}{40} \right),$$

$\log. 120 = \log. (2^3 \times 3 \times 5) = 3 \log. 2 + \log. 3 + \log. 5$. Therefore $\log. 1231 = 4 \log. 2 + \log. 3 + 2 \log. 5 +$

$$\log. \left(1 + \frac{1}{40} \right) + \log. \left(1 + \frac{1}{1230} \right)$$

Thus the logarithm of the proposed number is expressed by the logarithms of 2, 3, 5, and the logarithms of

$1 + \frac{1}{40}$, $1 + \frac{1}{1230}$, all of which may be easily found by the formulæ already delivered.

Trigonometrical canon.

III.—NATURE AND CALCULATION OF SINES, TANGENTS, &c.

The trigonometrical formulæ given in the *Arithmetic of Sines* (See ALGEBRA) contain the principles requisite for constructing tables in which the lengths of the sines, cosines, tangents, cotangents, secants, and cosecants of given angles, are exhibited for every degree, minute, and second of space of the quadrant. Such tables are known as *Trigonometrical Canons*. It is evident that such tables, when accurately computed, are invaluable, and will prevent the labour and trouble of calculating afresh, on every new occasion, the sine, cosine, &c., of any angle that may be required.

Trigonometrical Canons are generally calculated to a radius unity, or 1; but when this is the case, all the results are multiplied by 10,000, or any high power of 10, in order to avoid printing cyphers to the immediate right of the decimal point of the sines of all small angles.

Since the length of the semi-circumference of a circle has been approximated to, and found to be $\pi = 3.1415926535897932$ when radius = 1; and since the number of degrees in the semi-perimeter is $180^\circ = 10800'$; hence $1'$ of space = $1'$ of an arc = 0.000290888204 . Now,

since the small angle of $1'$ is subtended by an arc of the same magnitude, the sine of $1'$ will also be a small quantity, and may be regarded as equal to the arc. Thus the sine $1' =$ length of an arc of $1' = 0.000290888204$. In this manner the sine of $1'$ may be determined, but more legitimately from the formula of $\cos 2A = 2 \cos^2 A - 1$.

$\therefore \cos A = \sqrt{\frac{1}{2}(1 + \cos 2A)}$, when A not $> 90^\circ$; and since this is true whatever the angle A be, it is true when for A we write $\frac{A}{2}$. Hence,

$$\cos \frac{A}{2} = \sqrt{\frac{1}{2}(1 + \cos A)}; \cos \frac{A}{2^2} = \sqrt{\frac{1}{2}\left(1 + \cos \frac{A}{2}\right)};$$

$$\cos \frac{A}{2^3} = \sqrt{\frac{1}{2}\left(1 + \cos \frac{A}{2^2}\right)}; \cos \frac{A}{2^4} = \sqrt{\frac{1}{2}\left(1 + \cos \frac{A}{2^3}\right)};$$

$$\&c. = \&c. \quad \&c. = \&c.$$

$$\cos \frac{A}{2^{11}} = \sqrt{\frac{1}{2}\left(1 + \cos \frac{A}{2^{10}}\right)}$$

Let A receive a particular value, as 30° ; then $\cos 2A = \cos 60^\circ = \frac{1}{2}$. Wherefore,

$$\cos 30^\circ = \sqrt{\frac{1}{2}(1 + \cos 60^\circ)} = \sqrt{\frac{1}{2}\left(1 + \frac{1}{2}\right)} = \frac{\sqrt{3}}{2}$$

$$= 0.8660254;$$

$$\begin{aligned} \cos 15^\circ &= \sqrt{\frac{1}{2}(1 + \cos 30^\circ)} = \sqrt{\frac{1}{2}(1 + 0.8660254)} \\ &= 0.9659258; \end{aligned}$$

$$\begin{aligned} \cos 7^\circ 30' &= \sqrt{\frac{1}{2}(1 + \cos 15^\circ)} = \sqrt{\frac{1}{2}(1 + 0.9659258)} \\ &= 0.9914449; \end{aligned}$$

$$\&c. = \&c. \quad = \quad \&c.$$

If now we proceed in this manner and compute eleven bisections of the angle 30° ; that is, $\frac{30^\circ}{2^{11}}$, we shall at last

$$\text{come to } \cos \frac{30^\circ}{2^{11}} = \sqrt{\frac{1}{2}\left(1 + \cos \frac{30^\circ}{2^{10}}\right)}, \text{ or}$$

$$\cos \frac{30 \times 60 \times 1'}{2^{11}} = \cos \frac{225}{256} \times 1' = \cos 52''.734375;$$

$\therefore \cos 52''.734375 = 0.99999996782$, which is a very little greater than the cosine of $1'$;

$$\begin{aligned} \therefore \sin \frac{30^\circ}{2^{11}} &= \sin 52''.734375 = \sqrt{1 - \cos^2 \frac{30^\circ}{2^{11}}} \\ &= 0.000255663462. \end{aligned}$$

But the sines of very small angles increasing and decreasing as the angles themselves, that is, as the number of minutes they contain,

$$\therefore \sin 1' : \sin \frac{30^\circ}{2^{11}} = 1' : \frac{30^\circ}{2^{11}} = 1' : \frac{30 \times 60 \times 1'}{2^{11}}$$

$$= 1' : \frac{225}{256} = 1 : 0.000290888204$$

$$\therefore \sin 1' = 0.000290888204.$$

$$\begin{aligned} \text{So also } \cos 1' &= \sqrt{1 - \sin^2 1'} = \sqrt{1 - (0.000290888204)^2} \\ &= 0.9999999577. \end{aligned}$$

If $\sin 30'$ be determined from the formula,

$$\sin A = \frac{1}{2} \{ \sqrt{1 + \sin 2A} - \sqrt{1 - \sin 2A} \}, \text{ we have}$$

$$\sin 30' = \frac{1}{2} \{ \sqrt{1 + \sin 1'} - \sqrt{1 - \sin 1'} \}$$

$= 0.000145199$, which is very nearly equal to half the sine of $1'$, since the angle is small;

$$\begin{aligned} \therefore \cos 30'' &= \sqrt{1 - \cos^2 30'} = \sqrt{1 - (0.000145199)^2} \\ &= 0.9999999896. \end{aligned}$$

Since the sine and cosine of $1'$ and $30''$ are known, the sines and cosines of all angles from $1'$ or $30''$ up to 90° , differing from one another by $1'$ or $30''$, can easily be determined. This is effected by the convenient formulæ of

$$\begin{aligned} \sin nA &= 2 \sin (n-1)A \cdot \cos A - \sin (n-2)A, \text{ and} \\ \cos nA &= 2 \cos (n-1)A \cdot \cos A - \cos (n-2)A, \end{aligned}$$

in which, make $A = 1'$, and for n write successively the natural numbers 2, 3, &c., and

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$$\begin{aligned}\sin 2' &= 2 \sin 1' \cdot \cos 1' - \sin 0' = 0.0005817764 \\ \sin 3' &= 2 \sin 2' \cdot \cos 1' - \sin 1' = 0.0008726645 \\ \sin 4' &= 2 \sin 3' \cdot \cos 1' - \sin 2' = 0.0011635526 \\ &\&c. = \&c. = \&c. \\ \cos 2' &= 2 \cos 1' \cdot \cos 1' - \cos 0' = 0.9999998308 \\ \cos 3' &= 2 \cos 2' \cdot \cos 1' - \cos 1' = 0.9999996192 \\ \cos 4' &= 2 \cos 3' \cdot \cos 1' - \cos 2' = 0.9999993231 \\ &\&c. = \&c. = \&c.\end{aligned}$$

Now it would be very inconvenient to register so many cyphers which necessarily enter the values of the sines of small angles; therefore, in order to avoid this, the sines, cosines, and the quantities which are derived from them, are multiplied by 10,000, or a suitable power of 10; that is, the decimal point is removed four or more places to the right, previous to their being registered in the tables. If the *real* values of the sines, cosines, and the other quantities dependent thereon, be tabulated, without being multiplied by any power of 10, the tables are known as *Tables of Natural Sines, Cosines, Tangents, &c.*

In this manner, therefore, we can easily derive from the preceding results the sines and cosines of all angles from 1' to 90°.

The same quantities may also be obtained from the formula $\sin(A+B) + \sin(A-B) = 2 \sin A \cos B$, which may be thrown into the form of

$$\sin(A+B) = \sin A + \{\sin A - \sin(A-B)\} - \sin A \left(2 \sin \frac{B}{2}\right)^2;$$

so that if $B = 1'$, and if for A we write successively 1', 2', 3', &c., we have, *e.g.* when $A = 1'$, and $B = 1'$, $\sin 2' = \sin 1' + (\sin 1' - \sin 0') - \sin 1' \cdot (2 \sin 30'')^2$.

In either case, we shall have a long multiplication to perform, but the same result.

But we need not proceed in these calculations beyond the sine and cosine of 45°, for the same values will recur from 45° to 90°. The reason of this is because $\sin(45^\circ + A)$

$$= \cos(90^\circ - (45^\circ + A)) = \cos(45^\circ - A); \text{ and also}$$

$$\cos(45^\circ + A) = \sin(90^\circ - (45^\circ + A)) = \sin(45^\circ - A).$$

Hence a trigonometrical canon of sines and cosines is completed at 45°.

When, however, the sines and cosines have been computed from 1' up to 30°, the labour and risk of error in finding long products may be much diminished, by determining the value of the sine or cosine by addition and subtraction. Thus, we have

$$2 \sin A \cdot \cos B = \sin(A+B) + \sin(A-B), \text{ and}$$

$$2 \sin A \cdot \sin B = \cos(A-B) - \cos(A+B).$$

$$\text{Let } A = 30^\circ, \text{ then } 2 \sin A = 2 \sin 30^\circ = 1;$$

$$\therefore \cos B = \sin(30^\circ + B) + \sin(30^\circ - B) \text{ (i.), and}$$

$$\sin B = \cos(30^\circ - B) - \cos(30^\circ + B) \text{ (ii.).}$$

In these expressions, let B increase by 1' at a time, from 0° up to 30°, and we shall have all sines and cosines from 30° up to 60°: for

$$\sin 30^\circ 1' = \cos 1' - \sin 29^\circ 59'$$

$$\sin 30^\circ 2' = \cos 2' - \sin 29^\circ 58'$$

$$\&c. = \&c.$$

$$\cos 30^\circ 1' = \cos 29^\circ 59' - \sin 1'$$

$$\cos 30^\circ 2' = \cos 29^\circ 58' - \sin 2'$$

$$\&c. = \&c.$$

Again, in order to derive the sines and cosines of all angles from 60° up to 90°, we have

$$2 \cos A \cdot \sin B = \sin(A+B) - \sin(A-B), \text{ and,}$$

$$2 \cos A \cdot \cos B = \cos(A+B) + \cos(A-B).$$

$$\text{Let } A = 60^\circ, \text{ then } 2 \cos A = 2 \cos 60^\circ = 1;$$

$$\therefore \sin B = \sin(60^\circ + B) - \sin(60^\circ - B), \text{ (iii.), and}$$

$$\cos B = \cos(60^\circ + B) + \cos(60^\circ - B), \text{ (iv.).}$$

Give B all values from 0° up to 30°, the increase being by 1' at a time;

$$\therefore \sin 60^\circ 1' = \sin 1' + \sin 59^\circ 59'$$

$$\sin 60^\circ 2' = \sin 2' + \sin 59^\circ 58',$$

$$\&c. = \&c.$$

$$\cos 60^\circ 1' = \cos 1' - \cos 59^\circ 59'$$

$$\cos 60^\circ 2' = \cos 2' - \cos 59^\circ 58'$$

$$\&c. = \&c.$$

Trigonometrical Canon.

When the sines and cosines of all angles from 0° up to 90° have been computed, they form the basis for calculating the tangents and cotangents, the secants and cosecants, of

all angles from 0° up to 90°. For $\tan A = \frac{\sin A}{\cos A}$; $\cot A =$

$$\frac{\cos A}{\sin A} = \frac{1}{\tan A}; \sec A = \frac{1}{\cos A}; \operatorname{cosec} A = \frac{1}{\sin A}.$$

But if we suppose that the tangents of all angles from 0° up to 45° have been already tabulated, those from 45° up to 90° may be obtained very simply from the formula

$$2 \tan 2A = \tan(45^\circ + A) + \tan(45^\circ - A).$$

Let now A receive increments of 1' at a time;

$$\therefore \tan 45^\circ 1' = 2 \tan 2' + \tan 44^\circ 59'$$

$$\tan 45^\circ 2' = 2 \tan 4' + \tan 44^\circ 58'$$

$$\tan 45^\circ 3' = 2 \tan 6' + \tan 44^\circ 57',$$

$$\&c. = \&c.$$

The tangents of all angles being known, the cotangents are deduced therefrom; and although the sines and cosines will enable us to find the cosecants and secants respectively, yet the same quantities will be found much more simply by the following formulæ:—

$$2 \sec A = \tan\left(45^\circ + \frac{A}{2}\right) + \cot\left(45^\circ + \frac{A}{2}\right) \text{ and}$$

$$2 \operatorname{cosec} A = \tan \frac{A}{2} + \cot \frac{A}{2}.$$

Let A increase by 1' at a time, then, on $\sec A$ and $\operatorname{cosec} A$ becoming $\sec 45^\circ$, and $\operatorname{cosec} 45^\circ$, we shall have the one the complement of the other, since $\sec A = \operatorname{cosec}(90^\circ - A)$;

$$\therefore \sec 1' = \frac{1}{2} (\tan 45^\circ 0' 30'' + \cot 45^\circ 0' 30'')$$

$$\sec 2' = \frac{1}{2} (\tan 45^\circ 1' + \cot 45^\circ 1')$$

$$\sec 3' = \frac{1}{2} (\tan 45^\circ 1' 30'' + \cot 45^\circ 1' 30'')$$

$$\&c. = \&c.$$

$$\operatorname{cosec} 1' = \frac{1}{2} (\tan 30'' + \cot 30'')$$

$$\operatorname{cosec} 2' = \frac{1}{2} (\tan 1' + \cot 1')$$

$$\operatorname{cosec} 3' = \frac{1}{2} (\tan 1' 30'' + \cot 1' 30'')$$

$$\&c. = \&c.$$

We have already seen, that with respect to the sines and cosines, the tabulated results need be carried no further than 45°; the same may be said of the other elements which have been mentioned. For $\tan A = \cot(90^\circ - A)$; $\sec A = \operatorname{cosec}(90^\circ - A)$. Hence, at the top of trigonometrical tables the angles increase forwards from 0° to 45°, while at the bottom they proceed backwards from 45° to 90°.

In the construction of these trigonometrical canons, however, it is absolutely necessary to have formulæ of *verification*, or checks to verify, or rather to examine, the accuracy of the results as they progress from 0° up to 45°; for an error in one result is communicated to each quantity.

These formulæ of verification are, besides I. II. III. IV. :—
 $\cos(36^\circ + A) - \cos(72^\circ - A) + \cos(36^\circ - A) - \cos(72^\circ + A) = \cos A$;
 $\sin A + \sin(36^\circ - A) + \sin(72^\circ + A) = \sin(36^\circ + A) + \sin(72^\circ - A)$;
 $\sin(54^\circ + A) + \sin(54^\circ - A) - \sin(18^\circ + A) - \sin(18^\circ - A) = \cos A$.
 $\&c. \quad \&c.$

Suppose now that the sines, cosines, &c., of all angles have been calculated, radius being unity, and that we multiply each natural sine, cosine, &c., by 10,000,000,000 = 10^{10} , the logarithm of which is 10, then if of each of these new values we take the logarithm, and register such values in tables, we shall have a *logarithmic canon* of sines, cosines, &c.; and, therefore, the logarithms of the sines instead of the sines themselves. These logarithmic sines, &c., are found to be much more convenient in calculation than the natural sines, which are hence omitted in logarithmic tables. The *real* logarithm is found by subtracting 10 from the characteristics of the tabulated logarithms.

L O G I C.

I N T R O D U C T I O N.

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CHAPTER I.

The Psychological Data of Logic.

The rela-
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tween logic
and psy-
chology.

1. Logic is the theory of inference. Round this assertion circulate all endeavours towards precise definition of the science. Its function would thus be very incompletely described, if we were to refuse including, under the name of inference, any processes of thought having data narrower than those of the Syllogism. But we ought to comprehend, within the sphere of inference, all processes wherein a truth, involved in a thought or thoughts given as antecedent, is evolved in a thought which is found as consequent. On this understanding of the term, the Laws of Inference may rightly be said to be those which it is the function of Logic to develop into a system.

Logic, as being thus a systematic development of certain mental laws, takes its place among the sciences constituting the Philosophy of Mind. It is one of those derivative sciences, which branch off on all sides from Psychology, the one original and central science of the cycle.

The data which it has imperatively to demand from psychology are, doubtless, both fewer and nearer to the surface, than those which are required by any other science standing in the same predicament. They are so few, and so intimately related to each other, that in one page of the great psychological volume we read them all: they are so simple and obvious, that psychological controversies raise questions only as to the way of naming them, and leave the facts themselves quite untouched. They might be, and very often are, taken for granted without reference to the science which is their real source; and the borrowing is still further disguised when they are merely, one after another, brought to light as they are needed for use.

But there are more reasons than one for treating them differently.

The chief reason is this. The laws of thought which logic develops are necessary and universal. Therefore we are, especially if we aim at studying the science with scientific precision, in danger of forgetting that its truths, though not measured by experience, become known to us only through experience, that is, in the actual exercise of thought; that those forms of thought, to which all logical laws are relative, are themselves actually conditioned, and conditioned from without as well as from within; and that, if the laws are to have practical applicability as regulative canons of knowledge, their foundation must be firmly laid among the actualities of mental manifestation. The dependence of logic on psychology must be broadly asserted, in the way of protest against systems which seek to divorce it from experience.

Again, the province of logic cannot be clearly distinguished, unless its data have been expressly separated from the uses to which it puts them. It must assume Apprehension and Judgment, as the Forms of those thoughts which are the constitutive factors of inference: it must assume the Laws, both subjective and objective, by which Apprehension and Judgment are universally governed. Its duty is the development of those laws as bearing on those forms.

Lastly, however readily the data of our science might be admitted if presented in a loose and unscientific shape, it is by psychology that they have been systematized, justified, and designated. They are not available for precise and exhaustive use, unless they are laid down and named with

the utmost exactness which psychological analysis has made it possible to attain.

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2. It may be desirable to begin our hasty psychological survey, by explicitly setting aside those classes of mental phenomena whose laws are not logical.

When the phenomena of consciousness are considered subjectively, or purely as functions of the conscious mind, they seem to be naturally distributable into four Primary Modes. With three of these logic is in no way concerned. It does not deal with Feeling (or cognition without distinct evolution of the objects), in either of its objective varieties of sensation and emotion; nor with Wishing or Appetency, either as desire or as aversion; nor with Volition, the consequent of wishing, as that is of cognition. Its sphere lies wholly within the fourth of the modes; that is, among the facts which are describable as Thinking or Cognition, pure and proper: in other words, it lies among the phenomena which only are strictly describable, in the current phrase, as operations of Intellect or Understanding.

Nor is it as to all of these that logic requires to assume anything. It ignores, especially, one of the two great divisions into which, through differences in the character of cognizable objects, all human thought or knowledge is distributable. We know or think of an object, either directly, or through another object which represents it. Knowledge of the former kind has been called Immediate, Intuitive, or Presentative; that of the latter kind, Mediate or Representative. All objects that are cognizable immediately, may also be known mediately or representatively; but by far the most valuable part of our knowledge has objects which are cognizable mediately and not otherwise.

It is only with facts of mediate knowledge that logic can deal. It is when, and only when, reproduced from the past in present facts of thought, that immediate cognitions or their objects are susceptible of analysis or evolution. Consequently, these yield materials open to logical scrutiny, when, but only when, they are so reproduced; while, further, there is exposed to such scrutiny the whole gigantic mass of those complex cognitions, whose prominent elements are objects mediately known, and in which immediate cognition supplies only, as it always must, elements which are implicitly and obscurely assumed.

3. From the field of logic there are thus shut out all those mental facts, which are not contained in the sphere of mediate thinking. Within that sphere, the field of the science receives still another limitation. The only matter with which it deals is that which the schoolmen called Discourse or Discursive Thought.

The name hints at the character of the thing. Discursive thinking is a passing from thought to thought. Logic evolves, not laws which govern any one fact of mediate thinking taken singly, but relations between two or more such facts, or laws which govern the derivation of one such fact from another or others. That which logic scrutinizes is not one fact of thought, but a process constituted by a plurality of such facts. It considers Thinking as Knowledge or Cognition, that is, as having objects which are truths; but it assumes and systematizes those laws only in virtue of which, one or more facts of knowledge being given, other facts of knowledge may be elicited from them. The logical question is not, whether a given judgment or assertion is true or false. It is only whether, in virtue of certain

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laws of thought, there does or does not subsist, between two or more judgments or assertions, the correlation of antecedent and consequent; whether, one or more of the assertions being admitted, another must be admitted, or must be denied, or may be either denied or admitted. In short, the processes whose laws the science digests, possess always the essential characteristics of inference; and they are always, also, reducible into a form to which that name is directly and properly applicable.

Psychologically or subjectively considered, discursive thought exhibits no distinctive characteristics beyond those which belong to it as being necessarily mediate or representative. It is always resolvable into a series of judgments. Its peculiarity lies in the relation between the constitutive judgments: it is a relation in which the objective side is the more prominent of the two. We might say, indeed, that the relation subsists, not between the acts of judging, but between the judgments; not between one mental fact and another, but between their several results or products. The ideas which are the factors of each judgment must represent objects which, if not real, are at least thinkable: each judgment is given to logic in that aspect. It is only after having been so viewed, that the judgment is, as it were, turned round, to be examined from the opposite, the subjective side. A certain relation between thinkable objects being assumed in the antecedent judgment or judgments, the Laws of Thought compel us to think another relation between thinkable objects in the judgment which is the consequent.¹

Mediate
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4. All the laws of discursive thought bear on certain Forms, in which, and in which only, the facts of mediate thinking which constitute the process are possible.

Mediate thinking must always take the one or the other of two forms; forms whose difference is as truly subjective or formal as those which mark the four primary modes of consciousness. It must be either a fact of Apprehension or a fact of Judgment; species recognised most readily through the test of expression as brought to light by logical analysis. Every fact of thought expressible by a Term (that is, by a word or words interpretable as the name of an object or objects), is formally a fact of apprehension. Every fact of thought expressible by a Proposition or Asser-

¹ In the nomenclature of the German schools, the name Thinking or Thought is confined (at widest) to Thought Discursive. The same limitation has of late come into use among us. It is adopted by Sir William Hamilton, who acknowledges only this meaning of the word, and that other in which it covers all kinds of mental phenomena. "Thought and Thinking are used in a more and in a less restricted signification. In the former meaning, they are limited to the discursive energies alone; in the latter, they are co-extensive with consciousness." (*Edition of Reid*, p. 222). In this view, perception, whether external or internal, is not thinking in the narrow sense of the term; neither is imagination, whether it be simply reproductive, on the one hand, or creative or synthetic on the other.

In the text, the word Thinking is used as synonymous with Intellect or Intelligence. In the psychological scheme which was hinted at in the last section, Thinking, Intelligence, Cognition, is regarded as distributable into modes or kinds on each of two principles. Considered subjectively or formally, it must take place in the one or the other of the two forms which are called Apprehension and Judgment. Considered objectively, that is, as modified by the character of the objects known or thought of, thinking falls, first, into the two genera of Immediate and Mediate. Immediate thinking is of two species, Self-Consciousness and Consciousness Perceptive (perception, internal and external); facts of both kinds being indeed actually complex, and especially having Feeling as an element, but both being susceptible of being regarded abstractively as facts of pure and proper thinking or cognition. Mediate thinking embraces two species; first, Imagination proper, that is, the thinking of individual objects not present (which, again, may be either simply reproductive or synthetic); and, secondly, Conception proper, or the thinking of universals. Both Imagination and Conception take spontaneously the form of Apprehension; but both, besides presupposing Judgments, yield matter for new Judgments, which are necessarily Mediate.

tion or Predication, is formally a fact of judgment. Every thinkable object, or group of objects, no matter how complex our thought of it may be, is denotable by a term, if only we have words adequate to express all the elements which we think of it as involving. Every act of thought in which we explicate a relation, is denotable by a proposition, and requires the propositional form.

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5. (1.) The first formal determination of Judgment is The formal one which, as we shall find, lies at the very root of all logic-character-ical doctrine. A judgment, or the proposition which expresses it, must always be either Affirmative or Negative: a judgment which should be neither the one nor the other is utterly inconceivable: there is no medium between affirmation and negation.

(2.) Every judgment, further, is formally resolvable into the affirmation or denial of a Relation; and relation implies plurality of ideas or objects related. We shall immediately, it is true, encounter a class of cases in which there is not really such a plurality; and the possibility of these will at once prescribe a limit to logical analysis, and serve as a point of departure for the development of judgments really founded on relation. In the mean time, it must be noted that the formally relative character of all judgments, impressing itself necessarily on the propositions by which all judgments must be expressed, makes it possible, while for exact logical scrutiny it is necessary, to dissect all propositions into three factors or constitutive elements. They are these: the two Terms (Subject and Predicate), which are names of the ideas or objects correlated; and the Copula, in which the relation is asserted. The subject denotes that which is the datum or antecedent of the judgment, that which is given to be determined by the other term. The predicate denotes that which is the quæsitum or consequent, that by which the subject is determined. The copula asserts the relation, but it asserts nothing more; and, that we may make the closest possible approach to a pure affirmation or denial, it must always, for strict logical use, be either "is" or "is not," "are" or "are not." It might be said, that the terms are the objective factors of a proposition, and that the copula is its subjective factor.

(3.) There emerges thus, as necessary to be assumed in all further steps, the doctrine of that which logicians call the *Quality* of propositions. Judgments and propositions must be either *Affirmative* or *Negative*; and the quality of a given proposition is signified by its copula.

6. The formal theory of judgment, in itself exceedingly simple, becomes perplexingly complicated through the complexity inseparable from the theory of apprehension.

Apprehension, as the name is here understood, is the Simple Apprehension of the logicians; that is, mere apprehension not evolved into judgment. We give the fact that name, when we desire to describe it by reference to the thinking subject, or as a mental act or phenomenon: when we desire to describe it as representative of an object or objects, it may be, and is, called an Idea or Notion. The idea or notion is that which is directly denoted in language by a Term; and a term is thus, mediately, the name of an object or objects. The names apprehension and idea denote one and the same fact; but they denote it as regarded from two opposite points of view, from either of which it may be contemplated, but not from both at once.

The differences between objects apprehensible, must modify variously the character of the ideas and terms through which they are thought. But, of all such differences, there is only one which modifies the form of apprehension necessarily and always, and which, therefore, possesses a peremptory logical value. It is the difference between the Individual and the Universal. This difference yields two varieties of apprehension; namely, Imagination and Conception. We

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apprehend the individual in imagination, which, objectively viewed, gives an Image: we apprehend the universal in conception, which, objectively viewed, gives a Concept. The image is expressed in words by a Singular Term; the concept by a Common or Generic Term.

The Singular Term is a name for an object thought as having unity, or as being one object. Its unity or individuality may be constituted by parts, each of which might in its turn be thought as one; but it is thought under some relation yielding a unity, which cannot be thought away until some other relation is substituted for the first. "Aristotle," "John Milton," "This man," are not more distinctly singular terms, than are these: "The course of conduct to be adopted," "The (individual) series of fancies which lately floated through my mind." "Yonder forest" is a singular term; so are "That tree of yonder forest," "The gnarled bough of that tree."

The Common Term is the Name of a Class, a name for a plurality of objects, a name applicable to any or all of them in respect of a certain relation between them. Its meaning as a name of objects is not exhausted unless it is applied to all; as "All poets," "All the trees in the wood:" but, continuing to think of the objects under the same relation, we may apply it to some, or to any number of objects fewer than all, as "Some poets," "Most of the trees in the wood."

One feature of contrast should here be noted, as having a wide logical applicability. Apprehension may be either Direct or Symbolic. Imagination is a direct apprehension: if we think of an individual object through a name, we think symbolically; but it is not necessary we should so think of such an object. A person remembered is thought of directly when we call up his image, the representation of his appearance. Contrariwise (and this is the point to be noted), conception is necessarily symbolic. That which is signified by a common term, cannot be represented in thought otherwise than through a symbol; and words, if not the only possible symbols, are the only ones that are fully adequate for the purpose. Why the case should so stand, is a question very abstruse, and not logical. But some of the reasons may come to light when we have examined the common term a little more closely, and have discovered that it represents, not anything actually known before, but a complex thought which has resulted from a comparison of known objects. In the meantime it should be remembered that, in a certain view, "concept" and "common term" mean one and the same thing; that, at the very least, the thought which we call a concept is not only not expressible, but not even thinkable, unless through the common term.

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7. The signification of the common term is double. It is a name both of substance and of attribute: it is a name both of objects possessing an attribute, and of an attribute possessed by objects.

Most obviously it is, as it was already described, the name of a class, of a plurality of objects. But it is a name of these as thought under a relation; and that relation is, their possession of a common attribute. It is, indeed, applicable to all and each of the objects, just because, and in so far as, they are thought as possessing a certain attribute, or a combination of attributes, which combination is usually thinkable as one attribute more or less complex.

If we attempt to trace hypothetically the formation of a common term, we shall find that the discovery of the attribute must have preceded the imposition of the name.

One of the conditions under which only we can think of objects, is that of Number, which develops itself in the phases of unity, plurality, and totality. If our given objects are more than one, our contemplation of them is obscure and unsatisfactory: we constantly strive in thought to attain unity. But, an individual and simple unity being here unattainable, we endeavour at least to gain a com-

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plex unity, that is, a totality constituted by parts. We endeavour to think of our plurality of objects in a relation in which they are such constitutive parts. But such a relation must be that of resemblance: it must lie in the fact, ascertained by us, or for us, through observation, that each of the objects possesses a certain attribute or property. The common term, borrowed or invented, will then enable us to think of our objects as being "all," but only as being "all" in respect of their possession of the common attribute.

Now, this two-fold relation of the common term is the most fruitful of all logical data. Therefore we had better seize, at once, names by which both of its members may be technically described. The objective relation of the term, its signification as being a name of objects, will be called its *Extension*: its attributive relation, its signification as a name of attribute, will be called its *Comprehension*. The common term "man" has extension, as being a name for all and each of the persons constituting the class; it has comprehension, as being a name for the attribute "human nature."

The Extension of the common term is, naturally and necessarily, the more prominent relation of the two, in thought as well as in expression. It costs an effort to think, and it requires an abstract form to express, the common term as the name of an attribute. The common term, as the name of a class of objects, is readily thought, and finds its expression in a concrete form. Again, the relation of number, or of whole and part (involving quantity in one phase or another), is an element of every thought in which a concept is one of the factors. The question must always be raised, whether the objects thought of are all, or only some, of the objects constituting the class: the question is, in other words, whether a given term is, in a case under examination, used in the whole, or only in a part, of its extension.

There emerges thus the doctrine of that which logicians call *Quantity*. Every common term must be considered with reference to its quantity. It must either be *Distributed*, that is, applied to all the objects of the class; or it must be *Undistributed*, that is, applied to fewer than all of the objects. Distribution and non-distribution are indicated by prefixed Quantitative Signs: "all" or "any" for the former, "some" for the latter. A proposition, again, is specially said to be *Universal* when its subject is distributed, that is, when the antecedent of the judgment is the whole of a class; it is said to be *Particular* when the subject is undistributed.

8. Logic does not require to assume that common terms have undergone any deeper probing, than that which detects in them the formal expression of the correlation between substance and attribute, and of that reference of objects to classes for the sake of which the correlation is thought of. But both their character, and the limits which circumscribe logical dealing with them, may be more clearly understood, through a cursory glance at those objective conditions by which their formation is determined.

Classification, as a process yielding concepts and terms which import real knowledge, is very far from being arbitrary. When we endeavour to refer objects to a class, in virtue of a common attribute, that which is sought is, in effect, some one law under which we may know or believe that all the objects are placed. But every thinkable object is, in virtue of the complications involved in life and nature, amenable to many laws, and may therefore be thought of as possessing each of many attributes. Each individual object may be placed in any of many classes, or have affirmed of it any of many common terms, denoting attributes common to it and to other objects, that is, laws which both they and it obey. So, likewise, of any class of objects (if we set aside the unpractical case of a class wide enough to

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contain all others), it must be affirmable that it is included in some other class; while of most classes it must be affirmable that they are, when considered with reference to diverse attributes or laws, included in each of many others. Thus common terms are affirmable of each other; and it is out of such affirmation, with the negations accompanying it, that there comes the only matter of reasoning difficult enough to reward scientific scrutiny, or complex enough to bring into play the highest logical doctrines.

Again, the classes which are thus comparable can very seldom be co-extensive: those which we do compare in ordinary facts of thinking never are so. Common terms, accordingly, distribute themselves into systems, each of which constitutes a graduated series. A class containing certain objects is placed in a class containing these objects, together with others. This second class is similarly placed in another, containing all its objects, but not these alone; and the series may so rise in many successive steps. Thus we may pass from "man" to "animal," from "animal" to "creature organized," and thence, if we will, to "created being." When terms are taken in such an order, their extension increases at every step; each succeeding class is thought of as containing more objects than the class which last preceded it. A very little reflection will show that, contrariwise, the comprehension of the terms has decreased at every step. Each succeeding term implies an attribute (simple or complex) fewer than that by which it was last preceded. "Animal," being the name of a class containing objects besides "man," ceases to suggest the attributes which distinguish man from those other objects; and "organized creature," as being the name of a class containing both "animals" and "plants," ceases to suggest the attributes which distinguish "animals" on the one side, and "plants" on the other. In short, when we think according to this order, we are, step by step, thinking *in* objects, and thinking *out* attributes. This is the course of thought which is usually called Generalization.

The counterpart of it is the process of Specification or Determination. In it we begin with the most extensive class, and descend, step by step, till we reach the lowest. In so doing, we are, quite as evidently, thinking *out* objects and thinking *in* attributes. Each successive class in the descent contains fewer objects than the last; but each possesses, in addition to the attribute of the preceding class, the attribute possessed by its objects, and wanting to the objects which with it make up the class preceding.

Thus there comes to the surface one of the most valuable of all the laws from which logic draws corollaries bearing on inference. It is the *Law of the Inverse Ratio* which subsists between the Extension of common terms and their Comprehension.

Corollaries
as to com-
mon terms.

9. There may be noted, further, in the way of corollaries, one or two features of the common term, which are important as bearing on its logical uses.

(1.) The concept tends to fall back into the image. It is usually held that all class-names must originally have been the names of individuals; nor is it easy to suppose any other source for them. At all events, when we consider the existing state of language, without speculating as to its formation, it becomes evident that the common term, as being a name applicable to every object of the class, has a suggestive force, leading us downwards towards agination of objects individual. In this aspect, the term may be regarded as giving an inadequate idea, an obscure and vague image, of the individual,—an image that becomes more and more indistinct, the wider the generalization is which the term presupposes. Concepts, therefore, though properly representing, not objects, but the manner in which we think of them, cannot entirely lose their hold of objects: and reality, actual existence, operates as a normal limit to the formation of concepts and common terms.

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tion.

(2.) The concept, however, *qua* concept, is not used for the purpose of suggesting any reference to individuality. It is a thought of relation, and therefore a complex thought; its elements are discoverable, and may be brought to light in the form of a judgment. The signification of a common term is most clearly and fully perceived, when it is regarded as being an abbreviated symbol of a complex proposition, the import of which might be formulized in some such shape as this: "All the objects thought of are objects possessing a certain attribute, and therefore constituting a certain class."

Indeed, this manner of considering terms, as being shorthand expressions for propositions previously gained, is capable of being put to very various uses. All logical rules which are easily available, and all primary logical principles, are brought to bear by the separate extrication, from propositions, of the terms which are their objective factors. If we attempt logically to compare propositions without such dissection, they can be treated only through the cumbrous and derivative rules of hypotheticals, or other complex forms of predication. Categorical predication, the normal and simple expression of judgment, yields the terms immediately and easily. But such predication is often not attainable till propositions have been condensed into the form of terms; and it is, perhaps, traceable always to such a condensation, which we perform spontaneously and continually, guided by the irresistible desire of making language keep pace, as far as its natural slowness will allow, with the electric rapidity of unexpressed thought. This condensation comes into action with especial frequency in our thinking of universals; since these are never thought unless through words.

CHAPTER II.

The Function and Axioms of Logical Science.

10. Knowledge requires both to be gained and to be verified. It is desirable that we should obtain aid, through systematic laws, both for discovering new truths and for testing the results of alleged discovery. A Theory of Derivative Knowledge would be complete, if it issued a twofold code, ruling, with scientific accuracy, processes of both kinds. The two-
fold code of
discursive
thought.

A system aiming at the former of these ends is properly constructive or positive: if it is capable of justifying its promise, operations directed by it will yield positive additions to our knowledge. A system aiming at the other end is no more than regulative or negative: it can only enable us to decide, whether that which is presented as knowledge deserves or does not deserve the name.

It is confessed by all that the Code of Discovery has never yet been thoroughly digested; it is believed generally, and perhaps universally, that it must always at many points remain imperfect. In all the shapes in which it has been promulgated, it is described commonly, though neither quite correctly nor quite completely, as the Philosophy of Induction. Some of those who have legislated for this region of logical science maintain it to be practically independent of the other; not that they hold the testing of results to be unimportant, but that they believe this duty to need no scientific assistance, and to be safely left to native sense and practised sagacity. By such thinkers, the laws of discovery are asserted to constitute the only logical system that is worthy of study. Others allow, more correctly, that a developed theory of the processes by which thought may be tested, is imperatively necessary as the foundation for a theory of discovery. These speculators usually consider the systematized theory of induction or discovery as constituting, in one department or in several, an Applied or Particular Logic; in respect that it is a scheme in which logical laws, the laws for the testing of thought, are applied to special uses, varied by the varying character of the purpose and the matter.

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tion.

The Testing of Discursive Thought is the function undertaken by that system of logical science, which has been called the Aristotelian, from its founder or greatest expositor; the Syllogistic, from the process which is its highest development. It has been spoken of as a Pure Logic, because it is, or may be made, as far free from assumptions foreign to it, as any science can be which has human thought for its matter, and by which, therefore, certain laws of the human mind must be taken for granted, on the faith either of ordinary experience or of psychological analysis. It has been called Universal Logic, because its laws are applicable indifferently to all processes of discursive thinking, whatever may be the kind of the matter or objects thought of. Often, also, for the last of these reasons, it is called Formal Logic: its laws are laws, not of the matter of thought, but of the form or manner in which the matter is thought of. It professes to assign laws through which, on the assumption that the data of derivative knowledge are true, it may always be determined, either that the results are true, or that their truth or falsehood is not fixed by the data. This profession the science makes good, with a comprehensive precision which has, paradoxically enough, been turned into a ground of objection to it.

First deter-
mination of
the func-
tion of
logic; the
regulation
of explica-
tive
thought.

11. That which will here be attempted is an exposition of the laws constituting the science of Pure or Universal Logic. These, indeed, are the only laws which can correctly be called logical. The theory of discovery is logical so far only as it rests on those laws, as it must do by implication even when it does not expressly assume them; and it is only through them that the process of discovery can be philosophically theorized, with reference either to its capabilities or to its shortcomings.

It is difficult, perhaps impossible, to reach a formal definition of Logic, which shall at once mark out precisely the limits of the science, and describe its function clearly and exactly.¹ All the purposes of such a definition will be attained, if we can apprehend correctly these three points: first, the character of the mental process which the science examines; secondly, the character of the law which regulates the process, and the development of which is the duty undertaken by the science; thirdly, the character of those objective conditions under which only the process is possible, and with reference to which, therefore, the law must be expounded.

¹ In the following definitions and illustrations, that which is signified by the name "Thought" is discursive thought. "Logic is the *a priori* science of the necessary laws of thought, with reference, not to particular objects, but to all objects whatever." (Kant, *Logik; Einleitung*). "Logic is the science of the rules of thought." . . . "It takes no account of differences among the objects. It contains, therefore, rules for thought as thought; and these rules must consequently be universal and necessary, that is, they must be laws." (Kiesewetter, *Logik*, i., pp. (5) 7, ed. 1824). "Pure logic is the science of the form of thought." (Hoffbauer, *Logik*, p. 27, ed. 1810). "Logic is the science of the laws of thought as thought—that is, of the necessary conditions to which thought, considered in itself, is subject. This is technically called its *Form*. Logic, therefore, supposes an abstraction from all consideration of the *matter* of thought—that is, the infinitude of determinate objects in relation to one or other of which it is actually manifested." (Sir W. Hamilton, *Edition of Reid*, p. 698). "Logic is a formal science: it takes no consideration of real existence or of its relations, but is occupied solely about that existence and those relations which arise through, and are regulated by, the conditions of thought itself." . . . "Logic is discriminated from psychology, metaphysics, &c., as a rational, not a real—as a formal, not a material—science." . . . "It has, in propriety of speech, nothing to do with the process or operation, but is conversant only with its laws." (Hamilton, *Discussions*, pp. 144, 136, 134). "Analytical logic is the science of the formal laws of inference." (Karslake, *Aids to the Study of Logic*, part i., p. 11). "Logic is the science of the laws and products of pure or formal thinking." (Mansel, *Prolegomena Logica*, p. 245).

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tion.

(1.) Logic is the Regulative Theory of Explicative Thought. If it were necessary to lay down an express definition of the science, this assertion might be offered as being such: all closer examination yields only explanations of it. But not a little explanation is required.

Thinking may be either Explicative or Analytic on the one hand, Ampliative or Synthetic on the other.¹ For processes of either kind, there must be given one thought at least—a datum or Antecedent. We explicate that thought when we extricate or evolve from it another thought, a thought describable as a Consequent of the first. Inference, reasoning, discursive thought, is merely explication of thought through analysis. If, at any step in the progress of our thinking, we assume any thought not involved in those which had previously been given or evolved, we amplify our thought, we augment the matter of our thinking by the addition of a new datum or antecedent. If this new datum is synthesized or combined with our old ones, or with the thoughts which have been explicated from them, we may institute a new process of explication, in which we infer from our amplified aggregate of data.

It is for pure explication only that logic is competent to legislate. A process to which logical canons are applicable, must be one in which there takes place nothing beyond this; that the constitutive elements of a given thought or thoughts are detected through analysis, and that there is evolved some thought which was involved or implied in the thought or thoughts given. The consequent differs from the antecedent in this only; that the former explicates, brings to light, enables us to think distinctly, something which in the latter was only implied, and, therefore, thought more or less obscurely. Derivative thought, like water flowing through conduit-pipes, cannot rise above the level of its fountain. The truth or falsehood of the thought or thoughts assumed as the starting-point, must be determined by objective considerations, not by the laws of thought. In the same predicament is any uninvolved thought that may be interpolated in the course of the evolution; and, indeed, the introduction of any such thought just makes the beginning of a new process of evolution.

12. (2.) Explicative thought is regulated exclusively by Second law, the Law of Consistency.

The character of this law determines, in several successive steps, the character of the process of explication.

In the first place, it determines the character of the antecedent. If there could be any such thing as a simple thought—a thought which is not analysable into constitutive thoughts, or in which no other thought is implied—such a thought would not be explicable or subject to the law of consistency; and if, in any individual case, we cannot discover what thoughts a given thought implies, that thought is for us inexplicable. Accordingly, a thought given for explication must be assumed to be complex.

Further, the complex thought, given for explication, must be resolvable into the thought of a relation. What this relation is, we cannot think clearly, unless in the form of a judgment, expressible by a proposition. When we ask whether ideas or terms are consistent or inconsistent with each other, the question really is, in what manner the relation presupposed between the ideas qualifies them for being combined as terms of a judgment. Further still, the testing of consistency or inconsistency cannot be exhaustive, until the judgment has been analysed into the elements which in the proposition are signified by the subject, the predicate, and the copula.

Logical rules being most conveniently enounced with reference, not to the judgments and compared ideas, but to the propositions and terms through which these are expressed,

¹ Analytic and synthetic (Kant); Explicative and ampliative (Hamilton).

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tion. the law is technically named with the same reference. It is thus called *The Law of Non-contradiction*.

This law, then, might be thus set forth, with reference both to the thought and to its expression, and in the negative aspect which is fittest for laws having uses regulative or prohibitory. "Ideas must not be combined in a judgment, in a form inconsistent with the relation presupposed between them or the objects they represent. Terms must not be combined in a proposition, in a form contradictory of their presupposed signification."

Third de-
termina-
tion of the
function of
logic; the
develop-
ment of the
principle
under uni-
versal ob-
jective
conditions.

13. (3.) This law, self-evident to the extreme of triviality, is not available for use until it has been specified in more degrees than one, through consideration of the Character of those Objects which are Thinkable.

Thinking is possible only when there is given to it matter to be thought of: there must be not only a thinking subject, but a thinkable object. Thinking, accordingly, is conditioned, limited, determined, in each of its two opposite relations. It is conditioned not only subjectively, that is, by the laws which regulate thinking as a function of the thinking mind, but also objectively, that is, by the character of the objects of which it is possible for man to think.

Logic is enabled to elicit formal laws which are universally applicable, not by achieving the impossibility of ignoring the objects of thought, but by considering, of the differences in the kinds of objects, those only which necessarily modify the form of thought or the manner of thinking. Now the number of those differences is the smallest that admits difference at all. We think of objects either, first, as having existence actual or possible; or, secondly, as having also mutual relation. The former of these objective conditions yields the idea of Individuality, the latter that of Universality. Under the one idea or the other all thinkable objects are thought. Individuality, as being the form of existence, lays the foundation of knowledge through intuition; universality, as being the form of relation, makes representative thought available as the instrument of knowledge explicative or discursive.¹

All propo-
sitions re-
solvable
into asser-
tions of
identity or
difference.

14. The law of non-contradiction receives its simplest application in Judgments whose Objects are Individual. This application likewise yields the normal form of the law, the form from which all other forms of it are derived, and into which all of them are in the last analysis reducible. That, in this its simplest shape, the law is (as we shall see) not so expressible as to avoid the double censure of triviality and barrenness, is a fact which would prove only, if proof were needed, that thinking which attempts to compare objects merely as individuals, without regard to their attributes or laws, not only requires no express rules, but is wasted on matter which can yield no real development of knowledge. It is nevertheless true, and demonstrable, that the most complex reasonings in which classes of objects are compared, owe their validity to that one self-evident principle, and that all logical canons are merely corollaries from it.

It is indeed impossible to think, even of individuals, unless under the condition of relation. Individuality implies the relation of number. Therefore, at the very outset, there comes up an indirect refutation of the possibility of constructing a system of logic, which shall be purely a theory of thought, and shall presuppose nothing whatever in regard to the objects thought of.

If, then, a thought having an individual object or objects is to be explicated into the form of judgment, there stands, as a barrier at the entrance of the field, that subjective law of thought which determines all judgments as being either *affirmative* or *negative*. We must either affirm or deny: no other form of judgment is possible.

Whether, again, we are to affirm or to deny, is a question determined by this law, which governs thought in its relation to all thinkable objects. "All objects are primarily thought of under the one or the other of the counter-relations of *Identity* and *Difference*." Of objects individual, when we attempt to consider them purely in their individual aspect, this is a palpable truism. Any one given object is identical with nothing but itself; it is non-identical with every other object. If, then, one object only is given, and if an affirmative assertion is demanded, the only such assertion which the case allows is the tautological and trivial affirmation,—“The object is itself: A is A;” which is an application of the equally barren formula,—“Every thing is that which it is.” If, again, with the same datum, a negative assertion is required, we can frame only this negation,—“The object is not any thing which is not itself: A is not any thing which is not A (= A is not Not-A);” or, in the formulized shape, “A thing is not that which it is not.”

It is needless to say that, plainly, any other assertions than the two set down, would be contradictory of the assumption of the individuality of A.

But it must be asserted, broadly and peremptorily, that all the laws of inference are resolvable into this doctrine:—“An affirmation is an assertion of identity; a negation is an assertion of non-identity; and no medium is thinkable between the one assertion and the other.” In laying down this proposition, we allege the Law of Non-contradiction, and couch it in a shape pointing straight to its place as the central law of logical science

15. The law of non-contradiction is one and indivisible. The three But it may be regarded from any of more points of view logical axioms than one; and one of these will suggest itself rather than yielded by the prin-
the others, when the law comes to be applied on any spe- ciple. The
cial occasion. Accordingly it develops itself in one or laws of
another of three specific forms, which admit of being stated identity,
as three separate canons. These may be described as being difference,
The Three Logical Axioms. and deter-
mination.

Each of these, it must carefully be noted, is merely a partial evolution of the one central law; each of them implies the other two, and would lose not only its force, but even its meaning, if either of the others were wanting. It thus becomes extremely difficult to keep them separate in expression; and, besides this, it is often a matter of choice, to be fixed by the particular aspect in which we contemplate a given process of thought, which of the three is to be held as the rule directly bearing on it. For all these reasons it may be doubted, whether the older practice of leaving the law unevolved, was better or worse than that attempt at distinct evolution of it, which has been adopted by the ablest of the modern logicians, and is here followed in deference to their opinion.

The logical axioms may be introduced in some such shape as the following:—

First, Affirmative judgments are ruled by the Law of Identity. “An affirmative proposition is not secured against inconsistency, unless its predicate may be thought as identical with the subject.” The primary formula of affirmation is this:—“A is A.”

Secondly, Negative judgments are ruled by the Law of Difference or Non-identity. “A negative proposition is not secured against inconsistency, unless its predicate may be thought as non-identical with the subject.” The primary formula of negation is this:—“A is not Not-A.”

Thirdly, Any two ideas must be either affirmable or deniable of each other. “Of any term as subject, any other term must be either affirmable or deniable as predicate.” This axiom is usually called the Law of Excluded Middle, a name intimating the impossibility of any assertion intermediate between the two. It has also been called the Law of Determinability or Determination. The formula is this:—

¹ See Note at the end of the Chapter.

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tion.

"Every thing is either A or Not-A: every thing is either a given thing, or something which is not that given thing."¹

Even when viewed from this distant and somewhat hazy station, the axioms yield, more easily than it can be gained otherwise, one distinction which we shall find to be very widely useful. Two Terms, differing in this only, that the one wants, while the other has, the prefixed symbol of negation, are said to be Terms Contradictory. Thus, A and Not-A are contradictory terms. Two terms so related cannot be either affirmed or denied of the same object or group of objects. Of whatever object or objects A may be accepted as a name, Not-A must be understood as a name that covers every thinkable object besides. Such terms are the only terms which are formally and necessarily exclusive or contradictory of each other. If any two terms not formally so distinguished are held to be contradictories, it is because their relation is thought as being equivalent to that of formal contradiction.²

¹ The only point seeming to require comment is the position of the Third Axiom, which some logicians have mistaken so far as to attempt deducing it from the other two. It lies, in fact, subjectively deeper than either of them: a proposition disobeying either of them would be inconsistent with its data, but yet possible; a proposition disobeying the third axiom is inconceivable. The determination towards either affirmation or negation is a law of judgment, discoverable before all scrutiny of objective relations. Yet the third axiom, in the shape in which it has just been couched (or in any other making it available for use), is not independent of the other two. Though we know before-hand that, if we are to assert at all, we must either affirm or deny, we yet do not, surely, know what terms must be affirmable or deniable of what others, till we have, through the first and second axioms, resolved affirmation and negation into assertions of identity and difference. This resolution being made, we are reminded that any two terms must denote either one and the same object, or two objects which are different. If the former is the case, there is ground for affirmation; if the latter, there is ground for negation: and thus only does it appear that predication of the one kind or the other is possible with any two terms.

² The formal evolution of the Law of Non-contradiction into the Three Axioms has been a gradual process, brought to its consummation by the German logicians since the time of Kant. The laws of identity and difference have often been treated and expressed as one, oftenest called the Law of Contradiction; and, perhaps, the doctrine is most clearly apprehended when taken in this way.

The older logicians, as well as some of the more recent, seem to have frequently lost their way to the strict application of the law, through want of distinct thinking of the Quantitative Sign as an integral part of the term; an indistinctness which issued in the explaining away of numerical identity and difference into identities and differences specific and generic. The law of excluded middle, constantly and inevitably assumed and acted on, was kept in the background through the very facts of its palpability and its originally subjective obligation. Its formal introduction into logic as a separate axiom appears to be modern. Bachmann has collected a good many points in the recent history of the three axioms. (*System der Logik*, part i., sect. 2).

By Kant himself, and by several other German writers, there is added to the law of non-contradiction, as being also a logical law, Leibnitz's principle of the Sufficient Reason. There is unquestionable soundness in the objection taken to this addition by Sir William Hamilton, and by more than one of the Germans. If the doctrine means that nothing can exist without a sufficient reason, it is an assertion of the metaphysical law of causality; if it means that nothing can be believed or known without a sufficient reason, it is an assertion developed purely out of the laws of identity and difference.

The law of non-contradiction was neither generalized, nor formally planted at the root of the science, by any of the Greek logicians. (See Prantl, *Geschichte der Logik im Abendlande*, vol. i., 1855). Prantl, however, cites references by Plato to the law of identity (the bearing of which he questions): and he has made, from Aristotle, a large collection of passages which yield unequivocal assertions of all the three axioms; while, also, the law of identity is explicitly declared by Aristotle to be the firmest principle of thought. The following, selected from Aristotle by Trendelenburg for his *Elementa Logices Aristotelicae* (ed. 1852, §§ 9, 10,) are probably more marked than any other of Prantl's quotations.—"Τὸ αὐτὸ ἄμειν ὑπάρχειν τε καὶ μὴ ὑπάρχειν ἀδύνατον τῷ αὐτῷ καὶ κατὰ τὸ αὐτό.

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tion.

16. The axioms, as universal laws of thought, must cover all possible cases. The case, also, which has been considered, deserved special notice; because the supposition of one object, as the only thing given to be positively thought of, brings out, with a clearness not otherwise attainable, the primary idea of negation, as an explication of non-identity. That, in attempting affirmation with such data, we are driven on an assertion which is no real explication at all, is a fact not only to be accounted for easily, but leading us rapidly towards the development of the axioms in those cases for which the question of their use is important.

The datum of a proposition is, a relation between that which is denoted by the subject and that which is denoted by the predicate. But when we were required to think of A only, no predicate was given. For negation we found a predicate, by seizing on the supposition, implied in the oneness of the subject, that there must be other thinkable objects besides that, whatever it may be, which our subject signifies. But, the subject being, by the hypothesis, not only one, but something as to which we know positively nothing except its unity, a datum for real affirmation was wanting.

What would have sufficed to supply the want? Another Name, say B, for the thing denoted by the subject: out of this would have come the affirmation, "A is B."

Now, the interpretation to which a proposition thus generated is open, is one which may be put on all propositions whatever. Every affirmative proposition is equivalent to an assertion, that the subject and the predicate are but two different names for one and the same object, or group of objects: every negative proposition is equivalent to an assertion, that the subject is a name for one object, or group of objects, and that the predicate is a name for an object or group of objects different from the first. Besides being universally applicable, this is, of all interpretations of the proposition, that which is most purely formal; and, as being such, it has a peculiar aptitude for logical use. On this reading, the doctrine that affirmation and negation are assertions, respectively, of identity and non-identity, falls back into the class of truisms, if indeed it ever quitted or was in danger of quitting that class. A system of logical doctrines, seeking no further interpretation of the proposition, would be the nearest conceivable approach to a purely formal development of the science. We may often have occasion to recur to this reading, as the readiest means of showing how the special logical laws are only corollaries from the axioms.¹

... αὐτὴ δὴ πασῶν ἐστὶ βεβαιωτάτη τῶν ἀρχῶν . . . ἀδύνατον γὰρ ὄντινόν ταιῦτον ὑπολαμβάνειν εἶναι καὶ μὴ εἶναι. . . διὸ πάντες οἱ ἀποδείκνυντες εἰς ταύτην ἀνάγουσιν ἐσχάτην δόξαν." (*Μεταφυσικά*, iv. 3). "Δεῖ πᾶν τὸ ἀληθὲς αὐτὸ εἶναι ὁμοιολογούμενον εἶναι πάντη. (*Analytica Priora*, i. 32; where the law is alleged as justifying the syllogistic reduction). "Ἀντίφασις δὲ ἀντιθέσις ἥς οὐκ ἔστι μεταξὺ κατ' αὐτὴν μόνον δ' ἀντιφάσεις τὸ μὲν τί κατὰ τινος κατὰφασις, τὸ δὲ τί ἀπὸ τινος ἀπόφασις." (*Analytica Posteriora*, i. 2). The express reference of logical rules to axiomatic principles has been traced to Galen. He, in his treatise *De Methodo Medendi*, states, as examples of such, (*λογικαὶ ἀρχαί*), several axioms, for the explicit treatment of which he refers to his work *On Demonstration*, now lost. Among the instances he gives are these: the mathematical axioms, the law of causality, and the law of excluded middle; "τὸ περὶ παντὸς ἀναγκαῖον ἢ κατὰφάσειν ἢ ἀποφάσειν." (See Prantl, p. 562).

¹ "A proposition is a speech consisting of two names copulated, by which he that speaketh signifies he conceives the latter name to be the name of the same thing, whereof the former is the name, or (which is all one), that the former name is comprehended by the latter." . . . "An affirmative proposition is that whose predicate is a positive name, as "man is a living creature;" a negative, that whose predicate is a negative name, as "man is not a stone." (*Hobbes, Computation or Logic*, part i., chap. iii., §§ 2-6). On this interpretation of the proposition, as a Fact of Naming, Mr Mill, rejecting it as insufficient for founding the strongly objective position he is to take up, makes these remarks:—"The assertion which,

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tion.

Let us, in the meantime, test it by an example or two. "All logical doctrines are truths." It is meant, of course, not that logical doctrines are the only truths, but that they are some of those objects we call truths: "All logical doctrines—are—some truths." Plainly, the assertion is resolvable into this other; that the objects which we call "all logical doctrines," are the very same group of objects which we call also "some truths." Our names being assumed to be justified by the fact, every individual thing denotable by either name is denotable likewise by the other: the one group of objects receives two different names, when it is considered from two several points of view. Again, "Logical doctrines are not paradoxes." Here we speak not only of "all" logical doctrines, but also of "all" paradoxes: we assert that the objects we call by the first name are not to be found anywhere among the things we call by the latter. The assertion admits this analysis:—The objects called "all logical doctrines," are non-identical with the objects called "all paradoxes." Each of the objects receiving the one name is an object different from each and all of the objects receiving the other: "logical doctrines" and "paradoxes" are names of two groups of objects, neither of which contains any individual object identical with any individual object contained in the other.

The bearing of the law on propositions considered as predicating attributes and classes.

17. The meaning of a proposition is not exhausted when it is read as a Fact of Naming. Perhaps every proposition has a deeper meaning. This is certainly true of all propositions which assert any knowledge worthy of analysis; and the relations which ground the higher kinds of inference cannot be fully theorized until the analysis is carried further. A name is not given without a reason; and almost every name intimates more or less fully the reason for which it was given.

All the reasons for names are resolvable into our considering of objects as Substances possessing Attributes; and, in respect of such attributes, objects are distributed into Classes, the names of which are Common Terms. The subject may now be itself the name of a group of objects constituting a class or a part of one; the predicate may be the name of an attribute which is possessed or not possessed by those objects. But, since the predicate is itself also a class-name, there arises the further question, whether the class named in the subject is a part only of the predicate-class, or the whole of it, or no part of it at all.

In assuming even the applicability of two names to the same object, we had travelled far from the narrow nook of thought, which gave us, through the pure formulæ, our first glimpse of the developments receivable by the law of non-contradiction. We have travelled yet farther in assuming that each of the names is significant; and, when we regard the names as being, both of them, names of attributes, and through these of classes, we have reached the most cumbersome of the complications under which the question of identity or non-identity can be contemplated.

If we stop short at the point which exhibits the subject-term as being the name of a substance, or of a group of objects considered as substances, while the predicate is re-

according to Hobbes, is the only one made in any proposition, really is made in every proposition; and his analysis has consequently one of the requisites for being the true one. We may go a step further: it is the only analysis that is rigorously true of all propositions without exception. What he gives as the meaning of propositions, is part of the meaning of all propositions, and the whole meaning of some. . . . If, then, this be all the meaning necessarily implied in the form of discourse called a proposition, why do I object to it as the scientific definition of what a proposition means? Because, though the mere collocation which makes the proposition a proposition, conveys no more meaning than Hobbes contends for, that same collocation combined with other circumstances, that *form* combined with other *matter*, does convey more, and much more." (Mill, *System of Logic*, book i., chap. v., § 2).

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garded merely as being the name of an attribute possessed or not possessed by that object or objects, we may appear for a moment to have lost our way. The question, whether an object possesses or wants an attribute, is not very obviously resolvable into the question, whether the subject is or is not identical with the predicate. But even the most common expressions yield this interpretation; and the frequent shortcoming of the predicate—its expression through an adjective—is rapidly supplied, both in thought and in expression, when we take the further step of regarding the predicate as being the name of a class. Both terms of the proposition may now take the form of substantives; both, if common terms, may be taken as names directly denoting groups of objects, and only implying the attributes in respect of which the class-names are given.

If we assert that "All men are imperfect," the full meaning of the allegation is, that all men are a part of the class "imperfect beings;" that, in other words, "All men—are—some imperfect beings." If we assert that "No men are unimprovable," we signify that no men are any part of the class of unimprovable beings; that "No men—are—any beings unimprovable." In the one case we assert that the objects called, when thought of with reference to a certain attribute, "all men," are the same objects which, when thought of with reference to a certain other attribute, are called "some beings imperfect;" in the other case we assert, that the objects receiving the name "all men," are non-identical with "all" the objects receiving the name "beings unimprovable."

In a word, the relation of identity or non-identity, with the determination of thought towards the assertion of either the one or the other, covers all the complications, various as they are, which are made possible through the mutual ramifications of classes, as included one in another, wholly or partly, or as mutually excluded in whole. We have only to presuppose the correlation of Whole and Part (a correlation not arising in the comparison of individuals); to watch carefully, as to each of our common terms, whether as used in our propositions it denotes all, or only some, of the objects denotable by it, or constituting the class it signifies; and to remember that, of each term in its relation to the other, the words indicating whole or part ("all," "any," or "some"), must be thought as integral parts. These precautions being taken, predication through common terms is interpretable as an assertion of the relation of identity or non-identity, with the same ease as that which we find in so interpreting predication through singular terms.¹

18. Exception has frequently been taken to the formal statement of the law of non-contradiction as the one central doctrine of logic. It is not alleged that the law is either deniable, or so much as doubtful; but it is said (and this is the objection most frequently urged), that it is a mere truism, a truth so obvious as not to deserve explicit notice. The necessity of the axioms for the unity of logical science.

The same charge may be brought, with equal fairness, against the geometrical axioms; and these might be treated as the logical axioms have so often been. The truism, the "trifling proposition," that "Things which are equal to the same thing are equal to one another," might be refused a formal place in geometry; and the student might be invited

¹ It is especially to be observed that, when the quantitative signs are accepted as integral parts of the given terms, the identity or difference of the objects is strict and literal. We are thus rescued from all necessity of loosely translating identity and difference into likeness or unlikeness, or of instituting fine distinctions between identity specific and identity individual, between identity total and identity partial; from all those artificial expedients, in short, which have often perplexed so seriously the theory of inference, and made it so difficult to trace the laws of the process upwards to the one central principle.

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to supply for himself it and its fellows, in the demonstration of those initial theorems for which no derivative ground had as yet been laid down. Perhaps the practical evil would not be heavy; but the symmetry and coherence of an exact science would be annihilated.

When the logical axioms are refused their legitimate place, the mischief worked is incalculably greater than any that could arise from a similar procedure in mathematics. There have been constructed very many logical systems, which are quite adequate for the testing of any argument that could be given, and which yet want, not only the formal statement of the axioms, but all express reference to them. A science so treated cannot fail to lose much of that systematic coherence, which is the scientific and philosophical characteristic; and no science loses, through such treatment, more of that character than ours. It becomes an aggregate of rules which are really derivative, but which, not being centralized in their common source, not only exhibit no apparent unity or correlation, but degenerate (a weakness incident to a science so exclusively formal) into mere technical rules, usable and used without conscious reference to any principle at all.

In a word, the construction of logic through secondary laws exclusively, does and must destroy, or seriously impair, its unity as a science. Consequently, there is thus injured, likewise, the evidence of its speculative validity as an analysis of predication and inference. It is yet a worse evil, that this course of treatment diminishes largely the value of the study as a philosophical discipline of thought. In justice alike to the science, and to ourselves its students, unity of system, and consistent development of doctrines, should be steadily aimed at; and it must firmly be maintained that this purpose can neither be reached, nor so much as approximated, unless the law of non-contradiction be expressly laid down as the axiomatic foundation, and unless, also, there be expressly resolved into that law all doctrines whose dependence on it is not self-evident.

Develop-
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axioms in
reference
to terms
interpretable.

19. It is possible to test the validity of every inference, by a direct analysis of its propositions as assertions of identity or difference. For some of the purposes which the science is designed to serve, such analysis would be quite sufficient. It might, for instance, yield an exhaustive and competent theory of immediate inference. But it would not enable us thoroughly to theorize the syllogism. Syllogistic arguments given might be adequately treated in this fashion; but the character of the syllogism as a representation of several distinguishable processes of thought could not be efficiently displayed, without exhibition of those objective modifications under which the relations of the syllogistic elements come to have place.

With a view to such developments, and also for another reason, the three axioms will here be presented in one or two of the shapes which they may assume, when they are considered with pre-supposition of interpretation of the terms used in propositions.

The other reason is this. The doctrine, that inference is merely an explication of the implied, although it is a truth both undeniable and instructive, is a truth which is far from being palatable. When we are first asked to make ourselves familiar with it, we are apt to forget how mighty is the difference between implication and explication. It costs us an effort to become convinced that the difference is that between obscure thinking and thinking that is distinct—between a thought which is isolated in consciousness and a thought of which we are conscious as an element in a system; that it is the difference between impotence and power, between a cloudy dawn and a sunny noon-day. It is desirable, then, to place this difference in full light.

Now, the contrariety of character between a thought implied in the subject of a proposition and the same thought

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evolved in the predicate, has been anxiously brought out by the framers of those forms of the axioms which are here selected from many others. The concrete character of the cases contemplated in these theorems causes difficulties of expression, which make it desirable to give alternative views, both for avoidance of mistake, and for the suggestion of reflection.

(1.) Whatever is implied in the signification of a term given as the subject of a proposition, may, as predicate, be explicitly affirmed of the subject. Any notion which is implicitly thought in the subject may be explicitly affirmed in the predicate. Of any object or objects denoted by the subject, there may be affirmed in the predicate any attribute consistent with our thought or notion of the subject.

(2.) Whatever is inconsistent with the signification of a term given as the subject of a proposition, may, as predicate, be denied of the subject. Any notion, the contradictory of which is implicitly thought in the subject, may be explicitly denied in the predicate. Of any object or objects denoted by the subject, there may be denied in the predicate any attribute inconsistent with our thought or notion of the subject.

(3.) Of any term given as the subject of a proposition, any other term must be either affirmable or deniable as predicate. Of any object or objects denoted by the subject, any attribute whatever must be either affirmable or deniable in the predicate.

20. It is only for the sake of predication and inference through common terms—for the sake of processes explicative relating the relation between class and class of objects compared in respect of diverse attributes—that logic is worth elaborating into a scientific shape. Knowledge worthy of the name—knowledge the acquisition of which is a duty adequate to the capacities of intelligent beings—knowledge fitting man to act, imposing on him responsibilities, and enabling him to merit rewards—is a knowledge of the attributes of objects, of the laws by which they are governed, of the compass of those several laws, and of the fine and manifold relations in which, through likeness and unlikeness of law, man is placed towards man, and each man towards nature and the Power that governs it and him. Our knowledge of individuals is clear and bright, and shines out spontaneously through intuitions, which dawn on us without our seeking; but the light which thus we see, illuminates a region within which rational life has hardly begun to germinate. Our knowledge of laws is reached only through self-determined energy, through struggles to emerge from doubt, and contentings against error, and slow and painful ascent from height to height of cognition. But, while we do struggle, and contend, and rise, the horizon broadens round us, and our mental vision gains new strength and delicacy from exertion. The idea of law itself passes into that of causality: objects which obey law do so either as causes or as effects. Out of causality again emerges the great idea of purpose; for purpose is preconceived effect, and the efficient cause becomes operative towards this effect as means. Purpose carries us upward, through cause, into the sphere of mind, of thought and will as attributes of beings capable of designing; while here we find ourselves to have adventured into a field of inference, widening our view as we advance, till we have reached the contemplation of one overruling Purpose, of which perceived objects, and discovered laws, and physical causes, and human will, are but the exponents, and consequents, and ministers.

In all the paths which mind can traverse, logical laws are operative as prohibitions guarding against divergence. Logic is concerned, not with the matter of thinking, but only with its forms. Over these, however, it holds exclusive sway. And there is a necessity for the exercise of its powers,—a necessity which becomes the more pressing as the known relations of objects grow wider and more complex. The

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law of non-contradiction could not be violated at all, were it not for the need we lie under of thinking through words, whenever we do think of any thing that is not individual. If every object had but one name, violation of the law would be practically impossible. It is because every object has many names, that the natural course of thinking betrays us into judgments in which the law is unconsciously broken. It is because of the intertwining and often conflicting relations of all thinkable objects, that words are so apt to be used as symbols for thoughts which they do not clearly represent; and the more various and extensive the relations are, the more imminent becomes the danger of self-deception. Therefore it is that logical laws are valuable, not to supply matter for thought, but to test the genuineness of thought, and to protect thinking from being disguised through its expression.

The rela-
tions of
logic to
truth.

21. Logical laws are the scaffolding which gives support to derivative knowledge in the course of its construction. When the structure has been completed, they become for us the plummet and level, through the use of which may be determined the firmness or instability with which it bears on its foundation. But logic does not, and cannot, carry a single stone to the building.

It enables us to explicate, not the relations in which objects exist, but only the relations in which they are thought. The attempt to fix the truth or falsehood of any one proposition given in isolation, is not more palpably extra-logical, than is that of incorporating into the science principles really metaphysical or ontological, that is, bearing on the universal relations between knowledge and existence. This consideration justifies and commands the positive exclusion of all such doctrines as those of the Categories, and of Modality in Propositions. A prohibition which there may be a greater risk of disobeying, is that which excludes all questions as to the objective truth of given classifications, that is, as to the relations actually connecting or separating the objects designated by given common terms. All judgments given for logical analysis, are, for logic, virtually hypothetical. The objects thought as constituting the class may be non-existent; the law through which they are combined may be imaginary; some or all of the objects may be exempt from the law. It is always important, it is often unspeakably so, that we should learn whether it is true that none of these negations has place, and whether therefore a given class-name implies a fact of real and positive knowledge. But this is a question to which, in all its parts, logic stands resolutely silent.

The science must, indeed, look abroad on those objective conditions, those relations between thinking and that which is thinkable, by which the human intellect is fenced in, round and round. But it asks only how those conditions modify the manner of thinking; it takes account of none of them but such as do necessarily determine thinking towards one or another of its only possible forms: and it scrutinizes them for no further purpose than that of eliciting and explaining those forms. When the astronomer looks down from his watch-tower, he is pleased and grateful to see how the sun illuminates the earth, and diffuses life and gladness over the expanse of animal and vegetable nature; but his duty is that of surveying the heavens, and discovering the laws which guide the stars in their courses. With no less satisfaction does the logician perceive that truths, good for man, are revealed in those intuitions on which all thinking rests; but it is no part of his function even to assert those truths, far less to justify or systematize them.

Thus is Logic placed towards all those principles which it either develops, or assumes as given. The correlation of identity and non-identity is itself a law metaphysical as well as logical, a law of existence as well as a law of thought; but it is only in the latter aspect that it is logically import-

ant. So is it as to all those other relations, without the assumption of which the law of non-contradiction cannot be developed. Number, quantity, whole and part, are sufficiently treated for our purpose, when they are regarded as conditions determining the forms in which objects are thought of. Perhaps, again, the relation of substantiality covers, in logic, a wider ground than any other of those modifying conditions. But the most paradoxical or sceptical denials or doubts as to this relation would leave, untouched, the formal view which we have to take of substance and attribute, as being actually correlatives, and thinkable only together, but as admitting of being thought from either of two opposite points of view, which give prominence alternately to the one and to the other.

In short, Logic seeks to develop one principle only—the central Law of Non-contradiction. It develops that law with reference to certain modifying principles: but these it assumes only as given in actual experience, and does not seek to develop; and, further, it assumes them only as being (what they undeniably are) psychological laws, laws regulating thought—declining to inquire into their ontological character as laws of being.

22. The desire of illustrating clearly drives us often, in logical writing or teaching, on exemplification through propositions whose terms have meanings known to those we address. There is a danger in this. The truth or falsehood of each of the propositions being thus known, the mind is allured away from the logical question, whether one proposition does or does not follow from another. Symbolic terms, of the algebraic type, are, in spite of their dryness and repulsiveness, by far the aptest for logical examples.

We cannot see distinctly what the problems are which the science is able to solve, until we consider it as working on materials of this indeterminate character.

Logic neither undertakes nor requires any interpretation of given terms. It is bound to deal with terms which may mean any object whatever, and which are not given as the names of any fixed objects. But no terms can be treated by logical re-agents, unless they are given in a shape that fits them to the crucible. Every term must signify something; and logic cannot deal with terms unless there be given to it the minimum of their signification. The science, like every other, has its *Postulates*.

The Postulates are specified sufficiently, when they are stated with reference to the narrowest data. They are two. Logic must require, as preliminary conditions of its activity, answers to one or both of two queries bearing on every given term. *First*, Is the term singular or common? *Secondly*, If the term is singular, no further information is required. But, if it is common, this other question must be put: Is it in the given case distributed or undistributed?—Is it used in the whole of its extension, or only in a part of it? Both queries bear on the Quantity of the terms, the question which, as we have seen, arises secondarily in logic. If we had to deal only with the Quality of propositions, which is the primary logical question, it would not be necessary to put them.¹

¹ Both of these demands are virtually embraced in Hamilton's *Fundamental Postulate of Logic*: "That we be allowed to state in language what is contained in thought." (Baynes, *New Analytic of Logical Forms* (1850), p. 4). There will hereafter be much of reference to the opinions of that distinguished thinker and profound scholar. Therefore it may be well to say, here, that the present writer's acquaintance with them is derived exclusively from the outline just referred to, which was published with Sir William Hamilton's sanction; from Sir William Hamilton's volume of *Discussions* (1852); from incidental notes in his edition of Reid (1846), especially those on Reid's *Account of Aristotle's Logic*; and from a few observations furnished by him to the last edition (1854) of Mr Thomson's *Outline of the Necessary Laws of Thought*. It is to be hoped that the promised publication of Sir

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Both queries are, to a certain extent, answered by the forms in which assertions are usually couched, when these have, as in ordinary speech, terms of fixed signification. But, when they are not so answered, the answer must be sought, that it may be incorporated in the expression of the terms. Singular terms require and receive no Quantitative Signs. Common terms do require either "all" ("any") or "some," and should have the one or the other, whether they be subjects or predicates.

The postulates are reasonable. They do not stretch a step beyond those two objective conditions (individuality and universality), by the one or the other of which actual thinking is formally modified. The logician is bound to provide laws applicable to terms whose meaning is as arbitrary as that of algebraic symbols. But the algebraist, too, has his formal postulates. His a, b, c , and x, y, z , are thus far fixed in signification, that all of them denote numbers; and he is warned, by pre-arranged marks, whether the numbers are integers, or fractions, or powers. Our terms, even though symbolic, are thus far fixed in signification, that they must denote possible objects of thought, and objects thought under one or another of certain conditions. In demanding what the given conditions are, we ask for explanations exactly parallel to those which are allowed to the mathematician. No narrower pre-information will suffice, if logic is to be anything better than a theory of dreams.

The formal
limits of
logical ana-
lysis.

23. The postulates being granted, let us ask, lastly, what data, furnished with them, give a hold to laws purely logical. The relations of common terms are the only ones with reference to which it is worth while to generalize the cases.

First, The narrowest datum on which logic can work without foreign aid, is one proposition,—the assertion, through a copula, of identity or non-identity between two terms quantitatively determined. From such a datum, the science can regulate and justify the evolution of certain other propositions by Immediate Inference.

Secondly, Logic can work with incalculably greater freedom on two propositions given. These are data for the normal form of Mediate or Syllogistic Inference. (1.) The data may not yield, by inference, any third proposition. If so, the reasons of the failure can be shown. (2.) The data may yield, by inference, a third proposition. If so, the science can direct the evolution of that proposition, and assign reasons both why it is evolvable, and why no others are so. (3.) While, in both cases, the reasons are ultimately traceable to the logical axioms, it can be shown, through derivative laws, that the result depends immediately on the question, whether the given terms do or do not constitute a series, related to each other both in Extension and in Comprehension.*

William Hamilton's Lectures will speedily furnish information, of which, in regard to points not a few, the students of his masterly logical system are still very much in want.

* Something, perhaps, should here be said, of the reasons which have seemed to justify the raising, in the present chapter, of questions in regard to the function and limits of logical science. Few or none of these needed to have been touched on, if it had been sufficient to regard logic exclusively from the practical side. All of them (and, it may be, others also) imperatively demand attention from those who would form a right estimate of logic as a system of speculation,—those who would know what value it has in itself as an exposition of the regulative theory of human thought.

In this country, there has never been seriously contemplated the possibility of a Logic absolutely pure or *à priori*, that is, of a system of logical science not only thoroughly demonstrative in its deductions, but not acknowledging even any data that are empirical. The possibility was broadly averred by Kant; and the endeavour was made to work it out in not a few German works, among which may be named especially those of Kiesewetter and Hoffbauer, and the symmetrically systematic treatise of Twisten. Gradually it came to be perceived, that even the ablest thinkers who had taken up this position, had not been able to proceed a step without silently assuming empirical or psychological data. Those earlier writers who exhibit-

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ed the fullest proofs of this assertion were Troxler and Bachmann. The attack on the Kantist limitation of the sphere of logic was next undertaken, on much deeper philosophical principles, by the same energetic iconoclast, of whom, not very long ago, Rosenkrantz complained, that he "had brought philosophy (that is, Hegelism) to a stand-still." In Trendelenburg's *Logische Untersuchungen* (1840), every inch of ground was cut away from under the feet of those logicians who aimed at constructing the science without presuppositions. Yet the writings of this singularly acute and learned controversialist are not the only symptoms indicating that, in Germany itself, the reaction has issued in an oscillation stretching equally far from the truth on the other side. It is not easy to see how Trendelenburg himself could frame, in consistency with his leading opinions, a positive theory of predication and inference which should be anything else than a hybrid generated between logic and metaphysics. The instructive treatise of Drobisch, also (*Neue Darstellung der Logik*, 2d edit. 1851), incorporates objective elements so freely, and brings them to bear on the formal laws of thought with such intimacy of relation, that the latter are fairly overbalanced, and the science ceases to be operative as yielding readily practical tests for explicative thought.

But Drobisch's mode of working out the details does seem not to be necessitated by his own opinion as to the function of the science. A paragraph of his preface, explaining that opinion, may serve to illustrate the position which, here and afterwards, it is endeavoured to make good in the text.

"Trendelenburg says, of the formal logic, 'that it desires to understand concept, judgment, inference, from the self-referred activity of thought; that hence it separates thinking from its object, as if the mirror which receives the light were separated from the ray which falls on it; but that such separation is hazardous, since the law of reflection is not conditioned by the mirror alone.' This view is incorrect.

"Formal logic does not presuppose a pure thinking, and does not undertake to analyse or develop the forms of such thinking in the abstract. Its presupposition is that concrete thinking which is in the most intimate union with cognition. From such thinking, the science, through abstraction, gains its fundamental forms; and then, according to the laws yielded by consideration of the relations of the forms, it connects the forms with each other, and thus reaches derivative forms. Forms without matter or content logic does not know; it knows only those forms which are independent of the special matter that may be placed in them, and for which, therefore, the matter, although it can never be dispensed with, remains indeterminate and accidental.

"The fundamental forms of thinking are gained in a manner like that which yields the fundamental forms of geometry. These are only the remainders, which abstraction leaves over from the physical and chemical properties of bodies perceived through the senses. The idea of empty space is an abstraction, foreign both to sensuous intuition and to its reproduction in memory; the geometrical surface requires a second abstraction; the line and the point require a third and a fourth. In like manner does logic arrive at the concept, its marks and its relations. But geometry is not contented either with the discovery of the fundamental forms, or with the classification of corporeal forms as presented by experience: through combination of the fundamental forms, it reaches ideal constructions, in which indeed it partly reconstructs that which is given and actual, but partly comes on formations which appear to us like strangers in the known world of sense. In a manner exactly similar—in the doctrines of judgment and inference, of divisions and proofs—does logic deal with the fundamental forms of concepts; while it allows itself to be guided by nothing but the consistency of the forms of thought with each other, the consistency of thinking with its own principles. This consistency is the only logical truth."

Of recent English works, two should be particularly referred to, as placing the function of logic on a solid and philosophical basis: to both of these more obligations than one are here due: Mr Karslake's masterly sketch, the *Aids to the Study of Logic*, book i.; "Pure Analytical Logic" (1851); and Mr Mansel's treatise, alike acute and comprehensive, the *Prolegomena Logica* (1851). Much of valuable suggestion in regard to principles is furnished also by Mr Chretien's *Essay on Logical Method* (1848). Mr Moberly's *Lectures on Logic* (1848) may be advantageously consulted for several points of special doctrine; and Mr Kidd's *Delineation of the Primary Principles of Reasoning* (1856), is exceedingly instructive, both in its original matter, and in its analytic comparison of recent logical systems.

This may be as fit a place as any, for alluding to the mathematical theories of thought, of which several have been propounded by actively thinking men, both in other days and in our own. Some of these have been content with expressing logical doctrines and rules in mathematical forms: others have insisted on seeking the foundations of logical science in principles really mathemati-

Doctrine of terms.

To the valuable German treatise just quoted from, there is annexed a "Logico-Mathematical Appendix," in which long and complex trains of reasoning are designated by algebraic symbols. The reduction of all thinking under an elaborate series of symbolic formulæ is the design of an exceedingly subtle and able work, Dr Boole's *Investigation of the Laws of Thought* (1854). In Mr De Morgan's *Formal Logic* (1847) the practical side is often approached very closely, and the pure laws of thought are developed in several of their relations with very great skill; but the principles of logic are thoroughly subordinated to those of mathematics.

All attempts to incorporate into the universal theory of thought a special and systematic development of relations of number and quantity, must be protested against with equal firmness, whichever side of the question we may look to. If the systems are to be estimated speculatively, as philosophical expositions of the laws which regulate all thinking, it must be said that they are faulty both by defect and by excess. They endeavour to theorize all thinking, by examining thought only as exerted on one kind of objects: they allege, as bearing on thought universally, laws which rule it only in certain cases. If, again, the systems are supposed to furnish rules avail-

able for practice, they must be pronounced to be both unnecessary and ineffective; and this objection lies, not only against the intrusion of mathematical principles, but also against the adoption of mathematical forms for any purpose beyond that of incidental illustration. No cumbrous scheme of exponential notation is needed, and none such is sufficient, for the actual guidance of thought when its objects are not mathematical: when its objects are so, the science of mathematics is both bound, and is the only science that is qualified, to yield the principles on which rules may be founded. The question may be considered, also, with reference to the value of logical study as a discipline of the mind. Now the mathematico-logical theories tend, one and all of them, and tend the more strongly the nearer they bring their rules towards the forms of the higher mathematics, to convert logical study into a mere cramming of the memory with formulæ, and logical practice into a mechanical manipulation of rules not known to have reasons. Even in its genuine shape, the science is, on account of its formal character, liable to both of these dangers; and the duty of its expounders is to guard against them, not, certainly, to run wilfully into their way.

Doctrine of terms.

PART FIRST.—THE DOCTRINE OF TERMS.

The signification of terms, singular and common.

24. We have already learned that, and how, the two aspects in which objects may be regarded, as individuals or as members of a class, impose on judgments and propositions the only objective modifications to which they are universally subject. The Terms through which objects are thought must be either Singulars or Universals. It remains only, in reference to terms considered as elements of judgment and predication, to place their characteristics in the position in which they are directly available as the foundation of logical rules. Here the principal question is that of the manner in which both images and concepts, and also the relations of these to each other, are denoted by words.

Singular terms call for little examination. Common terms must be scrutinized very exactly; both by reason of the difficulties they involve, and because inferences through them, being the highest formal developments of thought, are the processes whose laws constitute the highest sections of logical doctrine.

For almost all-logical purposes, it is sufficient to consider terms as the Names of Objects of Thought. Singular terms are thus names of objects thought of as individuals; common terms are the names of classes thought of as constituted by individuals or kinds of individuals. But we must always hold ourselves prepared to fall back, when it shall be necessary, on these two limiting facts:—first, that logic, both in assuming data and in working out results, has regard, not to the question whether objects are real, but only to the question whether and how they are thinkable and thought of; secondly, that terms denote objects only as thought of under some given relation.

The words which constitute terms.

25. The relations under which we can think of objects may be either comparatively simple, or indefinitely complex. Further, the expressibility of a relation in few words, or its requiring of many, may frequently be determined by circumstances extraneous to the character of the relation.¹ Therefore, a term may consist either of one word, of several, or of many. But its one word, if it has no more, or its leading word—that which expresses the most prominent idea of a group—must, admittedly, in the first place, be a noun, either substantive or adjective; and, next, it may rightly be held, that a common term does not bring out completely the concept of which it is a sign, unless its one word or leading word is specifically a noun-substantive. An adject-

tive, indeed, does often do duty as a predicate; but a substantive is required for giving easy and full expression to an idea constituting a subject. Now, a given proposition is not adequately developed, unless it has a form enabling us, without interpolation, to extricate from it all its possible results; and some of these results are not attainable unless through transposition of the terms.¹

26. We must now note, in a general way, the manner in which the singular and the common term severally signify the individual and the class.

(1.) Nouns may denote individuality in any of several ways. They may be proper names; as of persons or places: "Napoleon, Socrates; England, Edinburgh." Only it should be noted that, names of persons having long fallen short of the demand, many or most of such words are really common terms, though interpreted as singulars, through our knowledge of the circumstances in which they are used. The words, again, may be words which are strictly common terms, but whose meaning is individualized by the accompaniment of definitive descriptions: "The man whom I saw yesterday;"

The manner of signification of words constituting terms.

¹ A word or phrase which may by itself be a term, is said to be Categorematic (*κατηγορηματικόν*, to predicate); one which cannot, is Syncategorematic. By a noun is meant a noun in its nominative case: the oblique cases are excluded, with all other parts of speech. Many logicians take this distinction; that a substantive is required as subject of a proposition, but that an adjective may be logically accepted as the predicate. According, however, to the view stated in the text, such an expression as "Some men are good," is elliptical, and should, for logical treatment, be explicated into "Some men are good persons." In such fillings-up, we are doubtless exposed to the risk of limiting the predicate to a meaning narrower than the datum; but this is not difficult of avoidance. There are strong reasons for insisting on the doctrine, that substantives are the only parts of speech truly categorematic. "The predicate as predicate carries with it the mark of dependence; it does not become a free concept, till it assumes the form of substance, and may in this form become subject." (Trendelenburg, *Logische Untersuchungen*, ii. 144; see also Ritter, *Abriß der Philosophischen Logik* (1829), p. 68). When we set about bringing logically to light the relations of given terms, we are not entitled to suppose that each of our terms will continue to discharge the function it had in the proposition which gave it to us; and we are bound, in setting forth our data for logical manipulation, to give to each of their elements a form which shall bring out its character as fully as possible, and qualify it for discharging any function which any possible variety of inference can impose on it. The imperfection of the evolution which the adjective yields is exposed as soon as we attempt logical conversion. The example, as above expanded, furnishes at once the converse,—"Some good persons are men;" but, as first set down, it would not yield any intelligible converse, unless either the substantive were interpolated in the process, or the proposition thrown into one or another of those abstract shapes, which, as we shall see, are almost utterly unmanageable.

¹ Very many short or simple terms, both ordinary and technical, imply ideas which are exceedingly complex. Such terms are conventional abridgments, adopted for the acceleration of thought, as well as of speech; and they are of constant occurrence as names of objects possessing universal interest and importance. They carry with them both advantages and dangers.

Doctrine of terms. "the meadow which lies before my window;" "the argument by which you convinced me." Nor will a term be the less a singular, though the descriptive addition be by itself insufficient to indicate, or may even leave it uncertain to the speaker himself, what individual it is meant to designate. "Yonder hill," may require a gesture to determine the one hill intended; "the most profound philosopher of our age," may be a name for a person undetermined by those who use the phrase.¹

Another class of cases is more apt to be mistaken. A thing is thought of as an individual, whenever it is thought as one object, although its unity should be made up of several or many individual parts; and any given individual may itself be next thought of as a part of some other thing, which in its turn is thought of as an individual. Thus, among objects of perception, we may think successively of "that trunk, that tree, that forest:" and so, likewise, may it be for phenomena of reflective consciousness:—"The idea I have at this moment, the judgment of which that idea was an element, the course of reasoning in which that judgment was one of many steps." Examples like these, which would fall under the scholastic description of an integral whole, are not the only ones. Even the logical whole, that is, the class constituted by the individuals designated by the common term, may itself be abstractively thought of as one object. The distributive all (= each), leaves the common term as the sign of a true concept; the collective all (= all taken together), transforms it into the sign of an individual unity.²

(2.) In regard to the manner of signification in common terms there is required one remark only. Common terms are the names of classes, constituted, either immediately or through intermediate steps, by individuals, which are thought of together in respect of their possession of certain common attributes. Sometimes the term distinctly states the attribute; but, even so, the objects or substances continue to be, in speech as in thought, more prominent than the attributes. Much more frequently, and especially when the objects constituting the class are many, the common term is an arbitrary name, which briefly, but directly, denotes the class, and is applicable to each and all of the objects, while it merely implies or connotes the attributes. Indeed, both in common life and in science, it is much oftener easy, from a large combination of obvious characteristics, to place objects in a certain class and give them a conventional class-name, than to fix with strict accuracy the attributes which are essential and peculiar to the class.

The quantity of terms.

27. Out of the essential distinction between the two kinds of terms, there arises a broad distinction in the manner in which they are severally usable.

Individual objects are thinkable only as indivisible units. Consequently, a singular term can never, without altogether losing its character, denote anything less than the object of which it is at first assumed as a name.

Classes of objects, on the other hand, may be thought either in whole or in part. We may think, either of all the objects constituting the class, or only of fewer than all of those objects; and we cannot think the concept, or use the class-name, otherwise than for thinking and expressing either the one or the other of the two alternatives. A common term *may* be understood as denoting all the objects of the class; it *does*, in every proposition, denote either all or fewer than all of them.

¹ An object indicated thus indefinitely was called by the old logicians an *individuum vagum*. It was a disputed point whether the term denoting it were properly a singular, or a common term used particularly.

² See, among other explanations, that of Wallis, *Institutio Logica*, part i., cap. ii.

Doctrine of terms. A common term, when it is used to denote all the objects of the class, is said to be taken Universally, or to be *Distributed*; that is, to be spread over the whole class, or to be applied to all the objects distributively, not collectively—to each, not to all together. A common term, when it is used to denote fewer than all the objects of the class, is said to be taken Particularly, or to be *Undistributed*.

A common term, therefore, may, in a useful sense, be said to have *Quantity*; its quantity being variable, as universal or particular. It is scarcely correct, and not at all useful, to consider a singular term as having quantity. When it is said that a singular term is equivalent to a common term distributed, all that is meant is, that it does not admit of non-distribution or particularization.

We must be able, then, whenever a common term is given, either to assume or to infer whether it is distributed or undistributed. The state of the fact is, for the subject at least of a proposition, indicated in common language, by a variety of prefixed phrases. Two of these are, for convenience, used always in logic; and, it may here be observed, the signs should, for logical working, be prefixed to the predicate as well as to the subject.

28. The ordinary Signs of Distribution³ are fully interpretable for us, because the universality of terms has no degrees, and is Definite. The number of individuals contained in a class may indeed be, and almost always is, indeterminate; but, be they few or many, we do, in distributing the class-name, definitely embrace all of them under it.

All logicians adopt, as the sign of distribution in affirmative propositions, the one prefix "all" or "every." Some adopt it for negatives also; but such a use of it is apt to mislead. In the expression "All X's are Y's," the subject is understood by every one to be distributed; but in "All X's are not Y's," most persons would interpret the sign as intimating non-distribution.⁴ It is safest not to incur the risk. It may be avoided by using the prefix "any" in negation. This sign is useable without any difficulty for the predicate; and it is best to use it as a prefix for the subject also. If there is thought to be a needless awkwardness in such phrases as "Any X's are not any Y's,"⁵ we might content ourselves with an indesignate subject, and say, "The X's are not any Y's;" a form which by most hearers would be interpreted as distributing the subject, while it may, at all events, be taken in that sense by agreement.⁶

The signs of the distribution of common terms.

¹ They are such as these: "all, every, any, whatever." Both of the articles, too, are so used when joined with ampliative phrases; as, "The man (or a man) who has true self-respect, is not likely to refuse due respect to others."

² "All X's are not Y's," is naturally understood as being merely a denial of the assertion that all the X's are Y's; as equivalent to this: "It is not true that all the X's are Y's." But we are entitled to make this denial, if it be true that even "Some of the X's are not Y's," or that "There is some (or any) X which is not a Y;" and this is all the meaning we commonly attach to our "All X's are not Y's." In so interpreting it we are, as in numberless other instances, working out logical doctrines without being aware that we are doing so. "Some X's are not Y's" is logically the contradictory of "All X's are Y's," that is, a proposition necessarily inconsistent with it.

³ Ordinary language would give this arrangement:—"Not any X's are Y's;" and this again would pass into "No X's are Y's." These forms, and especially that which both displaces and incorporates the negative sign of the copula, are apt to tempt us into mistaking, for a moment, the quality of the proposition, and supposing it affirmative. The alternative afterwards proposed has the opposite fault: it conceals the quantity, and might lead us to suppose the proposition particular.

⁴ Propositions whose subject has no prefix of quantity are usually called Indefinite, more properly (Hamilton) Indesignate. The subject, if a common term, must necessarily be either distributed or undistributed; and logicians are wont to say that we cannot decide which of the two it is, until we have interpreted the terms, and considered the matter of the judgment. But, when such

Doctrine of terms.

The signs of the non-distribution of common terms.

29. The ordinary Signs of Non-distribution¹ are not fully interpretable for us. Each of them, besides directly signifying particularity, does also denote or imply some closer specification; and the particularity is the only part of their meaning that yields an idea logically available.

The only quantitative distinction with which a universal theory of thought can deal, is the all-pervading distinction between "all" on the one side, and "not-all," or "fewer-than-all," on the other; between a whole on the one side, and, on the other, something of which we can say only that it is some part or other of that whole. Accordingly, all the ordinary signs of particularity must, so far as logically cognizable, be taken as equivalents; and, for convenience, all of them are translated into the technical "some." Were it not that even one of the parts of the logical whole is enough to let in the logical "some," it would be exactly parallel to one popular phrase. Our "Some X's are Y's," were it not that it might possibly mean only "One X is Y," would be equivalent to the assertion, "There are X's which are Y's."

The true character of Logical Particularity requires to be very precisely understood. It is in all respects Indefinite.

(1.) In the common use of words, a proposition introduced by any of the limitative signs is (unless accompanied by an explanation) understood naturally and fairly as a proposition implying another. Our usual "some" means "some, but not all;" or, "some at most." If we explicitly assert that "Some are —," we are understood as implying that "Some (or many) are not —." No man asserts merely of "some" if he might assert of "all."²

The "some" of logic is equivalent to "some at least;" "some, it may or may not be all." And why? Because this is the minimum of signification bearable by any limitative sign of quantity. So much as this must be signified by each of them; so much may be assumed as involved in every assertion of the sort; and if, in a given instance, more is signified, the overplus may and should be treated as a separate proposition.³

(2.) All the ordinary signs are more or less definite in their reference upwards to the whole class: they hint at or tell of a proportion borne by the part to the whole. Some of them leave that proportion quite uncertain; others describe it vaguely; and others specify till they reach numerical determination.

The logical "some" utterly ignores such reference. This

a proposition is negative, probably no man would dream of interpreting it particularly; and even when it is affirmative, we do certainly tend to give the same interpretation. On common talk, or on oratorical or poetical effusion, it would be unreasonable to impose very severe restrictions. But in argument it would hardly be unfair to insist on interpreting universally, as against an opponent, every indesignate proposition he adduces. A reasoner who expresses particular assertions without explicit limitation, must do so either because he designs to be ambiguous, or because he thinks confusedly, or because he is (perhaps unconsciously) suppressing some step of reasoning which it would be right to force out into explicit statement. Sanderson places such assertions among his "Suppositiones," or propositions implying others; and he interprets his example as a disjunctive: "A ship is necessary for crossing the strait; that is, this, that, or the other ship is necessary." (*Logica Artis Compendium*, lib. ii., cap. 2.)

¹ Some, a few, a very few, few (= many not), a great many, not a few (= many), most, a small, large, or considerable number, a majority, a minority, a small or large proportion, nearly all, all but a few, more or less than half, &c.

² If I say, in common phrase, that "Some men are wise," I am understood to imply an opinion, that some men, or many, are not wise.

³ If I use the "some" in its logically restricted sense, and thus design to convey no implied meaning at all, I may say that "Some men are mortal;" since I know that "All men are mortal," an assertion by which mine is covered. If I were to speak with implication of the usual *anneum*, my reason for saying that "Some men are mortal" would be, that I hold some or many men not to be so.

is plain from the explanations already given. If the number of objects in a class were exactly ascertainable, our "some" would be broad enough to cover all of them but one, and narrow enough to admit one and keep out all the rest.⁴

(3.) Of the ordinary signs, some are definite, others quite indefinite, in their reference downwards towards the objects constituting the class. "Certain men (*quidam homines*)," is an example of the first kind; "Some men or other (*aliqui homines*)," belongs to the second.

The logical "some" is totally indeterminate in its reference to the constitutive objects. It is always "*aliqui*," never "*quidam*": it designates some objects or other of the class, not some certain objects definitely pointed out.⁵

Both the second rule and the third seem to grow out of a consideration which may be explained thus. By making our quantitative limitation definite in either direction, upwards or downwards, we should really have thought out a new class, constituted by so many of the objects as we had thought of or named. The common attribute of the class would be the fact that the objects are so specified by us. And all so specified by us being signified by the term (say, "some certain X's"), this term would really, paradoxical as it may appear, be a common term distributed. It would be equivalent to "all those X's I am thinking of."

² Whenever particularity is carried, though it were but by a single step, beyond, the negation of totality ("not-all"), we have passed out of the sphere of logic into that of arithmetic or mathematics. Number, it is true, is a logical *præcognitum*. But the positive ideas which logic postulates under it are only unity, plurality, and totality; and, specially, it postulates plurality only as being in thought the necessary link between unity and totality. It does not seek to develop plurality, positively, into any of those indefinitely various specifications which the repetition of the unit makes possible. When logic does aim at such development (and some very able logicians have tortured it into the task), it attempts what it cannot and need not do. It sets about performing, clumsily and imperfectly, a duty which the appropriate sciences of number and quantity execute with promptness and perfection.

So long, indeed, as the proportional specifications of particularity remain very vague, arithmetic and algebra give assistance so slight, that problems of the sort, though insoluble by pure or universal logic, are fairly and conveniently assignable to logic mixed or applied. Many such problems fall directly, or may easily be brought, within the scope of the rules given by logicians for modal propositions. Others are so easily dealt with as to require no rules beyond those of common sense. The premise "Most of the X's are Y's," evidently allows a wider inference than the premise "A few of the X's are Y's." As soon as we move on beyond such a point as this, we are, if we insist on continuing to use logical forms, doing really nothing more than throwing into logical forms results which we have gained by previous calculations, arithmetical or algebraical. This is true even of the simplest and most ingenious of all the devices of the mathematico-logicians;—Mr De Morgan's principle, called by Sir W. Hamilton the "ultra-total quantification of the middle term." The principle is this: that a half, and anything more than a half, are together in excess of the whole; and it yields a formula which merely saves us the trouble of working a simple equation, having oftentimes an indeterminate solution.

³ This third point, though implied in several of the received logical rules, has sometimes been overlooked. Surely it was so by those of the old logicians, who gave "*quidam*" as the logical sign. One or two of the Germans complicate the theory of predication needlessly, by admitting both readings.

Compare these two propositions: "Some X's are Y's;" "Some X's are not Y's." The popular "some," when unqualified, is naturally understood as indefinite; therefore common sense would lead us to say that, for all we know, both propositions may be true, but that the one or the other of them must be true. Logic, understanding the quantity of both X's as limited indefinitely, gives the same verdict. But sense and science would agree in granting a new trial, if the subject were, both times, "some certain X's." We should then have to call for evidence showing, whether the X's selected in the first proposition are the same X's which are selected in the second; or whether the two subjects designate two different sets of X's. If the sets are the same, one of the propositions must be false. If the sets are different, neither the truth nor the falsehood of the one would entitle us to infer either the falsehood or the truth of the other.

Doctrine of terms.

Doctrine of terms. Definiteness, in short, is the distinctive characteristic of universality or distribution; indefiniteness is that of particularity or non-distribution.¹

Development of the extension of common terms.

30. We must now treat, more closely than before, both of the relations, the objective and the attributive, which together constitute the totality of the concept, and of its sign the common term. Out of these will emerge by degrees one logical doctrine after another, till they yield at last their highest results in the theory of the syllogism.

The reference made by a common term to the objects thought as contained in the class, is called the *Extension*, Sphere, or Compass of the term: or, otherwise, the extension, sphere, or compass of a common term may be said to be constituted by all the objects thought as contained in the class.

In the broadest view, therefore, the extension of a common term is constituted by all the individual objects; and in any more limited view we can take, this ultimate reference to the individuals is silently implied. But the affirmation of extension by an enumeration of individuals, would be seldom (if ever) possible, and always useless. Every common term presupposes, in one view or another, several or many steps of generalization. Thus it has under it other common terms denoting contained classes of objects; while each of these may have other common terms under it; and so on, it may be, through many stages. When, therefore, common terms only are compared in respect of extension, the Extension of a Common Term is said to be constituted by all those other common terms, which are the names of classes or kinds of objects thought as included in the class denoted by it. Thus, one common term may have its extension constituted directly by several other common terms; each of which, again, has its extension constituted directly by several others: and, of course, the extension of the first covers all the extensions of all the others.

Concepts or common terms may be said to be *Ordinated in Extension*, when they are arranged in an order corresponding to the steps of generalization or specification. Ordination is most conveniently made from highest to lowest,—that is, from the one widest class, which contains all the others, down to the one or more narrowest classes, in which the data do not allow us to include any others. In respect of extension, we descend in the order of specification. The highest or most extensive term in such a series is said to be *Superordinate* to all the others; terms yielded by one and the same step of generalization or specification are *Co-ordinate*; every term lower than the highest is *Subordinate* to all terms whose extension is greater, while it is *superordinate* to all, if there are any, whose extension is less. There are used also, as descriptive of ordination in extension (not in comprehension), the names *Subalternant* and *Subalternate*; to which there should be, and sometimes is, added, the name *Co-alternate*.²

It must be noted very particularly (though the point was observed before), that, as we descend in extension we are, at every step, thinking *away* objects, but thinking *in* additional attributes; that, as we ascend in extension, we are thinking *in* objects, but thinking *away* attributes.³

¹ Consult, as to all the quantitative signs, Hamilton's *Discussions*, the Logical Appendix.

² Thus, let us, assuming terms whose meaning and relations are simple and obvious, start from the class "organized beings" as a superordinate. One step lower in specification gives us, as the two classes constituting that class, "animals" and "vegetables," which are therefore subordinate to the first class, co-ordinate with each other, superordinate to any kind we may place under either. If, neglecting the class "vegetables," we descend in a loose specification with the term "animals," it might give us the six classes, "men, beasts, birds, fishes, reptiles, insects;" and these classes would be, all of them, subordinate directly to "animal," indirectly to "organized being;" they would be co-ordinates of each other; and, if our specification stop here, they would have no subordinates.

³ Thus, our example sets out, in descent, from an indeterminate

31. The reference made by a common term to the attribute (simple or complex) thought as possessed by all the objects of the class is called the *Comprehension*, Intension, or Content of the term: or, otherwise, the intension, comprehension, or content of a common term may be said to be constituted by the attribute (simple or complex) thought as possessed by all the objects.

Doctrine of terms. Development of the comprehension of common terms.

If a term given to have its comprehension evolved, presupposes but one step of generalization, the attribute is simple, or one; and no further evolution is possible than that which is yielded by the immediate import of the name. But each additional step of generalization gives an additional element to the attribute, which thus becomes complex; and each of these steps yields a new common term, the statement of which is a step in the evolution of the comprehension of the given term. Common terms which thus evolve the comprehension of a given common term, may be said to be terms signifying attributes which are implied in the attribute given; or they signify attributes in respect of which the objects constituting the given class may be thought of as being included also in some other class or classes.

Cases yielding no possibility of evolution being excluded as barren, the Comprehension of a Common Term is said to be constituted by those common terms, which are thus significant of implied attributes. These are often, with suggestive propriety, called the *Marks* of the given term or concept.

Suppose, now, that there is given to us a series of terms ordained in extension; and that we are called on to find among these the terms which are the intensive or attributive marks of some one term of the series. In what direction shall we look?—upwards or downwards?

The attributive marks must, all of them, be possessed by all the objects of that class of which the term whose comprehension is sought is a name. Consequently, the marks of the term will not be found in any one of the terms lower or less extensive than it is; for each of these lower terms signifies some attribute, possessed, indeed, by some objects of the class we start from, but wanting to others.

The marks of a term must be sought among the terms more extensive than itself. The objects of the given class possess the attribute signified by the term whose marks we seek: they possess also some other attribute, which is possessed by other objects besides; that is, they possess also some attribute in respect of which the given objects and these others are included in another class, which accordingly is more extensive than the first. The name of this more extensive class is a mark of the given class, in so far as it signifies an attribute possessed by all the objects contained in that class.¹

but large number of beings thought of as possessing the one attribute of "organization." At our next step, whether we regard the one term or the other in the co-ordination, we have a class containing fewer objects. For "animal" and "vegetable" together are required for including all "organized beings;" and each of the two classes wants all the "organized beings" contained in the other. But, contrariwise, whichever of the two subordinate classes we contemplate, we see that its constitutive objects, though fewer than all "organized beings," possess an attribute which is not possessed by all organized beings, and is not the attribute on the thought of which the class was founded. "Animals" have the special attributes constituting "animal life;" vegetables have the special attributes constituting "vegetable life." It is needless to carry the analysis through the third stage.

The character of the ordination might be perceived from a different point of view, if we were to substitute, for each of the terms, its contradictory. "If negations are joined in thought to two concepts relatively higher and lower, there arises thus a reversal of their subordination. For, through the concept which contains the negation of a species, more objects may be thought than through those concepts which make up the negation of the genus." (Schulze, *Grundsätze der Allgemeinen Logik*, 1831, p. 54).

¹ Thus, the series of the last section does not yield any mark of the term "organized being;" no one of the lower classes signifies

Doctrine of terms. Common terms may be *Ordinated in Comprehension* as well as in extension; and it appears plainly, that the order in the one case must be exactly the reverse of that in the other. If arranged from highest to lowest, they will now stand in the order of steps in a presupposed generalization.

Again, to a series ordained in comprehension there may be applied the same set of comparative names which were applied in the former ordination:—Superordinate, Co-ordinate, Subordinate. But, while co-ordinates continue to hold the same place, the terms which before were superordinate have now become subordinate, and contrariwise.¹

It is manifest, likewise, that, terms being given as expressly ordained, either in extension or in comprehension, the other ordination is given by implication.

The law of concepts and common terms.

32. The results now gained enable us to generalize the distinctive law of concepts and common terms.

Extension and comprehension stand towards each other in an inverse ratio. By how much the more (or fewer) objects a class is thought as containing, by so much the fewer (or more) attributes are the objects thought as possessing: by how much the more (or fewer) the attributes are, by so much the fewer (or more) are the objects.

For predication through common terms this is the universal Quantitative Law. Such predication, governed primarily and qualitatively by the principle of non-contradiction, is governed secondarily, and in the way of quantitative restriction, by this law of inverse determination.

All such predication may correctly be said to be nothing more than an explication, in the form of judgments and propositions, of those relations between the terms, which are implied in a pre-formed ordination. The same assertion may be made as to inference: for inference is merely a series of predications or propositions, in which implied relations are successively and systematically evolved.

The abstractive separation of the two wholes of the concept.

33. There is one limitation, narrowing our use of the determinative law of concepts when we come to use it in predication. To this limitation our attention cannot be too early called.

The concept, that which a common term signifies, is thought as a whole, whose parts also are thinkable. It has parts both of extension and of comprehension: it has parts when it is considered in its relation to objects; it has parts when it is considered in its relation to attributes. Its totality is constituted by both kinds of parts taken together, not by either kind independently of the other.

If we are to think the concept, that is, the whole of signification of a common term, without any attempt at evolving the parts of either kind, we may and must think it as a whole whose constitution implies parts of both kinds.

But, if we desire to find the parts, or any of them—to determine what the parts are, and to think them, or any of

them, distinctly—we cannot do so in both relations at once. **Doctrine of terms.** We must seek, either to evolve the parts of the extension of the common term, leaving the comprehension unevolved as given, or to evolve the parts of the comprehension, leaving the extension unevolved as given. The complete evolution of the signification of a common term X, is a task to be performed only by the working of two problems, which must be solved separately. We must evolve the sphere, or extension, by determining what are all the kinds of X's, while we take for granted the attributes common to all the things so called; and we must evolve the comprehension, by determining what are the attributes common to all X's, while we take for granted the compass of the objects which bear the name. We must either think explicitly in extension, while we imply comprehension; or think explicitly in comprehension, while we imply extension.

While, therefore, a concept is one whole, yet, in reference to the possibility of abstractive analysis, its totality may be and by logicians frequently and conveniently is, said to be constituted by Two Wholes. A concept, or its sign the common term, is evolvable so far only as it may be regarded as involving, on the one hand, a whole of extension constituted by objects, and, on the other hand, a whole of comprehension constituted by attributes.*

* The whole of extension has often been called the "logical whole;" and the whole of comprehension has, by some of those logicians who have generalized its laws, been said to possess the character assigned, by others than logicians, to a "metaphysical whole." The names point to a distinction worth noting.

Yet the warning must be added, that they will deceive if they tempt us to infer the exclusion of comprehension from logical scrutiny. The warning is the more needed, because this aspect of the concept is by far the more difficult of the two, both for thought and for expression; and because in our logical systems the weakest point is the development of it.

So much of doctrine will hereafter be founded on the correlation of extension and comprehension, that it may be well, once for all, to bespeak close attention to the principle, and to notice generally, at the cost of a little anticipation, the historical position which the doctrine holds in the science.

Neither of the two relations of the concept could be, or ever has been, altogether overlooked. But extension, which always predominates in thought, and thus modifies all natural forms of speech, long usurped in the logical field a place almost so broad as to leave no room for comprehension. So it was with Aristotle. So, likewise, was it with the schoolmen, who held that the *totum universale*, the whole of extension, is that with which only logic has directly to do; and that the science cannot look further away from it than for seeking marks (*notæ*) by which the mutual relations of universal wholes and parts may be determined. Thus comprehension lay in the dark.

"The distinction," says Hamilton (*Discussions*, p. 641*), "as limited to the doctrine of single notions, was first signalized by the Port-Royal logicians, under the names of extension and comprehension. Leibnitz and his followers preferred the more antithetic titles of extension and intension (though intension be here somewhat deflected from its proper meaning, that of degree); and the *quantitas ambitus* and *quantitas complexus* have, among sundry other synonyms, been employed in modern times—not exclusively, for Aristotle uses *τὸ πρὸς ἕκαστον* and *τὸ πρὸς ὅλον*. The best expression, I think, for the distinction, is breadth (*Πλάτος, latitudo*), and depth (*Βάθος, profunditas*)." (See the Port-Royal *Logique*, part i., chap. vi.) Both the correlation and its law (of the inverse ratio), speedily became familiar to all logical students. "It is," says Reid, "an axiom in logic, that the more extensive any general term is, it is the less comprehensive; and, on the contrary, the more comprehensive, the less extensive." (Hamilton's *Reid*, p. 390.) But in our climate the doctrine bore no fruit.

In the *Logic* of Kant the correlation is alleged, and the law of the inverse ratio stated: the first steps also are taken towards those applications of the principle which speedily followed. Since then, it has been trite doctrine in the German schools, that a definition is a predication making distinct the comprehension of a concept; that a division is a predication making distinct the extension: and, while the German logicians have not all generalized with equal clearness the law of the inverse ratio, their success in expicating the theory of both processes has been proportional to the clearness with which they have apprehended the principle. Compare, for

any attribute possessed by all organized beings. But, as a mark either of the term "animal," or of the term "vegetable," we may assign "organization," the attribute signified by the term "organized being;" and, as a mark of "man," or any of its co-ordinates, we may assign "animal life" as a mark in the first degree, and "organization" as a mark in the second. All animals may be marked as organized beings; all men may be marked as animals and organized beings.

¹ The terms of the example in the last section would have stood thus when ordained in extension from above:—

1. Organized being; 2. Animal + vegetable; 3. Man + beast + bird + fish + reptile + insect.

The same terms ordained from above in comprehension would stand thus:—

1. Man + beast + bird + fish + reptile + insect; 2. Animal + vegetable; 3. Organized being.

When explicit ordination is required as an aid for analysis, it is safest and easiest to make it in the descending order of Extension. The counter-relations are discoverable at a glance.

Doctrine of instance, Twisten with Fries. At this point, however, the German logicians have come to a stand. With a solitary exception, none of them, so far as we know, has suspected the possibility of bringing the double relation of the concept to bear on the syllogism. The one exception is Beneke; who, however, after having seemingly grasped the principle very firmly, lets it slip out of his hands before it has yielded any generalized doctrine. (See his *Lehrbuch der Logik*, 1832, chap. viii., §§ 170, 171, 182.) It should be added that Beneke saw, very clearly, how the distribution of the predicate in affirmative propositions is necessary for the consistent development of the relation of comprehension. (See his sect. 182, foot of page 124.)

This one hesitating anticipation required in fairness to be noticed. But it leaves untouched the essential originality, as well as the whole value, of Sir William Hamilton's masterly application of the counter-wholes to the elucidation and firmer grounding of the theory of the syllogism. This deepest section of his logical system seems to have been as yet little studied. But it may not be

presumptuous to hint a belief, that his formal doctrine of the thorough-going quantification of the predicate will be found to have its chief value, and perhaps its only practical applicability, in its efficiency as an instrument for evolving the syllogistic bearings of the comprehension and extension of concepts. Some of these bearings it will be attempted by and by to explain.

Yet, further, it has to be remarked that, contemporaneously with Hamilton, two other great logicians have seized the same thought; both of them, however, grasping it from the negative side, and not working it out to any positive formal results. Professor Trendelenburg lays it down in the broadest terms, that the law of the syllogism can be understood only through the mutual relation of extension and comprehension. (*Logische Untersuchungen*, 1840, ii., pp. 232-250, § 16.) Mr Mill has a much less firm hold of the idea, mainly by reason of his avoidance of the formal point of view; but in the counter-relation of the two wholes lies the clue to the distinction which he has used so skilfully in working out his own system—that between the denotation and the connotation of terms.

PART II.—THE DOCTRINE OF PROPOSITIONS.

CHAPTER I.

The Forms of Categorical Predication.

The character of categorical predication.

34. The only kind of proposition which is the direct expression of a simple judgment, is that which is technically called the *Categorical*. From those other kinds which are usually compared with it by logicians, it may be distinguished with sufficient exactness, when it is described as being an assertion or predication, affirmative or negative, not limited either by a condition or by an alternative.¹

All categorical propositions are formally resolvable, though not all with equal ease, into three parts or factors:—The *Subject*, which is a name for that which is spoken of; the *Predicate*, which is a name for that which is said of that which is spoken of; the *Copula*, a verb, in which the assertion is expressed, and which likewise qualifies the assertion as an affirmation or a denial. The subject and predicate are called the *Terms* of the proposition.

In many common forms of speech, the copula is mixed up with the predicate: but they may always be separated; and for exact logical analysis they must be so. The pure copula is always "is" or "is not," "are" or "are not," words which, when discharging this function, do not import existence, nor even any mode of time, but merely the fact that the things thought as denoted severally by the subject and by the predicate, are thought in relation to each other.²

Propositions qualitatively resolvable into assertions of identity or difference.

35. The *Quality* of a proposition is the character of the predication it contains. As being the expression of a judgment, predication can have only the one or the other of two characters, and cannot have neither. It must be

¹ "X is Y" is a categorical proposition. Examples of the other kinds are these:—Of the Hypothetical, "If X is Y, it is Z;" of the Disjunctive, "X is either Y or Z."

² The assertion, "The world—is," passes readily into the explicit form, "The world—is—something that exists." Many other resolutions are equally easy. "John thinks," becomes "John—is—a person thinking." The first in each of these pairs of propositions would have been called, by the old logicians, a *propositio secundi adjecti* (or *adjacentis*), as having but one factor expressly adjoined to the subject; the latter would be a *propositio tertii adjecti* (or *adjacentis*), as having a second factor also expressed.

The infinitive mood is a substantive, and is most easily useable in its gerundive form; and cases where it is one of the terms are those that oftenest present the predicate before the subject. "It is pleasant to know = All knowing is a thing pleasant." The propositions which the Germans have called existential, expressible by impersonal verbs (as "it thunders, it rains"), may always be regarded as expressions of an incomplete cognition, of a thought which we either cannot analyse or have not taken the trouble to attempt analysing.

either Affirmative or Negative. The copula, which expresses the act of predication, must either want, or have, the negative sign "not."

The question of quality emerges in regard to every proposition. It is the primary question, and also the most important of all.

The doctrine to be kept steadily in view is that which has already been laid down, and in part illustrated. In the data of every proposition, there is an hypothetical presupposition of duality: two ideas are given, whose designative terms are available as subject and predicate. The proposition intimates whether, in respect of the relation under which the objects are thought, the duality can or cannot be reduced to unity. The terms having been compared, the proposition expresses the determination of the thinker on this question: whether the object or objects denoted by the subject be identical or non-identical with the object or objects denoted by the predicate. An affirmative proposition predicates the identity of subject and predicate; it does so in all circumstances. The objects are asserted to be the same objects; although, when regarded from one point of view, they bear the name given them in the subject, and, from another point of view, the name (if it be a different name) given them in the predicate. So a negative proposition predicates in all circumstances non-identity or difference; it asserts that, whatever may be the names, or whatever the points of view from which the objects are regarded, the one object, or group of objects, is a different object or group from the other.

The question of identity or difference is the main question as to all objects compared in judgment; as to certain kinds of objects it is the only question.

36. When both subject and predicate are singular terms, Predication the quality of the proposition is the only point to be considered. Especially, there can be no question as to the quantity of the terms, each of which must signify an individual object, and cannot admit any limitation to its meaning. The proposition is a pure predication of identity or non-identity. Of the individual designated by the subject there may be affirmed, as predicate, any term which is merely another name for the same individual. Of that individual there must be denied, as predicate, any and every term which is a name for any other individual.

Cases of either sort arise too infrequently, and, when they do arise, are too easily disposed of, to require special rules.

37. The question of *Quantity* arises when common terms enter into propositions, as subject, or as predicate, or as both. Common terms being capable of signifying either

The quantity of common terms.

Doctrine of all the objects of a class or less-than-all of them, the question of quantity relates to the terms. Are they distributed or undistributed?

propositions.

The answer to this question as to the terms, serves only to guard and limit the affirmation or negation made by the copula. Rigidly and rightly considered, the determination of the quantity of a term, whether through its known meaning, or through interpretation of its sign, is nothing more than a method of protection against that ambiguity, which besets common terms on account of their capability of denoting either all or less-than-all. That which is properly a term in a proposition (whether subject or predicate), is not the common term in its capability of quantitative signification, but the common term as definitely interpreted to mean all or some.

This interpretation being gained, we proceed, when both terms are common, to decide whether the objects denoted by our subject (all, or some, of the objects constituting a certain class), are, or are not, the very same objects denoted by our predicate (all, or some, of the objects constituting a certain other class).

In a word, the determination of the quantity of the terms in a proposition, is nothing else or more than a step of preparation, in cases requiring it, for the determination between identity and non-identity, and for the consequent choice between affirmation and negation.¹

The four received forms of predication through common terms.

38. In regard to quantity, the received logical doctrine and nomenclature may be set down as follows:—

Propositions whose subjects are common terms, are said to have quantity, that is, variable quantity. A proposition is said to be Universal in respect of quantity, when its subject is distributed; it is called Particular when its subject is undistributed. The quantitative sign of the subject, "all," "any," or "some," if not given, is to be supplied. A proposition whose subject is a singular term cannot receive a sign, but must be treated as a universal.

It is admitted, by all logicians, that the predicate, when it is a common term, must, like the subject, have its quantity positively determined: it must, in every proposition, be either distributed or undistributed. Ordinary language, however, does not indicate the quantity of the predicate by any prefixed signs; and, in the received logical systems, no sign is supplied. It is held that the necessity for one is superseded by a fixed rule of interpretation. The quantity of the predicate, we are told, is fixed by the quality of the proposition, without any regard to its quantity: the predicate is distributed in all negative propositions, whether universal or particular; it is undistributed in all affirmatives. The reasons assigned for the rule are these.—A negative proposition cannot but distribute the predicate; for when, of anything whatever denoted by the subject, we deny the class denoted by the predicate, we deny that the subject is to be found anywhere in the predicate-class, or makes any

part of it; or we affirm, in effect, that the subject is excluded from the whole of the predicate. On the other hand, it is allowed, that an affirmative proposition either may or may not distribute the predicate. When, of anything whatever denoted by the subject, we affirm the class denoted by the predicate, we may mean, either that the subject constitutes the whole class, or only that the subject is contained in the class, or is a part of it. In the first case the predicate is distributed; in the second it is not so. But, it is alleged, the latter case of the two is the only one with which logic can deal. The narrowest meaning which an affirmative can bear, is the assertion that the subject is a part of the predicate; so much, therefore, may always be safely assumed. If the signification of the proposition really does embrace the wider alternative, the fact is discoverable only by means lying beyond the sphere of logic, a purely formal science, which possesses no machinery for interpreting the terms, or for otherwise working on the matter of propositions.¹

Doctrine of propositions.

Accordingly, the common scheme of propositions, and the scheme of inferences founded on it, are confined to forms of predication from which affirmatives that distribute the predicate, and negatives that do not, are alike excluded.

This exclusion being made, the possible Forms of Predication, through common terms, are necessarily no more than four. For the sake of brevity in naming, those four kinds of propositions are noted by the first four vowels. The letter A denotes a universal affirmative (subject distributed, predicate undistributed); I denotes a particular affirmative (subject undistributed, predicate undistributed); E denotes a universal negative (subject distributed, predicate distributed); O denotes a particular negative (subject undistributed, predicate distributed).

The designation of propositions as universal or particular, in respect of the quantity of the subject, cannot be questioned. The four forms marked by the vowels are likewise unchallengeable.

But it has lately been questioned whether logic is either bound, or so much as entitled, to exclude all forms of predication besides the A, I, E, O. Both of the exclusions have been condemned; not only the exclusion of affirmatives which distribute the predicate, but even the exclusion of negatives whose predicate is undistributed. These points, therefore, must be more closely examined.

It has likewise been proposed, that, in the preparation of propositions for logical treatment, the signs of quantity be prefixed to predicate as well as to subject. This express signature of the quantity of the predicate is fruitful in results, to an extent which would scarcely be anticipated from an expedient so simple and so purely formal. It will be adopted in our further progress, with all examples where exact analysis is aimed at.²

¹ "All metals are minerals = All metals—are—some minerals." The terms might be held to be the two class-names "metals," "minerals;" and in this view the proposition might be described as being an assertion of partial identity between the two classes. "The whole class metals—is identical with—some part or other of the class minerals." But such an analysis is apt to cause indistinctness of thought, and that because it does not go far enough. Our terms are properly not the class-names taken without fixing of quantity, but these names as quantitatively determined by the signs; in other words, our terms here are names positively used to designate all the objects of the first class—some or other of the objects of the second. Thus regarded, the proposition is seen to be an assertion of total identity, between the objects denoted by the first name and the objects denoted by the second. "The objects which, in respect of certain properties possessed by them, and not possessed by any other objects, I call 'all metals'—are (or are the same objects with)—the objects which, in respect of certain properties possessed by them, but possessed also by other objects, I call 'some minerals.'"

² It is not to be wondered at, that the peremptory refusal to look at the meaning of the terms should be adhered to by the German logicians; among so many of whom, since the time of Kant, the purely formal or *a priori* character of logical science has been a cardinal article of faith. Yet, in not a few of the German systems of logic, the doctrine of definitions and divisions (which are admitted to be universal affirmatives distributing the predicate), is very thoroughly expounded, the case being treated as exceptional. It might surprise us more that the refusal should be insisted on so generally among English logicians; since by them the exclusion of matter from logical scrutiny has, though usually asserted as a rule, been scarcely ever traced up to principles, while it has been practically departed from in many other points of doctrine.

The express signature of predicates is a proposal of Sir William Hamilton's. Lambert, indeed (*Neues Organon*, 1764, p. 116), had invented a scheme of logical notation, in which effect was given to the quantity of every term; and Ploucquet (1761) had suggested the prefixing of the quantitative sign to the predicate in all assertions expressed for logical use. (See Fries, *System der Logik*, ed. 1837, p. 103.) But the signature of the predicate was still, by all later logicians, unadopted. Its effects are surprising. Doctrines already admitted and proved are, by means of it, made more easily expli-

Doctrines of proposi-
tions.
The eight possible forms of predication through common terms.

39. Every proposition has two alternatives of quality. Every common term has two alternatives of quantity; and the terms of every proposition are two; consequently, if quality is to have no effect, every proposition has four alternatives of quantity. If, then, we look merely to the combinations of number, the possible forms of predication must be eight.

The following formulæ exemplify these eight kinds of propositions, note the quantities, and explicate the asserted identities and differences:—

1. A. All X's are some Y's = All the X's—are identical with—some or other of the Y's.
2. I. Some X's are some Y's = Some or other of the X's—are identical with—some or other of the Y's.
3. A². All X's are all Y's = All the X's—are identical with—all the Y's.
4. I². Some X's are all Y's = Some or other of the X's—are identical with—all the Y's.
5. E. Any X's are not any Y's = All the X's—are non-identical with—all the Y's.
6. O. Some X's are not any Y's = Some or other of the X's—are non-identical with—all the Y's.
7. $\frac{1}{2}$ E. Any X's are not some Y's = All the X's—are non-identical with—some or other of the Y's.
8. $\frac{1}{2}$ O. Some X's are not some Y's = Some or other of the X's—are non-identical with—some or other of the Y's.¹

To the received scheme of predication, there would thus be added four forms, two affirmatives and two negatives. All of these express possible forms of thought; and, accordingly, admission has been demanded for all of them, as necessary for the completion of that theory of thought which logic undertakes to set forth. Admission, again, has been demanded for the affirmatives, but refused to the negatives. The grounds of both claims require examination.²

cable; other doctrines become traceable to principles which had hitherto been overlooked; and there are brought to the surface new doctrines, which had been unsuspected because the quantity of the predicate, through its want of express marks, had not been attended to unless when it bore on questions already raised.

¹ Examples in Significant Terms.

1. A. All men are imperfect = All men—are—some beings imperfect.
2. I. Some men are happy = Some men—are—some beings happy.
3. A². All men are responsible animals = All men—are—all animals responsible.
4. I². Some men are logicians = Some men—are—all logicians.
5. E. No men are stones = Any men—are not—any stones.
6. O. Some men are not wise = Some men—are not—any persons wise.
7. $\frac{1}{2}$ E. No men are some Z's = Any men—are not—some (or other) of the Z's.
8. $\frac{1}{2}$ O. Some men are not some Z's = Some men (or other)—are not—some (or other) of the Z's.

² The A² at least might have been expected to be acknowledged by some of the German logicians, who perceived so exactly the character of definitions and divisions, and were compelled to admit that these are instances of that form. But they content themselves with repeating the old declaration, that the distribution of the predicate in affirmatives, when it does occur, is "accidental"—"not cognizable from the position at which logic takes its stand." If the view be correct which will be stated in the text, it is more to be regretted that they had not given reception to I², especially since one of them has been quite aware that it is the full and only adequate converse of A. The observation is Beneke's, in a passage of his *Lehrbuch*, p. 182, which has already been referred to (note to section 33.) The only formal recognition of the distributed predicate in affirmatives, which we have observed among the German logicians, is that of Hoffbauer, who not only recognizes reciprocal propositions (A²), but lays down rules for syllogisms having both premises of that character. (*Anfangsgründe der Logik*, ed. 1810, pp. 97, 100, 185.)

In Mr George Bentham's *Outline of a New System of Logic* (1827, p. 133), all the eight possible forms are correctly set forth. But the writer instantly loses hold of the clue he had grasped: indeed, he goes so far astray as to maintain, that in negatives it is a matter of indifference whether the predicate be distributed or not.

40. More than one characteristic feature of predication may be thrown into light, if we consider every proposition as being, actually or possibly, the answer to a question. A problem is propounded in thought: a judgment is the solu-

Doctrines of proposi-
tions.

The six available forms of predication through common terms.

He ends by returning to the A, E, I, O. In Mr Solly's *Syllabus of Logic* (1839, p. 47), the eight forms are stated as arithmetically possible; and their character is shown by the prefixing of signs to the predicate. But the four added forms are at once thrown aside, as never introduced in practice. The claim for all the eight is made by Sir William Hamilton; and all of them are worked by him into his scheme of syllogisms. The admission of both quantities of predicate, with both qualities of copula, makes up his "Thorough-going quantification of the predicate." (See his *Discussions*, Appendix ii.; and Baynes' *New Analytic*.) Mr Thomson (*Laws of Thought*, 1842, 1849, 1854) rejects the additional negatives, but incorporates the additional affirmatives into his syllogistic tables. They are his U and Y. The symbols here proposed for those two affirmatives (A² and I²) seem to have some advantages. While easily pronounceable, they intimate a relation of the two forms to the received A and I; and the character of this relation is faintly hinted at, when the added forms are symbolized as higher powers of the old ones. The propriety of the two negative symbols, $\frac{1}{2}$ E and $\frac{1}{2}$ O, is a matter of very little consequence: they are to be thrown aside; and it is enough that we have brief modes of naming them in discussing the reasons for and against their reception.

In reference to Sir W. Hamilton's system, it may be well to remark, that his invaluable suggestion of always marking expressly the quantity of the predicate is one thing, that his proposed extension of the propositional forms by "thorough-going quantification" is another. In Mr Baynes' Appendix are interesting quotations from old logicians, who have contemplated the distribution of the predicate in affirmatives, and signified it by the universal sign. Instances, too, are cited, in which the bearing of this distribution on the syllogism is hinted at.

Perhaps the following passages are more decided in the application of the distributed predicate, than any of Mr Baynes' quotations. They carry us from the fourteenth century to the sixteenth; from an Englishman, the "prince of nominalists," one of the greatest of the earlier schoolmen, to a Scotsman, who has been called the last of the schoolmen, and was far from being the least subtle of the band.

In Occam's *Summa Totius Logice*, one chapter (lib. iii., cap. 13) is described in its title as showing "in what cases we may syllogize from two affirmative premises in the second figure." Two cases are described. The first is that in which the middle term is a singular. It is the second case that interests us here. "Secundus casus est, quando medius terminus sumitur cum signo universalis. Tunc semper contingit inferre conclusionem affirmativam, in qua major extremitas predicatur de minori. Bene enim sequitur: 'Omnis homo est omne risibile; Socrates est omne risibile; ergo Socrates est homo.'" "Iste autem discursus probatur per hoc: quod semper talis propositio major convertitur in unam universalem affirmativam; qua conversione facta, patet quod discursus est in prima figura, regulatus per dici de omni." The A² is here given twice. Only it is noticeable that the proposition is not considered, as it might have been, to be convertible into another A² (which would have yielded an unrecognized mood in the first figure); and hence it is that the predicate of the conclusion is undistributed. In the next paragraph the I² is, though not exemplified, unequivocally described; and it is correctly alleged to justify syllogisms with two particular premises. "Et est sciendum, quod in duobus predictis casibus non solum contingit arguere ex universalibus affirmativis; sed etiam contingit arguere ex omnibus affirmativis particularibus; et eodem modo probantur tales syllogismi ex particularibus sicut ex universalibus. . . . Et tenet talis discursus, non gratia materiæ, sed gratia formæ: quia, in omni materia, observato quod medius terminus sit terminus discretus, vel sumptus cum signo universalis in majori, discursus est bonus."

The other authority is Joannes Major (John Mair), now remembered only as an historian; who, besides teaching in Paris, was a regent, and afterwards provost, of the College of St Salvator in the Scottish University of Saint Andrews. His *Introduitorium in Aristotelicam Dialecticam*, printed at Paris in 1627, while it shows close study of Occam's doctrines, is prominently marked by the writer's characteristic independence of thought. He makes very frequent use of the distributed predicate in affirmatives. The following points are especially noticeable.

1. Instead of rejecting the form, he merely says it is uncommon: "affirmativæ prædicatum raro distribuitur." (*fol. cxlviii., col. d.*)
2. In expounding the reciprocity of deduction and induction ("deccensus" and "ascensus"), he insists on the universality of the predicate, in a collective acceptance of the sign, as a fixed datum;

Doctrine of
proposi-
tions.

tion. We ask, what is B? We answer, B is X. That which is denoted by the subject is always the *datum*; something expressible as a predicate is the *quesitum*. The subject may be called the antecedent, the predicate the consequent; and the hypothetical or conditional form of stating a proposition places the terms expressly in that relation:—"If B is B, it is X."

We have seen, already, that concepts are the only consequents yielding any positive knowledge worth having; that common terms are the only predicates yielding affirmative propositions worth expressing. Among common terms, then, our predicates are sought. We desire to affirm of our subject the name of a class. A known class will yield a predicate, if we can think that our subject makes even a part of it; and, if this is all we can think, our predicate will be undistributed. If our subject is a singular term, our affirmation cannot embrace the predicate more widely. The individual denoted by it can be only one or another of the objects which constitute the class indicated in our predicate.

But, if our subject is a common term, the objects it denotes may be either some, or all, of the things constituting a class denoted by another common term; or, again, they may not be any of the things constituting that class. Thus there arise three cases, all of them possible, actual, and more or less frequent.

First, We may be entitled to think of the objects denoted by the subject as being only some, not more, or to think of them as being certainly some, though we do not know whether they are or are not all, of the things denotable by the predicate. Either state of our knowledge will yield an affirmative predication, having the character of the affirmatives in the received list. It will be an affirmative with an undistributed predicate, an A or an I, as the subject is distributed or undistributed. Such propositions may conveniently be called Propositions of Inclusion: they assert only that the subject is included in the class which yields the predicate.

Propositions of inclusion make up a very large majority of the affirmatives that actually occur; and perhaps they are, without exception, the only affirmatives which we ever use exhaustively as data, unless when, as in scientific discussions, we reason from definitions.

Secondly, however, there do occur also affirmatives which may be called Propositions of Constitution. In these, the things denoted by the subject are thought of as being all the things denotable by the predicate: they are asserted to constitute the class of which the predicate is a name. The propositions are affirmatives with distributed predicates.

"constantia est hæc propositio: isti pomæ sunt omnes pomæ. . . . istæ arbores sunt omnes arbores." (fol. cxliii., a, b.) 3. He indorses Occam's verdict on the second figure, lays down a principle for protection against resulting fallacies, and assigns a practical reason for the limitations assumed in the received syllogistic rules. "Dicces forte, hæc consequentia est bona: 'omnis homo omne animal est; et omnis asinus est animal: ergo omnis asinus est homo.' . . . Respondetur in uno verbo. Ubi a mendis, ratione quorum regulæ sunt traditæ, præcavetur, majore particulari aut utraque præmissarum affirmativa, discursus in hac figura, sicut in aliis, est formalis. . . . Primi regularum traditores de propositionibus communiter consuetis loquuti sunt; hoc est, de affirmativa cum prædicato distribubili non distributo, et de negativa cum prædicato distributo." (fol. civi., c.) 4. Afterwards he deals similarly with the third figure. (fol. clviii. b.)

It may be noted, also, that both of those dialecticians treat, and Occam very diffusely, a current scholastic distinction which appears in one of Mr Baynes' quotations. The "suppositio" of terms in propositions (that is, their objective reference), was said to be of two kinds, "determinata" and "confusa;" the latter, again, being either "confusa tantum" or "confusa et distributa." The complexity and vacillation of the old rules of "suppositio" seem to have sprung from two sources: an indistinct apprehension of the effect which non-distribution of the predicate has on affirmation; and a frequent attempt to identify singular terms with common terms undistributed.

Universal propositions of this type, the A² of our formulæ, Doctrine of are exemplified by definitions, and also by logical divisions. propositions. Particular propositions of the kind, the I² of our formulæ—particular propositions which are interpreted imperfectly unless the predicate is held to be distributed—occur more frequently than we are apt to suppose. We shall encounter them, by and by, as being really the only complete and direct converses of the A of the received scheme.

Propositions really treatable as A² and I², have been currently handled by logicians, and are very frequent in ordinary thought. They are technically spoken of as exclusive propositions: "Men are the only responsible animals." They are usually treated as compound. The example is resolved into these two assertions:—1. "Men are responsible animals;" that is, they are some at least of the class; the question, whether they are the whole class, being supposed to be in the first instance undecided: 2. "Creatures which are not responsible animals are not men." But, if we allow distribution of the predicate, the proposition is interpretable as expressing one simple judgment: "All men—are—all responsible animals."¹

When, therefore, the purpose is to predicate a relation between the subject and a class, there are data for affirmation, first, when we are able to assert inclusion; secondly, when we are able to assert constitution.

Thirdly, The same purpose being entertained, we have data for negation, when we are able to assert exclusion. A Proposition of Exclusion is one which asserts that the things denoted by the subject are excluded from the class denoted by the predicate; that, in other words, they do not make any part of that class, or that they are non-identical with all the things which that class contains. Evidently such propositions have the predicate distributed. They are the E and O of the received scheme.

They are not only of continual occurrence, but widely useful. In every kind of inquiry, we are able to deny a great deal more than we are able to affirm; and a denial which entitles us to set aside a whole class of things as being not the things we are interested in, is often one of the most valuable of all steps towards our learning what the things we investigate positively are.

41. When we desire to explicate our implied knowledge The two by referring our objects to a class, the three judgments ex- non-avail- pressible by the three kinds of propositions which have now- able forms been explained, appear to be all the judgments that can tion of predica- either constitute positive knowledge, or be steps leading through tion towards it. We must assert either inclusion, by A or I; common or constitution, by A² or I²; or total exclusion, by E or O. terms.

Propositions having the character of our seventh and eighth formulæ, $\frac{1}{2}$ E and $\frac{1}{2}$ O, do not seem to occur at all. Can there be detected, in actual thought, any examples of

¹ For the only uses to which it is here intended to apply either A² or I², it is scarcely necessary to raise a question, which, however, would require consideration if these forms were to be worked up into additional syllogistic moods. The "all" of the received A is distributive. Can it be so in these added forms? or, is it necessarily collective? Sir William Hamilton declares incidentally that the totality may be thought either way. "We can say, as we think, affirmatively, 'All triangles are all trilaterals.' This collectively, 'the whole (or class) triangle is the whole (or class) trilateral.' This distributively, 'every (or each several) triangle is every (or each several) trilateral.'" (*Discussions*, Appendix ii., p. 627.) It is difficult to see one's way clearly through the distributive interpretation. Perhaps it may be justified thus:—Let the given proposition be, "All X's are all Y's." Collectively taken, the assertion is, that the aggregate of the X's is the same with the aggregate of the Y's; that is, the whole class X is the same with the whole class Y. Distributively taken, it may be regarded through the names:—each of the things which, when viewed from a certain point, we call X, would, when viewed from another point, be each of the things we call Y.

Doctrine of negatives, whose predicate, when its true function is brought to light, proves to be undistributed? One should not expect to find such. They could not serve any conceivable use, either as data for inference, or as conclusions to be inferred. We know, or are on the way towards knowing, when we are able to assert, either that our subject is *in* a class, or that it *constitutes* a class, or that it is *out of* a class. But the propositions in question do not assert any of these three things. They assert, not knowledge, but doubt: and the doubt which they do assert does not cover any the tiniest germ of knowledge, in regard to the objects from which we started,—those which are denoted by the subject, and which we wish to determine, positively or negatively, through the predicate.

In the formation of an opinion in regard to them, the indefinite character of logical particularity must be kept sternly in view. If the logical "some" were definite, those negatives would be virtually the received E and O. They would assert the exclusion of the subject, not, indeed, from the whole class denoted by the term which is formally the predicate, but from a certain fixed part of that class, which part would really be a sub-class, and ought to yield a name which would be the true predicate. But the logical "some" is, and must be, indefinite; and it is on this footing that the propositions have been placed, when they are asserted to be forms of thought, the analysis of which ought to have a place in logic.

Whenever the subject of a proposition is indeterminate in quantity, because particular (as "some or other of the X's"), we have a very narrow field both for predication and for inference. The defect, however, is often unavoidable. The subject is our datum; it is the name of that which is given us to be judged of. But, be our subject quantitatively determinate or not ("all" or "some"), we seek for it a predicate which shall force us to assert, on pain of self-contradiction, the identity or non-identity of the objects denoted by the subject with objects denoted by the predicate. A predicate quantitatively undetermined by being particular, will yield an affirmation, A or I. In judging that "The X's (all or some) are some or other of the Y's," we have found for our subject a positive place in the field of our knowledge,—a place somewhere among the objects we call Y's: we have identified our subject with some or other of the Y's; and we are put on the track towards discovering its place still more exactly, through subsequent scrutiny of the Y's. But, if we must judge negatively, an undistributed predicate does not fix the place of our subject anywhere, either among or not among the objects we already know. The assertion that the X's (all or some) are not some or other of the Y's, does not contradict either the assertion that our given X's are things different from all the Y's, or the assertion that they are identical with some things or other lying in those parts of the sphere of the Y's, which our given predicate must have left unfilled. In a word, our proposition is nothing better than an involved expression for a barren alternative. Our X's, we learn, either are Y's, or they are not Y's; which is no more than what we know to be true, by the axiom of determination, in regard to any term whatever in its relation to any other.

It is well, then, that propositions having this character should be recognized as expressing possible forms of thought; it is well that we should know every garb, in which even doubt and ignorance may clothe themselves. But there does not appear to be any sufficient reason for complicating the rules either of inference or of predication, by extending them to forms which yield no real explanation of any given thought. Certainly such a proposition is never given to be inferred from. If such a proposition is the only one that can be inferred from an-

other, the fact is a significant testimony to the poverty of the datum.¹

42. Our scrutiny of the eight possible forms of predication leads to this result.

The four forms of the schools retain their place without challenge from any quarter; and doctrines bearing on them must always constitute the main part in the logical theory both of predication and of inference. Our chief duty must be the development of them: of the two affirmatives, A and I, propositions of inclusion; of the two negatives, E and O, propositions of exclusion.

But there do not seem to be good reasons for absolutely refusing a place in the logical system to propositions of constitution—the affirmatives which have been marked as A² and I². When an affirmation in which the predicate is distributed occurs in actual reasoning, we cannot apply to it rules which suppose its predicate to be undistributed, without the risk of either contracting unduly the limits of inference from it, or admitting wrongly the validity of inferences through which it may have been gained.

The latter of the dangers is probably the more imminent of the two. The increase in the power of inference through distribution of the predicate proves, on narrow inspection, to be by no means so large as we might expect it to be. Besides this, neither of the added forms can actually occur in reasoning, as data or premises, unless in the way of exception, and in circumstances making it easy for any one familiar with logical principles to apply the necessary correction to the conclusion. At all events, no attempt will here be made to work these forms, as premises, into the received scheme of the categorical syllogism.

But they should and will be used, as materials of great value for fortifying some weak points of the current logical system. Definitions and divisions cannot be thoroughly understood, unless through the A². Disjunctive propositions rest wholly on it. The I², again, is imperatively required for giving consistency and completeness to the theory of conversion; and through this process it has bearings on the syllogism.

If the current objection is urged, that the mere form of an affirmative does not enable us to know whether the predicate actually is distributed or not, the answer is not far to seek. It is true that we are not, *qua* logicians, able to interpret our terms, far less to decide the question of truth or falsehood for any one proposition considered by itself. But, even when one proposition only is given, we are entitled, before we undertake dealing with it, to demand, from without, all the information required for enabling us to apply logical laws.

The information we do demand is not extensive. It is wholly embraced in the two postulates laid down in our preliminary inquiries. We ask to be informed, in regard to every term given, whether it is to be understood as a singular or as a common term. If it has the latter meaning, we ask to be informed whether it is distributed or undistributed. For negatives, the information comes of itself. For affirmatives, we are entitled to summon it. If such a proposition is really either an A² or an I², we have a right to require warning of the fact. If, on the other hand, we evolve either form for ourselves, we are equally well entitled to make the peculiarity clear, by prefixing of the quantitative sign to the predicate.

43. All predication is reducible into categorical forms; and, as it has already been alleged, every categorical predication may be dissected into the three constitutive factors of the proposition,—Subject, Predicate, and Copula. A

¹ See Note First at the end of the chapter.

The special uses of propositions of constitution.

The interpretation of propositions.

Doctrine of propositions. Doctrine of propositions.

proposition is not naturalized in our realm,—it has neither acquired logical privileges, nor become fully amenable to logical laws,—until it has submitted itself to both steps of this transformation, and has completed its legitimation by obedience to the postulates.

Such a process of preparation, while it lies beyond the function of pure logic, pre-supposes, likewise, interpretation of the terms; a duty which is still more distant from ours, and which can seldom be performed efficiently without a scrutiny, utterly extra-logical, of the truth or falsehood of the given assertions.

But, in a system of applied logic, an introductory section might, fitly and advantageously, be employed in such an analysis of the ordinary forms of predication, as should exhibit their relations to the logical forms, and found rules or aids both for interpretation and for transformation. Even for the design here entertained, some such assistance may advisably be offered; although it cannot, and need not, embrace any modes of expression except a few of those which are likely to prove most troublesome in elementary logical study. Assertions made for purposes other than logical, do seldom wear a shape fitting them for logical use; and we may warrantably turn aside for a little, to examine some of the most common varieties of predication, and to discover, if we can, in what way, and how far, they may be made available as elements of inference. A few hints to this effect are thrown into the second of the notes appended to the present chapter.

NOTE I.

Sir W. Hamilton's Partial Negatives.

Our seventh and eighth propositions, marked as $\frac{1}{2}E$ and $\frac{1}{2}O$, are the new and peculiar forms of predication in Sir William Hamilton's system: they are his Partial Negatives, Toto-partial and Parti-partial. Forms so authoritatively recommended cannot be so much as questioned, without a painful distrust in one's own judgment; nor can they be set aside but with reluctance and hesitation, even if the ground of dissent should seem to be very firm. It is right that the argument should be stated more precisely than in the text; although the points cannot be brought out without assuming doctrines which have to be explained afterwards.

1. It is alleged, in the text, that the propositions $\frac{1}{2}E$ and $\frac{1}{2}O$ leave open the universally prevailing alternative of the excluded middle: "Our given X's either are or are not Y's." The quantity of the subject being here indifferent, let the universal proposition $\frac{1}{2}E$ be taken for illustration: "The X's (any X's) are not some or other of the Y's." (1.) This is not inconsistent with the assertion (A) that "All the X's are some or other of the Y's:" for, though the X's are not some or other undetermined Y's, they may be some other Y's also undetermined. I may say that "Men are not some or other of the objects we call imperfect beings," without contradicting the true assertion, that "Men are some or other of those beings." I may say that men are not to be found in some undetermined part of the class of imperfect beings, although I know that men are to be found in some other undetermined part of the class. (2.) The proposition is not inconsistent with the assertion (E) that "None of the X's are any of the Y's:" indeed, the assertion that "The X's are not some undetermined Y's," is implied in the assertion that "The X's are not any Y's:" it is a clumsy subalternate. If I choose to assert, "Men are not some or other of the objects we call stones," I assert a part of the wider truth, that "Men are not any of those objects." The assertion that men are not in some undetermined part of the class, is covered by the assertion that men are not in any part of the class. (3.) Accordingly, our proposition is consistent both with the proposition of inclusion, "All the X's are Y's," and with the proposition of exclusion, "The X's (any) are not Y's." It leaves untouched the disjunctive proposition, "The X's are either Y's or not Y's." This proposition collects the whole of our positive knowledge of the X's; and that knowledge is really no knowledge at all. Anything whatever must be either Y or not Y; so therefore, of course, must our X's be. (4.) We may regard the proposition as a fact of naming. The question then is this: Is our predicate a name which may be given to the things for which our subject is another name? May the things which, looking at them in respect of certain of their attributes, we call X's, be also called

Y's, in respect of certain other attributes? The question cannot be answered. Our predicate Y may be a name, both for our X's and for other things; or it may not be a name for any of our X's.

2. It appears, then, that of the three kinds of propositions which have, in the text, been asserted to be the only ones available for the explication of implied knowledge, there are two towards which the propositions in question are indifferent. Such a proposition is consistent with a proposition of inclusion: it is consistent with a proposition of exclusion. Now these two are the only kinds of propositions taken account of in the received logical systems. Therefore, if a proposition were given in either of the two new forms, we could not, with the same subject and predicate discharging the same functions, evolve, for the application of the common rules, either an affirmative (A or I), or a negative (E or O).

3. It must be allowed, however, that our propositions do give us hold of a predication of one sort. They are inconsistent with our third kind of propositions, those of constitution. If it is true that our X's are not some or other of the Y's, it cannot be true that they are all the Y's: since the X's are different things from some Y's or other, they cannot be identical with all the Y's. If, then, we assert, in our new forms, that "The X's (any or some) are not some Y's," we cannot, without self-contradiction, assert that "The X's (all or some) are all the Y's." Therefore, $\frac{1}{2}E$ and $\frac{1}{2}O$ severally contradict our A² and I². If we are to gain an expression for the contradictory thus implied, and if we are still to adhere to our given subject as subject, we evolve such an assertion as this: "The X's (all or some) either are not Y's, or, if they are Y's, they are not the only Y's." We are still forced into the disjunctive proposition, if we are to express all that our relation implies. But the positive member of our alternative has now received a negative limitation; and in this limitation lies the only force of our proposition as an element of knowledge.

4. It has such a force. For there is extricable, from our newly-gained disjunctive, a proposition in a received form, which, while it leaves open the A and I like our datum, does also like it contradict categorically the A² or I². It is expressible so as to cover both of the challenged forms: "There are Y's which are not our X's = Some Y's or other—are not—our X's." (1.) If our given proposition was "Some X's are not some Y's," our evolved proposition is, "Some Y's are not some X's." This assertion fulfils the conditions above alleged; but, being a re-emergence of the challengeable form, it may be passed over. (2.) If our given proposition was, "The X's (any X's) are not some Y's," the evolved proposition is, "Some Y's are not any X's." This proposition calls for particular examination. In the first place, it is not inconsistent with the assertion that "All X's are some Y's" (A). It is true that "Some men are not (any) sages;" though it is also true that "All sages are (some) men." Secondly, it is not inconsistent with the assertion that "No X's are any Y's" (E): indeed, the assertion that "Some stones are not (any) men," might be worked out of the assertion that "No men are (any) stones." Further, it is plainly inconsistent with the assertion that "All the X's are all the Y's" (A²): and thus it is also inconsistent with the I². If there are any Y's besides the X's, we cannot say, consistently, that the X's, or some of them, comprehend all the Y's. Lastly, the proposition we have thus gained is in one of the received forms: it is an O, a particular negative with distributed predicate.

5. Our extricated proposition, then, is a proposition of exclusion, a workable assertion of non-identity. But mark how it stands relatively to the point from which we started. Our terms have exchanged functions. Our subject has become predicate; our predicate has become subject. Our given subject, that term which was proposed for determination, was "the X's;" we sought to determine that term negatively through the term "some Y's." We failed in the attempt: we have failed even now. What we have been able to do is, not to determine X through Y, but to determine Y through X. We have asserted, in our new proposition, nothing about X as subject: we have asserted something about Y, shelving X into the office of predicate. In short, when we endeavoured to use the proposition as given, we discovered that we had grasped it by the wrong handle: when thus treated it slipped away from us. We have next seized it from the opposite side; and now our hold is firm.

6. Technically described, our change of position has been this: we have Converted the given proposition. Our O fulfils all the logical conditions of a valid converse. We were unable to extricate from our datum, either by affirmation or by negation, any determination as to our subject through our predicate. But conversion has yielded us a negative determination of our predicate through our subject.

7. If, then, it were conceivable that there should be actually given a proposition in the seventh form, our only feasible method of procedure would be founded on the theory, that our datum is a product of perplexed and mistaken thought. In form denying the

Doctrine of propositions. predicate of the subject, but not really amounting to such a denial, it does really imply an assertion in which the subject is denied of the predicate. Any one who should think in such a form, must, we would assume, have mistaken the substance for the attribute; and contrariwise. We should have to evolve the positive thought, and make it distinct, by transposing the terms. If such an expedient is not proposed in the text, it is because it does not seem to be the fact, that confusion of thought ever does show itself in this out-of-the-way guise.

8. The strongest claim of the seventh form to admission into the syllogistic system, rests on this relation between the proposition and its converse. But the claim takes the case from the side opposite to that on which we have hitherto looked at it.

It is a received and unchallengeable logical doctrine, that, all negatives being held to distribute the predicate, the O of the common scheme does not admit conversion into any proposition of that scheme: (its conversion by contraposition is really a conversion, not of the O, but of an I inferred from it). In a just conversion, while the quality of the proposition must remain unchanged, the terms must be transposed as wholes, quantity included. Given, then, "Some X's—are not—any Y's" (O); the subject "Some X's" cannot do duty as predicate. The impossibility of directly converting O, cripples seriously our dealing with two of the syllogistic moods, Baroco and Bocardo.

If our seventh form be admitted, it gives instant relief. It yields a converse of O: "Any Y's—are not—some X's." All the four kinds of propositions are now convertible; and the two formidable syllogisms are lowered from their bad eminence.

9. The question is, what has been gained by this transformation of the O? Why, we have displaced an assertion expressing a pregnant, though narrow thought, and have erected in its place the expression of an empty shadow of thinking. We had received a negative determination of our limited subject; we have transformed it into a total want of determination of our more extensive predicate. We have been allowed to start from a judgment which, though the narrowest that is knowledge at all, is yet, within its small bounds, a knowledge precise and usable: we have wilfully thrown ourselves back into a position of pure doubt, a position from which we cannot rise unless by returning to the very point we had deserted.

10. The particular negative (O) of the received doctrine is the weakest of all possible judgments. The relation which it asserts is the narrowest that can yield any knowledge whatever: the amount of inference it allows is smaller than that given by any other proposition. One of the most telling proofs of its feebleness is the fact that, while it does deny something of the subject, it does not really either affirm or deny anything categorically of the predicate. The old logicians have recognised this fact, in pronouncing the O to be inconvertible: and, in the face of the temptation held out by a dazzling promise of increase in the forms of predication, the belief forces itself on us, that the old logicians were in the right.

11. One other query may be hazarded, bearing on that thorough extrication of the two wholes of the concept, the application of which to the theory of the syllogism is so admirable and original a feature in Sir W. Hamilton's system. Sufficient data being supplied, as they are in the premises of a syllogism, we ought to be able to determine, as to each of the three syllogistic propositions, in which of the two wholes it predicates. E and O are easily dealt with as propositions of inclusion, when the contradictory of the predicate is taken as the class. But how as to $\frac{1}{2}$ E or $\frac{1}{2}$ O, if these present themselves? Are they in any way thinkable, as predication either in extension or in comprehension?

NOTE II.

Hints for the Interpretation of Propositions.

I. When forms of expression, designed for the excitement of imagination or emotion, are to be logically used, they must either be translated into assertions expressive of pure thought; or, if any of the ideas denoted cannot be so translated, these must be neglected, as not logically cognizable. Thus, all figurative phrases must be brought within our grasp by direct assertion of the relation they imply: "All flesh is grass," finds its equivalent in "Man is as fading as grass." Exclamations, again, are assertions intensified in meaning through indications of emotion. The emotive or intensive phrase may be made logically available when it is not a sign of quantity, but not when it is: "How miserable are some men!" is fairly interpretable into "Some men are very miserable;" "How many men are miserable!" cannot find a direct equivalent. Again, assertions made passionately, fall often, both in oratory and in common speech, into the form of question: the Interrogation is the favourite figure of Demosthenes. The assertion extricable is the answer; the quality of which is opposed to that of the question.

II. When we pass to assertions which may be taken to be already expressions of pure thinking, the first point that arises is the character of the *Copula*, raising the question of Modality. Pure categoricals are such as have been considered in the text. Modals have, as a copula, not the verb "to be" by itself, but this with some phrase which adds to or restricts its meaning. There seems to be no reason for questioning the sentence which excludes modals from logical treatment; but they are often interpretable into a shape which gives effect to the modal element, through its incorporation into one of the terms.

1. Treated in the most systematic way, modality is of three kinds, giving Kant's Judgments Problematical, Assertory, and Apodeictic (or Demonstrative). These are founded on the relations of possibility, reality, and necessity, and are expressible in the copula (affirmatively) by "may be," "is," and "must be." When considered psychologically and metaphysically, these varieties of thought are very important. In this view, "may be" is an expression, not of knowledge, but of a doubt which may or may not lead to knowledge. The imperative "must," on the other hand, seems to give voice to the only form, in which we can directly think the necessity attending our immediate cognition of *a priori* truths. That necessity cannot pass into the form of universality through "all," until we have both represented the primitive cognition, and determined, rightly or wrongly, the sphere in which the law works. When this step has been taken, the "must" becomes quantitative; and the copula may be "is." Now, unless when the method next to be noticed is accessible, the hint just thrown out appears to indicate the only manner in which the threefold modality can be regarded as bearing on pure categorical predication. The "is" being accepted as the copula, the "must," when interpretable at all under this condition, signifies the universality of the subject; the "may be" its particularity. "Body must occupy space;" that is, "All bodies occupy space." "Body may be visible;" that is, "Some bodies are visible, some (as gases) are not."

2. Modality is frequently constituted by qualifying phrases, which (as is often true also of the "must," and "may") are easily transferable from copula to predicate. "John—is probably—dead," becomes pure as "John—is—a person probably dead;" and this transformation of the proposition would commonly, though not invariably, fit it for use in a given case.

3. The most stubborn kind of modality is made by the element of *time*, which often resists successfully all attempts at displacement. The logical copula merely connects subject and predicate, on the hypothesis that both denote objects which do or may exist. "X is Y" has logically no more meaning than this: "If X is, and if Y is, X is Y." Even our "is," because suggesting the idea of time, is not theoretically perfect as a symbol of the relation between the terms: there is a strong temptation (which must be resisted for avoidance of counterbalancing evils) to the substitution for it of mathematical signs like the =. But, when an assertion is made as to the past (and the same thing might be said of the future), we cannot, by any exertion, shake out the actuality which clings to the root of it. Allegations of historical facts cannot become pure categoricals, without destruction of their essential import. The truth is, that narrative propositions, *qua* allegations of past individual facts, are not adequate data for reasoning that embraces classes of objects and their laws. Nor are they really so used. The simplest general reflection that can insinuate itself into the body of a history, will, if founded on an incident or characteristic appearing in the story, be found to have silently transformed the individual fact into an instance exemplifying some principle, holding for all time, and expressible, though not expressed, in pure categorical form. When, in historical writing, an inference is drawn from one individual fact to another, it might be logically tested in a fashion which, though of the roughest, and involving inquiries extra-logical, may sometimes be useful. It will, in particular, save needless trouble, when we encounter an argument in which the copula does not always appear in the same tense. Let us ask ourselves, after having examined the matter of the propositions, whether the change of time is essential or inessential to the mutual relations of the terms. If it is inessential, we may shut our eyes to the discrepancy. The test is stood successfully by such an argument as this: "Sages deserve fame (that is, always); Socrates was a sage: therefore Socrates deserved fame (or even Socrates deserves it)."

III. In a third class of propositions, the difficulty arises from the *Terms*. Each proposition of this class is resolvable into more propositions than one; though it is a question, to be answered only from scrutiny of the use the assertion is put to in a given case, whether it is to be so resolved, or to be treated as one assertion. Such propositions are describable by old names, as "*propositiones compositae*," or compound; or as "*expansiones*," in respect of their

Doctrine of susceptibility of analysis; and some of them have, by certain logicians, been regarded as a species of modals.

propositions.

All such forms are instances of the abbreviations to which language has recourse, in its vain endeavour to keep pace with the rapidity of thought. The varieties are as indefinitely numerous as the kinds of the occasions. The following are a few of those which occur most frequently in immediate relation to trains of reasoning:—

1. A Hypothetical proposition is the condensed expression of an inference, without categorical assertion of the premise: "If X is Y, Y is Z." The propositions called Inferential and Causal have the same import, with this difference, that they categorically assert the premise, sometimes through a participle: "X is Y, therefore Y is Z: Y is Z because X is Y: X, being Y, is Z." If the inferential relation appears on the face of the compound proposition, it may be dealt with logically: if it does not, if it merely asserts the connection of two facts not formally related through a law of thought, the relation lies beyond the logical sphere.

2. A Disjunctive proposition, if affirmative, is equivalent to the assertion that one or another of two or more categorical propositions is true: "A is either X, or Y, or Z: either X, or Y, or Z, is A." If negative, it denies each of the alternatives: "A is neither X, nor Y, nor Z: neither X, nor Y, nor Z, is A."

Both hypotheticals and disjunctives will have to be treated more closely in a further stage of our progress.

3. The propositions oftenest called Copulatives are categorical affirmatives, in which either term, or both, are resolvable into simpler terms, co-ordinates of each other: "A is X, and Y, and Z: X, and Y, and Z, are A." If the terms are common terms, A may be the name of a class, X, Y, and Z the names of sub-classes constituting it; and in this case the proposition is treatable as an equivalent of the affirmative disjunctive. Such a proposition is an A². Very frequently this analysis is inapplicable: "Honesty and industry are virtues: industry is commendable and self-rewarding." But an assertion having the same form is often, in reality, one assertion only, the complex term being taken collectively: "Honesty and industry give promise of success;" that is, all combinations of honesty and industry give such promise.

4. Exclusive propositions are marked by such phrases as "only," connected with the predicate, and always (if we mistake not) truly referable to it: "All X's (or some X's) are the only Y's."

It has already been observed that, in making affirmative assertions of this sort, we really bring into actual use the questioned forms A² and I²; and it has been pointed out, likewise, that another proposition may be held as implied. The full expression of the thought, in this view, gives these two predications: (1.) "All (or some) X's are some Y's:" (2.) "Things which are not Y's are not X's."

A proposition exclusive by negation would be such as this: "The X's (or some X's) are not the only Y's." Such an assertion is not expressible by one proposition, in any of the eight forms of predication: it is not so even by $\frac{1}{2}I$ or $\frac{1}{2}O$, unless the "some" of the predicate were to be interpreted definitely. Its whole signification is reachable only through analysis into its two factors: (1.) "All (or some) X's are some Y's:" (2.) "Some Y's are not any X's."

5. Exceptive propositions are marked, in the subject, by phrases like "but, except, unless, besides," which are equivalents of "not;" while "only," too, has certainly an exceptive force (of negation) when joined with the subject.

Accordingly, the affirmation "All objects besides the X's are Y's," is directly equivalent to the affirmation, "All objects which are not X's are some Y's (= All Not-X's are Y's)." But it presupposes or implies also the negation: "The X's are not any objects which are Not-Y's (= The X's are not Not-Y's)." So the negation, "No objects but the X's are Y's," is exponible into the expressed negation, "No objects not X's are any Y's," and the implied affirmation, "All the X's are some Y's."

When either exclusive propositions or exceptives appear in a chain of reasoning, it will almost always be found, that the expressed factor is that for the sake of which the allegation is introduced, and that no use is made of the implied one. But the implication requires to be remembered, in case of its emerging so as to cause a fallacy; and confused thinking may be made still more confused, through these or any other of the complex kinds of propositions.

6. A Comparative proposition presupposes another, with which it might stand undissected. The assertion that "Washington was a greater man than Napoleon," assumes that "Napoleon was a great man."

7. Restrictive propositions are not always analysable on the same principle. Sometimes such a proposition is, even in the shape in which it is given, a true and simple categorical, having a term which denotes (perhaps not so neatly as might be) a very complex idea. Often,—as in the case of the "reduplicative" of the schoolmen,—it is virtually an inference. "Man, so far as he is an ani-

mal, is mortal," seems fairly interpretable into "Man, being an animal, is mortal;" and this, again, is a causal proposition.

IV. Sometimes there insinuate themselves into reasoning, assertions of a kind, which it is not difficult to dispose of when their true character is understood. Their distinctive feature is not condensation, but expansion. They are best illustrated by propositions usually called Adversative, which assert, in any of several ways, a contrariety between one proposition and another.

1. The reason for adoption of the adversative form is frequently the desire to use that excitative power over imagination and feeling, which is possessed by the antithesis. In such a case, it will seldom be possible to determine the logical bearing of the proposition, until it has been thrown into another shape; and the choice may lie between any of several shapes, one of which only will exhibit the intended function of the proposition as a step of inference. Thus, if a proposition like this were to find its way into argument: "Life is short, but art is long," it would probably have to be interpreted as meaning, either that life is too short for the mastery of art; or that the complete study of art is too arduous for one short human life.

2. The adversative factor of the proposition may be merely explanatory or limitative. It may have been introduced in order to make it quite clear, either that certain cases are excluded from the scope of the principal assertion, or that certain cases are included in it. The context ought to show plainly, which of the two factors is the assertion founded on in the reasoning, and which is a mere gloss not entering into the argument at all.

CHAPTER II.

The Laws of Categorical Predication through Common Terms.

44. Let two terms be given, with the postulated explanation; and, the question of inference being postponed, let it be required only to predicate or form propositions with terms singular and common. Logic can work the problem no further, than by exhibiting all the propositional forms in which it is possible to combine the terms, whether affirmatively or negatively. Which of the propositions, if any, would be true in respect of the relation between the objects signified by the terms, or which false in respect of that relation, is a point to be determined, as to each proposition considered by itself, through knowledge of the matter, and not otherwise.

When any of the terms are singulars, the propositional scheme which has been examined must, as framed with exclusive reference to common terms, be in part inapplicable. But, the singular term being treated as a common term distributed, forms will arise which are virtually equivalent to certain of our six. Some of the six are without any such parallels.

In the first place, both terms may be singular. In this very simple and unfruitful case, the only possible predications are equivalents of A² and E.

A greater variety of forms, as well as a wider possibility of inference, is produced by Mixed Predication, in which the given terms are, the one a common term, the other a singular. Now, we do not naturally think a singular term as predicate, either affirmatively or negatively, when the other term is common. Accordingly, with reference to the functions of the terms, a distinction may advantageously be taken, between forms which do spontaneously present themselves, and others which are gained only through logical analysis, or through a process of reflection virtually amounting to it.

1. Two of the six forms are in all cases excluded: I, by the impossibility of particularizing the singular term; A² by the impossibility of thinking an individual as constituting a class.

2. Equivalents of the other four forms are admissible, but under dissimilar conditions. (1.) The E is possible with either position of the terms. It occurs naturally and continually with the singular as subject: "John is not an (any) archbishop." With that term as predicate it occurs, per-

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 { haps, never, unless as the result of a scrutiny for purposes really logical; as, for instance, when we wish to change the form of a given argument. Technically speaking, it arises through conversion. (2.) The occurrence of A is both possible and incessant, the singular being the subject: "John is a (some) good man. (3.) The I², possible only when the singular is the predicate, is in the same predicament with the second variety of the E. It is, although the received logical rules disguise the fact, the just converse of A. (4.) The O is possible with the singular as predicate; but this, the weakest of all predicative forms, is stricken with more stubborn barrenness through the inflexibility of the singular. Probably the proposition is without example in ordinary and unanalytic thought; and its uses of any sort must be very rare.

These mixed forms are evidently ruled, with exceptions neither many nor obscure, by the same laws which govern predication through terms all of which are common. Inference from them, also, both immediate and mediate, is similarly placed towards inference proceeding purely through common terms. It seems sufficient, therefore, to have indicated, as here, the forms of mixed predication. No attempt will be made to assign for them any special laws of inference.¹

Predication, through common terms, in extension and in comprehension.

45. Our attention will henceforth be directed exclusively to Predication and Inference through Common Terms.

Predication through common terms is limited, in more quarters than one, by a corollary already noticed as following from the primary law of the concept, that is, the Inverse Ratio of the terms.

We cannot, in one and the same judgment, analyse a concept, or make a predication giving the result of the analysis, in both of the wholes which together make up the synthetic totality of the concept. "We must either think explicitly in extension, and imply comprehension; or think explicitly in comprehension, and imply extension."

Every term, with which there are given to us materials permitting predications of it in both wholes, must be thought as standing in an ordained series, of which it is not either extreme. Upwards from it in extension there must stand terms, one, or more than one, which are names of classes that contain, step by step, more objects, because the objects possess, step by step, fewer attributes. Downwards from it in extension there must stand terms, one, or more than one, which are names of classes that contain, step by step, fewer objects, because the objects possess, step by step, more attributes. The term from which we start takes, naturally, as antecedent, the function of subject in predication. We may find predicates for it by looking either upwards or downwards. But we cannot look both ways at once: and we gain one predicate or set of predicates by searching in

the one direction, another predicate or set of predicates by searching in the other.

The result, then, is this. Every proposition, framed with two common terms, must be either a *predication in extension* or a *predication in comprehension*. It must be, either, a predication of the subject in (or out of) the extension of another term, which is the predicate; or a predication of the subject in (or out of) the comprehension of another term as predicate. It cannot be both. We predicate of a term, as subject, in the extension of the predicate, by affirming of it a term denoting a more extensive class. We predicate of a term, as subject, in the comprehension of the predicate, by affirming of it a term denoting a less extensive class. Thus, of the subject-term "animals," we predicate in extension by affirming of it "organized beings," as predicate: we predicate of it in comprehension by affirming of it "birds."

Suppose a proposition is given, but only one. If, as in those examples, we happen to know the actual relations of the objects denoted by the terms, we can say, peremptorily, in which of the two wholes the predication is. But the question cannot be determined in the absence of such information. No assistance is yielded by any forms of expression, either usually occurring or at all likely to occur. Nor would it be easy, if so much as possible, to devise technical expressions adequate to the purpose. Abstract phrases, into which predications in comprehension are analytically resolvable, are in very many instances not extant: and it seems impossible so to mould them, that they shall fully denote the quantity of the terms. We think and speak, by preference, concretely; and we thus suggest predication in extension. If an assertion has really the opposite character, the fact must be inferred from data which are wanting in the case supposed. We say, in extension, "All animals are organized beings." But we say, likewise, in comprehension, "Some animals are birds."¹

46. Suppose, then, that there are given two common terms, under the conditions postulated, but without any further datum. Logic, if called on only to form one proposition, can determine nothing more than this: that the only alternatives of predication are yielded by A, I, E, and O; or by A² and I², also, if these are admitted.

Much closer determinations, indeed, can be reached, if given in an ordained series. any one of those propositions be supposed to be formed, and assumed to be either true or false. All the forms are so related to each other, through direct applicability of the logical axioms, that the assumed truth or falsehood of any one of them warrants us, with certain restrictions, in asserting the falsehood or truth of each of the others. These mutual relations are, by many logicians, considered, under the name of Opposition, as affections of the proposition; and the laws governing them are treated as laws of predication.

Strictly taken, this evolution of one proposition from another is inference, not mere predication: and other kinds of inference from one proposition have also to be examined. All will be taken together at the next and last step in our study of the proposition.

¹ Here arises a psychological question. It was noted, in the introduction, that, in the German nomenclature, the word "thought" does not include any cognition that is not discursive. It might have been added that, by Kant, the name is specified a step further, so as to signify only "cognition through concepts." If the word is to be thus narrowly understood, it can scarcely cover predication or inference in which any of the terms are singulars; yet these are logically treatable, and must therefore be admitted to signify thoughts. Some of the Kantist logicians have sought to remove the difficulty, by maintaining, that the significance of a singular term becomes a true concept, whenever it is an element in a judgment logically analysable. But, surely, such a theory ignores the distinctive character of the concept. The singular term is the symbol of an image (*Bild*), representative of an intuition (*Anschauung*) real or possible. That the representation is partial, incomplete, is nothing more than what seems to be true of every image. That the representation, if denoted by words, is symbolic, is a fact which cannot change its objective reference. Conception is necessarily symbolic; but symbolic cognition is not necessarily conception. Some of Mr Mansel's speculations bear closely and instructively on this question.

¹ The only available forms of expression (and even these but partially sufficient), would be gained through explicit signature of the quantity of predicates.—In dealing with the references which concrete and abstract thinking severally have to the two wholes of the concept, Mr Karslake has broken up ground which may hereafter prove to be very fertile. Again, the combination of concrete terms and abstract in the same proposition, the one as subject, the other as predicate, is, if it occurs spontaneously, a symptom of confused thought. If it is introduced wilfully, as it sometimes is in the logical treatment of given examples, it generates the same confusion, of which it is a natural expression. (See Hamilton's *Discussions*, p. 646.) "Whiteness," says Occam, "is not white."

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tions.

But the difference between predication and inference is nothing beyond a difference in the form of the data. We predicate in framing a proposition from given terms: we infer in framing a proposition from one or more given propositions. It is a doctrine to be insisted on, that inference is merely predication taking place in more steps than one; and that all the laws of inference are but variations, designed to meet greater or less complication of materials, of the logical axioms, which are strictly laws of predication.¹

This is one reason for considering exactly, from the position now reached, the laws which govern the formation of propositions from given terms, in a class of cases differing considerably from that which has just been laid aside. Let there be given common terms, either two, or more than two; and let there be given with them, not the quantitative signs, but, which is much more, an explicit *ordination of the terms*. The ordination may be indifferently in extension or in comprehension, provided only we be informed in which of the two it is.

Is such an ordination ever actually given? And is it recognisable without interpretation of the terms? Both questions must be answered, in the affirmative. On the one hand, it is, as we shall immediately see, the datum of every definition and of every logical division. On the other hand stands a fact which concerns the logician still more nearly. In every syllogism, having premises which allow any inference, there are given three terms: and, if these terms are common, there is implied, and easily extricable, an ordination of these, the discovery of which does not require any scrutiny of their meaning. The ordination being gained, we may, by combining the terms two and two, form, not only the conclusion of the given syllogism, but also several or many other propositions. All these results are accessible through canons, which are nothing but corollaries, the simplest and most obvious, from the principle of the concept, the law of the inverse ratio.

We shall have laid the broadest and firmest foundation for a just understanding of the character of syllogistic reasoning, if we satisfy ourselves, at present, that all syllogistic conclusions are attainable through direct comparison of the terms of the argument, without the explicit statement of the relations of the terms in the form of propositions. All Inference, whether Immediate, that is, from one proposition, or Mediate, that is, from propositions more than one, is merely an explicit assertion of the implied relations of terms. The process is called inference, when the relations of two or more terms are given, as already explicated in propositions; and when the problem proposed is the analysing of those propositions, for the purpose of discovering what other relations are implied in the assumed ones, and may, therefore, be expressly deduced from them. The process would not be called inference, but predication, if the relations of the terms were given as unexplicated; which is the case when the terms are only described for us as holding certain places in an ordained scale. The theory of reasoning is not reduced to its utmost simplicity until it has been made evident, that the process, into whichever of the two forms the data may throw it, is really one and the same.

Therefore it is desirable that we should, at once, put ourselves in possession of the laws which regulate predication through common terms, both in extension and in comprehension. Another reason is this. When we come to study inference specially, its two kinds, immediate and mediate, must be taken separately. Some of these laws of predication bear on the one kind of inference, some on the other;

consequently, if not now collected, they would appear only as isolated theorems. Some of them, too, would not come clearly into light at all.

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I. Predication in Extension.

47. Let there be given, as ordained in extension, from highest to lowest, a series of two or more terms: and let it be required to predicate with these in extension, both affirmatively and negatively; that is, let it be required to assert of one term, given as subject, that it is in, or out of, the extension of another term found as predicate. The possibilities of affirmation and negation, and the quantitative determinations of the terms, are set forth in the following rules.

The laws of
predication
in extension:
affirmation and
negation.

(I.) AFFIRMATION.

I. Of any subordinate term, there may be affirmed any term positively superordinate to it, either immediately or mediately. This is the one universal canon.

Co-ordinates are here excluded from consideration. All the objects of the subordinate class are, through the relations involved in the character of concepts, included in each of the classes positively superordinate to it. All the objects which, in respect of a certain attribute, are called by the name of the subordinate class, are some or other of the objects which, in respect of other attributes, receive the names of the superordinate classes. If the given series, ordained from highest to lowest, be X, Y, Z, we may affirm that "All the Z's are some Y's;" that "All the Y's are some X's;" and that "All the Z's are some X's."

II. Of a subordinate term, given as distributed, a positive superordinate may be thus affirmed, through any of several presuppositions; and these, if successively engrafted on each other, will throw the process into several different forms.

(1.) Of a subordinate term there may be affirmed, universally, any term thought as superordinate to it, immediately or in the first degree. There is thus formed a simple predication of identity in A; as, "All the Z's are some Y's;" or, "All the Y's are some X's."

(2.) In such a proposition there is implied another. The subordinate being given as distributed, there may be affirmed of it, as undistributed, the same superordinate. If all the objects of the lower class are included in the higher class, some at least of them must be so. We have thus from one predication of identity derived a second, from an A an I: "Some of the Z's are some Y's;" or, "Some of the Y's are some X's." The process is an immediate inference by subalternation.

(3.) Of a subordinate term (distributed or undistributed), there may be affirmed, in A or I, a term thought as superordinate to it mediately in the second degree; that is, a term thought as immediately superordinate to the immediate superordinate of the given term. The objects (all or some) of the given class Z are identical with some or other of the objects of the class immediately superordinate, Y; and all the objects of the class Y are identical with some or other of the objects of its immediate superordinate, X: therefore, necessarily, there are, in the intermediate class Y, objects which, in respect of one attribute, receive the subordinate name Z; while, in respect of another attribute, they receive the superordinate name X. If all the identities which are thus discoverable are explicitly enunciated, they yield the three following propositions:—"All (or some) Z's are some Y's (A or I)"; "All the Y's are some X's (A)"; "All (or some) Z's are some X's (A or I)." The third assertion of identity is elicited from the first and second, considered in relation to each other. "The Z's (all or some) are identical with some or other of the Y's (A or I); and all the Y's are identical with some or other of the X's (A or I); therefore the Z's (all or some) are identical with some or other of the X's (A or I)." In this explicated

¹ See, afterwards, *Doctrines of Inference*, chapter i.—Compare Mansel, *Prolegomena*, pp. 196, 207. By Twisten (*Die Logik, insbesondere die Analytik*, 1825), all the forms of thought are exhibited in an ascending series, whose members increase in complexity according to the character and number of the data.

Doctrine of form of all the steps, the process is a mediate inference of the least complex kind. The three propositions constitute an Affirmative Syllogism.¹

(4.) Of a subordinate term (distributed or undistributed), there may be affirmed, in A or I, a term thought as superordinate to it in any degree beyond the second. When such a process is evolved at every step, it is found to consist in repeated predications of identity: it is, in fact, an extension, through higher degrees, of the process of syllogistic inference. The series of propositions is called by logicians a Sorites; the ultimate conclusion of which must, on such data as these, be affirmative, but may be either universal or particular.

(II.) NEGATION.

As affirmation in extension rests on the law of identity, applied to objects thought as included in classes, so negation in extension rests on the law of difference, applied to objects thought as excluded from classes. If, of either Z or Y, I am entitled to deny X, this must be because I think of X as being something different from Z or Y: X must be thought as equivalent to Not-Z or Not-Y. It follows, that negation is not applicable to a series of terms positively ordinated, unless by substituting, in the predicate, the contradictory of a term for the term itself; as if, for "All X's are some Y's," we should take the equivalent negation, "The X's are not any Not-Y's."

But negation finds a place without this expedient, as soon as there is incorporated into our positive series of terms a Co-ordinate of any one of them. Terms co-ordinate are thought as being, not indeed absolutely, but within the given sphere of thought, contradictories of each other.² Thus, if our thinking is limited by its hypothesis to the class of objects which we call "organized beings," that class may be further thought as containing only two sub-classes, "animals" and "vegetables;" hence all organized beings which are animals, are thinkable also as being "not-vegetables;" and so the opposite way. Co-ordinate classes must admit of being so thought, if they are to obey the law which makes such classes to be exclusive of each other. Any two classes being thought as co-ordinate, all the objects of each are thought as having some attribute wanting in all the objects of the other. Therefore any object which is in the one class cannot be in the other: the two terms must be names for two groups of objects totally different.

One special remark is required. If we either know the meanings of terms, or have received an ordained series, we can determine peremptorily, as to any proposition framed with a higher term and a lower, in which of the two wholes of the predicate the predication is made. But every proposition denying one co-ordinate of another, may be regarded as being either in extension or in comprehension: for each of the terms excludes the other in both relations.

The rules cannot conveniently be grouped, like those for affirmation, under one canon covering all possible cases.

¹ Here, accordingly, we hover very near to debateable ground, which must afterwards be fairly traversed. If the terms of a conclusion are thought as ordained in one degree, it is reached through simple subalternation. But the question may be raised, even now: whether, supposing it is only through inclusion in Y that we do actually think the inclusion of Z in X, both of the steps constituting the premises must necessarily be thought explicitly in the form of judgments; or whether one of them may not, without detriment to the process, continue unexplicated and only implied.

This inevitable limitation of the sphere, within which the laws of difference and excluded middle must work when the terms constitute an ordained series, is strongly put by Trendelenburg, and grounds his attack on division by dichotomy. (See his *Logische Untersuchungen*, vol. ii., p. 317, and elsewhere; and his *Elementa Logices Aristotelicae*, § 58.) It is also very firmly apprehended by Mr De Morgan. (*Formal Logic*, p. 38, and *passim*.)

But, throughout all of them, the co-ordinate takes the place of which, in the affirmative rules, was held by one of the superordinates. Let X, Y, Z, be given in ordination as before, and let a, b, c, be co-ordinates of those three terms severally.

I. Of any common term, there may be denied universally any term thought as co-ordinate to it.

There is thus formed, on principles already explained, a simple predication of non-identity in E: as, "Any X's are not any a's:" and so of the other terms.

II. Of any common term, there may be denied particularly any term thought as co-ordinate to it.

The process is an immediate inference by subalternation, yielding an O: as, "Some X's are not any a's." Its principle is that of the corresponding affirmation.

III. Of a subordinate term (distributed or undistributed), there may be denied any of the co-ordinates of any of its superordinates.

There arise, in this way, when all steps are explicated, processes of mediate inference, corresponding to those for affirmation, only with substitution of a co-ordinate for the superordinate of a superordinate. The principle is very plain. The subordinate is included in the superordinate; from the superordinate its co-ordinate is excluded: therefore the co-ordinate is excluded from the subordinate.

(1.) Of the subordinate (distributed or undistributed), there may be denied, in E or O, any co-ordinate of its superordinate in the first degree.

A co-ordinate of Y will be signified by b, which is thus equivalent to "Not-Y." Our terms will then yield these three predications, the first of identity, the other two of non-identity: "The Z's (all or some) are some Y's (A or I); any Y's are not any b's (E): therefore the Z's (any or some) are not any b's" (E or O). The series of identities and differences is self-evident. The three propositions constitute a Negative Syllogism. Accordingly this kind of syllogistic inference is, when analyzed in reference to the wholes of the terms, resolvable into an ordination having a different character from that which produced affirmative conclusions. The terms rise by one step only; and the higher term of the two, instead of rising by inclusion into a third, diverges by exclusion into the parallel or co-ordinate.¹

(2.) Of a subordinate term (distributed or undistributed), there may be denied, in E or O, any co-ordinate of any term superordinate to it in any degree beyond the first. Such a process yields a Sorites, whose conclusion may be universal or particular, but must be negative.

II. Predication in Comprehension.

48. We must, and do, predicate in comprehension as well as in extension.

Not only, however, is it true, as has already been remarked, that we naturally express ourselves in those concrete forms which are appropriate to extension; but, further, we never do, naturally or spontaneously, either think or

The laws of predication in comprehension: affirmation and negation.

¹ It does not seem possible to escape from this result of the analysis, if the negative forms are to be preserved. Nor can it be said to trench, in the slightest degree, on that more exact analysis of the Syllogism, which will, by and by, be attempted on the same principle.

But, if it is insisted on that the syllogism shall exhibit the X, Y, Z, in a regular scale of positive ordination, the negative syllogism may be made to do so by being transformed into an affirmative one. This is effected through a process which we shall immediately become acquainted with,—Contraposition. The excluding of the subject from the sphere of the predicate, is equivalent to the including of it in the sphere (indefinitely wider) of the contradictory of the predicate. The proposition "The Y's are not any b's," thus becomes "All the Y's are some Not-b's." Our negative syllogism might, through this change, become affirmative thus: "The Z's (all or some) are some Y's (A or I); all the Y's are some Not-b's (A): therefore the Z's (all or some) are some Not-b's (A or I)." Our ordained terms are now these: "Not-b, Y, Z;" and the analysis of the affirmative syllogism is exactly applicable.

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to speak in systematic pursuance of that course of thought which predication in comprehension would signify. We think from objects as data; and we scrutinize their attributes only as enabling us to place the objects in classes, to think of them as amenable to laws. Predication in comprehension does not emerge spontaneously in reasoning, unless in conjunction with predication in the opposite relation, and with a view to the ultimate establishment of that other.

So far in the background does predication in comprehension lie, that it is only modern logicians that have given systematic attention to its bearings on any doctrines of the science; while even of these there is only one who has brought to light its highest results. The four received forms of propositions, on which exclusively the received logical system rests, do not allow correct expression for this relation of the concept: and inferences bearing on it, whether mediate or immediate, require one additional form before they can be enunciated so that their validity shall be self-evident.

With anticipation, therefore, of uses to be found hereafter, it is well that the laws of predication in comprehension should be briefly set forth. They do not require to be elaborated so formally as those of extension, with reference to which, mainly, the laws of inference will be expressed. But the right apprehension of them demands patient attention, on account both of the smallness of the assistance which the orthodox systems give towards it, and because of the difficulty we all have in seizing this relation distinctly.

If we adopt, for exemplification, the same three symbolic terms as before, the ordination of these must, by reason of the inverse ratio of the wholes, take place in the opposite order. Ordinated in comprehension, from highest to lowest, they will stand thus: Z, Y, X. It will be convenient, also, to illustrate the sequence by predication with significant terms: as these, for the three in their order:—"Man, animal, organized being."

(I.) AFFIRMATION.

I. Of any term subordinate in comprehension, it is true, first, that there may be affirmed of it any term superordinate to it in the same relation; secondly, that the affirmation must be particular; thirdly, that the affirmation must, if its interpretation is to be exhaustive, be held to have its predicate distributed, that is, to be in I² not in I. The proof is easy.

Let our affirmation be this: "Some Y's are Z's: some animals are men." When we thus, in respect of comprehension, ascend in passing from subject to predicate, we do, by the same step, descend in extension.

(1.) From whichever of the two sides we regard the terms, it is clear that affirmation is possible. The attribute, whose possession by certain objects is intimated by the subject, is possessed also by all the objects named in the predicate. Terms rise in comprehension, and fall in extension, not by signifying fewer and fewer attributes, but by adding, at each step, a new attribute to the first. There cannot but be objects nameable by both terms.

(2.) The increase in signified attributes carries with it a decrease in contained objects. The predicate, as implying one attribute more than the subject, cannot completely fill the extension of the subject: the subject-class must contain, besides the objects that are in the predicate-class, those objects also which are not in it as not possessing its attribute. The affirmation must be particular.

(3.) The distribution of the predicate becomes most promptly visible if we first affirm with the same terms in extension. We thus gain the assertion: "All Z's are some Y's: All men are some animals." The counter-relation is incompletely rendered, if it is held to yield anything

less than an exact and complete reversal of this affirmation. The affirmation in comprehension must be an I²: "Some Y's are all Z's; some animals are all men." The nature of the ordinative relation elicits clearly the same signification. It is true, of some of the Y's, not that they are a part of the class Z, but that they constitute the whole of it: there are, by the hypothesis, no Z's besides those that are Y's. There are certain objects which are "animals:" but these we can call only "some animals;" because there are other animals besides them. Of those objects it is not true, that they are the same objects with "some" of those we call "men," and different objects from "some other" men: it is true that they are the same objects to "all" of which we give the name "men." The interpretation of the affirmation as I, "Some animals are some men," is doubtless safe, as asserting within the truth. It might, also, be formally justifiable, if we were to read the quantitative sign as "some at most." But, first, this is not the logical reading; and, next, if it were adopted, the affirmation would violate the sound precept of the logicians—that every proposition shall explicate completely the relations implied in its data.

II. The affirmation being already particular, subalternate inference from it is not possible according to the received scheme. But, if we are to adopt the I², we must hold it as admitting a subalternate, through a formal limitation of the predicate, implying a real limitation of the subject also. This subalternate is just the I, which usually takes the place of the I². "Some animals are all men;" therefore, also, "Some animals (but a narrower 'some' than the first) are some men."

III. Mediate inference is possible through affirmation in comprehension, as widely as through affirmation in extension. But it is expressible only through the admission of I², if the propositions are to contain on the face of them evidence of the validity of the process.

It is sufficient, for the present, to set down, in the relation of comprehension, the universal mode of the same syllogism which already exemplified the relation of extension, together with a parallel in significant terms. "Some X's are all Y's (I²); some Y's are all Z's (I²): therefore, some X's are all Z's (I²)." "Some organized creatures are all animals; some animals are all men: therefore some organized creatures are all men." Breaking loose from almost every formal rule of the syllogism, this argument does not violate any one of its philosophical laws.

(II.) NEGATION.

I. II. Co-ordinates, when considered without reference to other terms in a series, are indifferent to the two wholes of the concept. It follows, that the same two rules which stand first and second for predication in extension, may hold, and for the same reasons, a corresponding place here.

III. Of a term subordinate in comprehension there may be denied any of the co-ordinates of any of its superordinates. But the denial must be particular.

In respect of the quality of the proposition, this rule is proveable by the same considerations which established the parallel rule in extension. The limitation of quantity requires no illustration beyond those already given in this section.

In negation, as in affirmation, the mediate inferences thus formed might be, though they never have been, carried upwards from the simple syllogism into the sorites.

III. *The Transference of Predication from Whole to Whole.* The laws regulating the transference of predication from whole to whole.
49. For the perfecting of our insight into the character of predication in extension and comprehension, it is necessary to consider cursorily a relation which must afterwards be scrutinized more minutely, as yielding one of the kinds of immediate inference.

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tions.

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It is self-evident, that we may not only predicate in either whole, but also transfer a given predication from the one to the other. It seems to be almost equally plain, that the process which is called Conversion is nothing else than such a transference. Its theory is not made complete until it is contemplated in that aspect. The rules of the process will immediately be assigned; but the foundation for them ought to be here laid, in a few theorems, which appear to require little, if anything, either of proof or of illustration.

(1.) Any two common terms may be ordained in either whole; and ordination in either implies and yields ordination in the other.

(2.) Consequently, any two ordained terms may yield either a predication in extension, or a predication in comprehension.

(3.) By reason of the inverse ratio of the two wholes, the terms must, in the two propositions, discharge opposite functions: that which is subject in the one must be predicate in the other. If X is in the extension of Y, Y must be in the comprehension of X.

(4.) Consequently, again, if there be given a proposition which predicates in the one whole, it may, by a simple reversal of the functions of the terms, be transformed into a proposition predicating in the other whole.

(5.) The process of conversion is nothing else than such a transference of predication from a given whole into the other. The special rules of conversion find their principle in the law of the concept: they are merely adapted forms of those corollaries of that law, which regulate predication in the two wholes.¹

CHAPTER III.

The Laws of Definition and Division.

The form and character of definition and division.

50. Affirmative propositions, having both terms distributed, have uses which give them a special scientific and philosophical value: A² is the form necessarily assumed by Definitions and Divisions correctly constructed. The character, likewise, of definition and division, is dependent on the doctrine of the concept. A definition is nothing else than a development of the comprehension of a common term, through terms lying above it in extension. A division is a development of the extension of a common term, through terms lying above it in comprehension. Both may be said to have for their purpose the making concepts more distinct; the one by evolving concepts in whose extension the given concept lies, the other by evolving concepts in whose comprehension it lies. It is a consequence flowing necessarily from the mutual and inverse relation of the two wholes of the concept, that its comprehension shall be made more distinct through its extension, and its extension through its comprehension. We determine what are the attributes of given objects, by finding what classes they may be thought in: we determine what objects are contained in given classes, by finding what attributes they may be thought as possessing.²

¹ This view of the character of Conversion does seem, not only to flow, by consequence obvious as well as necessary, from the principle of the concept, but to be necessary for thoroughly grounding the theory of the process. But certainly, so far as we know, it has not been stated by any, even of those recent logicians by whom, in this country and in Germany, the mutual relations of extension and comprehension have, in their bearing on other logical doctrines, been most deeply probed.

² Division and definition have long been thus analyzed by the German logicians; the latter as an evolution of the comprehension of a concept, the former as an evolution of its extension. Their theory of division is almost complete: their theory of definition is not so near to being so. It does not seem correct to say, as it is said by some (not all) of them, that the concept is made more "clear" by division, more "distinct" by definition: in the appro-

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The three stages in the development of ideas.

51. Our thinking of objects may pass through very many stages, on its way towards becoming a knowledge of the objects. The principal of those stages may be said to be three; and to these have been assigned names, the technical meanings of which, being specifications of the ordinary meanings, require some explanation. Our ideas of objects may be either Obscure, Clear, or Distinct.¹ *First*, Our idea of an object is obscure, when we are not able positively to distinguish it from other objects; when we are unable to determine the question of identity or non-identity. Such a thought of the object is not knowledge of it in any sense. *Secondly*, Our idea of an object is clear, when we are able to distinguish it from other objects; when we are able to determine the question of identity or non-identity. Our thinking of individual objects must rise to this point before we can be said to know them: and, while objects are contemplated merely as individuals, this point cannot be transcended. But, in whatever light objects are regarded, clearness in our thinking of them must have place if any further step is to be taken. *Thirdly*, Our idea of objects is distinct, when, besides being able to distinguish them from others, we are able also to distinguish the relations between them and other objects. The distinguishing of the relations between objects is attainable only through the detection and discrimination of their attributes, and the consequent distribution of them in thought into classes. Perfect distinctness of thinking, in this appropriated signification of the phrase, is evidently not attainable in regard to any object of human knowledge: and, as far as there are relations of an object which we cannot distinguish from others, our idea is indistinct. Distinctness, therefore, is relative,—relative to the purpose of our thinking: and the practical question in a given case is, whether, with reference to the purpose, the distinctness is adequate or inadequate.

Accordingly, obscure thinking cannot yield terms of any kind that shall be useable with intelligence. Clear thinking may be represented either by singular or by common terms. Thinking which, besides being clear, is also distinct, can be signified by common terms only.

52. Having gained a clear idea of a class of objects denoted by a common term, we next seek to make that idea distinct, by evolving such relations to other objects as are implied in the notion of the class. Using our common term as subject, we attain a step in distinctness by each other common term which we are able to affirm as predicate of it. Such affirmation we can justify to ourselves through, but only through, a preconceived ordination, in which our common term is one of the members; and we have the affirmation when we place our common term either in the extension or in the comprehension of another common term. Further, when we place a term Y in either whole of another term, as either X or Z, we do so really for the purpose of evolving an element in the other whole of Y. The interlacement and inversion of the two wholes are inextricable and constant.

On the one hand, looking upwards in the scale of extension, we place our given class in a higher class, which, besides our given objects, contains also others having certain of the attributes of ours. Thus we affirm, in extension, that "All Y's are X's:" that "All animals are beings organized;" that all animals are contained in the class of organized beings. In so predicating, we make our idea of

appropriated meaning of those terms, as explained immediately, increase of "distinctness" appears to be what is gained in both ways. (But see Mansel, *Prolegomena Logica*, pp. 186-194.)

¹ The distinction, currently applied in the German schools, and lately beginning to be familiar among us, is Leibnitz's. It is laid down in his *Meditationes de Cognitione, Veritate, et Ideis*, and illustrated in his *Nouveaux Essais*, book ii., chap. 22; (*Opera*, ed. Erdmann, pp. 79-81, 288-292).

Doctrine of "animals" more distinct, by evolving the fact that animals possess the attribute of organization; that is, that "organization" is a part of the comprehension of "animal."

On the other hand, looking downwards in the scale of extension, we place our given class in a lower class, which contains fewer than all the objects of our class, because all the objects it does contain possess attributes not possessed by all our objects. Thus we affirm, in comprehension, that "Some Y's are Z's;" that "Some animals are men;" that some animals possess the attribute humanity. In so predicating, we make our idea of "animals" more distinct, by evolving the fact that some animals belong to the class man; that is, that "man" is a part of the extension of "animal."

Thus we have made our idea of a given term more distinct by two steps in opposite directions, through our possession of two other terms, the one higher than it in extension, the other lower. By placing Y in the extension of X, we enable ourselves to infer that X is in the comprehension of Y. By placing Y in the comprehension of Z, we enable ourselves to infer that Z is in the extension of Y.

Hypothetical growth of a definition and a division: the first step.

53. Suppose our whole knowledge of a common term Y, or of the objects denotable by it, to be present to the mind in the implicative shape of a series of terms, ordinated in extension; suppose that the series stretches from our common term both ways, upwards and downwards; and suppose, also, that it embraces no co-ordinate terms. The knowledge thus implied would be completely explicated by two successive affirmations. In each of these Y would be the subject: while the predicates would be the other terms of the series; the higher terms in the one affirmation, the lower in the other.

Let our series be this: "Organized beings—Animals—Men—Europeans—Scotsmen;" and let it be understood as an implicit expression of the complex idea signified by the term "*Men*."

In extension we may affirm, that "All men are animals and beings organized." Analytically taken, the assertion is this: "All men—are—some of those beings who are both animals and beings organized; or, "All men—are—some of those beings who possess the attributes animal life and organization." We have evolved two attributes which are in the comprehension of the term "man." Conversion makes the assertion a predication in comprehension: "Some of those beings who possess the attributes animal life and organization—are—all men." Our proposition is, in fact, a definition. It is, doubtless, an unsatisfactory and imperfect definition; and it betrays its faultiness by the non-distribution of one of its terms. But it is the only definition of "man" which our data allow us to form.

In comprehension, again, we may affirm, that "Some men are Europeans and Scotsmen." Analyzing the assertion, we have it thus: "Some men—are—all those beings who are both Europeans and Scotsmen;" or, "Some men—are—all those beings who, while they are in the class Europeans, constitute the class Scotsmen." We have evolved two classes, both of which are in the extension of the term "man." Conversion makes the assertion a predication in extension: "All those beings who are both Europeans and Scotsmen—are—some men." Our proposition is, in fact, a logical division. It is an imperfect division; and the non-distribution of one of the terms brings the imperfection to the surface. But it is the only division of "man" that can be developed from the data.

The definition and division we have formed are both of them imperfect: they want something they should have. But they may be said to be also redundant: they have something which, in most cases, they need not have. It is well to clear away the redundancy before scrutinizing the grounds of the incompleteness.

54. In attempting to frame either a definition or a division, we pay especial attention to two points of limitation. We aim at simplifying both thought and expression. Entertaining this design, we directly explicate those elements only of the idea, those relations only of the objects, which we foresee to be available in the subsequent progress of our reasoning. We leave undeveloped all elements or relations, which do not seem to have a prospective bearing; and we do so with safety, if the elements we neglect cannot emerge as we proceed in thought.

Perhaps we are well acquainted with the objects compared; while, also, our field of reasoning is not to spread beyond a few of their relations. In such a case we shall usually, even if we have antecedently thought out a long series of ordinated terms, neglect all except one of the higher terms, or all except one of the lower. If we should wish to define the term "man," from materials supplied by the ordination lately given, either the attribute of animal life or that of organization would oftenest be the only one of the two in which we are directly interested. If the case be so, we shall content ourselves with asserting, either that "Man is an animal," or that "Man is an organized being." So, if we wish to divide the term "man," we shall almost always assert only, either that "Some men are Europeans," or that "Some men are Scotsmen;" we shall not make both assertions. In a word, we evolve only one step in the ordination; whether that be the first step either way from our given term, or a step more distant.

There are, however, three cases at least, all of them not only supposable, but actual, in which it becomes necessary to evolve more steps than one, or even a considerable number. In the first case, either definition or division is attempted, when our knowledge of the objects is so narrow as to yield only a series of terms, which do not justify a sufficient number of exclusions (co-ordinates being here the terms that will be wanting). Secondly, either may be attempted, when language does not furnish words clearly implicative of suppressed steps in a series. Lastly, either may be attempted, when, though knowledge and language should both be sufficient for their work, our definition or our division is designed to be the foundation of a very wide and complicated system of knowledge. Scientific definitions and divisions, for example, especially the former, are often necessarily complex, setting forth several steps from an ordinated series of terms; and the desire to simplify and abridge the series is one of the strongest of those many reasons, which justify the invention of technical names.

55. The incompleteness of our examples of growing definition and division is a point lying much deeper than their at first redundancy. The reason of it, and the remedy, require to be considered with especial closeness in their bearing on the definition.

(1.) It is, as we have seen, necessary to a definition, that the term to be defined be placed in the extension of at least one other term. The objects denoted by the given term are thus included in a class, all the objects of which have a certain attribute; and this attribute is a mark of the given term, that is, a part of its comprehension.

In defining "man" from our series of terms, we must be able to predicate of it one of the superordinates in extension. We must at least be able to affirm, that "All men are animals;" and, for most definitions of the term, the wider affirmation, of "organized beings," will not be required.

(2.) Such a placing of the term in the extension of a superordinate, or even in that of several or many such, is not sufficient. By the hypothesis involved in ordination, there may be, and we know that in fact there always are, other terms, thinkable as co-ordinates of the given term. Of each of these co-ordinates the superordinate might be affirmed, as well as of the term to be defined. Therefore

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Definition and division at their second step of growth.

Doctrine of it is that, in our embryo definition, the superordinate term was undistributed: "All men—are—some animals;" there may be, and we know there are, other animals besides men.¹

(3.) What is sought, in addition to the superordinate, is, the means of distinguishing the given term from its co-ordinates. But distinction is negation. Therefore, besides affirming the superordinate, we must be able to deny all the co-ordinates. We must have, for incorporation, as a sub-ordinate element of our predicate, the import of a proposition of exclusion.

Suppose we know only that there are animals which are not men. The two co-ordinate terms "men," and "not-men" (animals being implied), constitute together the immediate extension of the term "animal;" and either of the two is, by the law of predication for co-ordinates, deniable of the other. This filling up of the class "animal" by the two subclasses, would enable us to frame a definition, which could hardly ever be useful, but which might sometimes be the only one attainable, while in form it would be quite regular, though very awkward: "All men—are—all animals that are not Not-men."

But we may know something more: we may know names denoting all the co-ordinates of "man:" we may know that there are (according to a loose zoology, more generally understood than more scientific ones) five kinds of animals besides man. These five, taken together, become equivalent to our "animals that are not-men." Our definition will now stand thus: "All men—are—all animals that are not beasts, nor birds, nor fishes, nor reptiles, nor insects." But the definition, so altered, is still of little use. It cannot become extensively available, so long as it is merely negative of the co-ordinates.

(4.) The definition may be perfected when we have discovered some attribute, which is either possessed by the class denoted by the term to be defined, and wanting to all its co-ordinates, or possessed by all the latter, and wanting to the former. Such an attribute (in the former case), or its contradictory, denoting the want of it (in the latter), is a mark of the given term. The co-ordinates, as not possessing the mark, are thinkable as all of them contained in the contradictory of the given term, and may, therefore, be denied of it. The legitimacy of this denial is implied, when we affirm that the attribute, or its contradictory, is a mark of the term to be defined.

The schoolmen were wont to assign "rationality" as an attribute which is a mark of man, because alleged to be wanting to all other animals. "Not-rationality," the want of rationality, its contradictory, would thus be the attribute possessed by the co-ordinates, and wanting to man. Accepting this mark, we should now be able to express our definition in either of two shapes. Negatively, we should say, "All men—are—all animals that are not non-rational;" and here "non-rational" takes the place, and is an exact equivalent, of our "not-men," and "neither beasts nor" other animals. Affirmatively, we should say, with exact identity of meaning: "All men—are—all animals that are rational."

It has been necessary, for the completion of the analysis,

¹ Students of the science, who may be disposed to bestow close attention on the theory of the Definition, may be invited to scrutinize for themselves the point which it is here attempted to bring out; namely, the function of co-ordination in the process of defining—the fact that one of the elements of the definition (it is that which the schools call the Specific Difference) is equivalent to a negation of the co-ordinates of the definitum. The embryo of this doctrine lurks in several systems of logic. But it does not seem to have anywhere come fairly above ground. Indeed, in some of the best of the German books, the difficulty (which has not been overlooked) of determining the relations between the definitum and the specific difference has proved to be insurmountable. Twisten, the most clearly systematic among the formal logicians of Germany, has (strange to say) expressly denied the applicability of co-ordinates as elements of a definition. (*Die Logik*, p. 211.)

to bring out the negative form of the definition. But the affirmative form is always, and rightly, preferred when it is attainable: the distinctive mark is more readily useable in this shape. Besides this, it does more frequently offer itself in this shape than in the negative. It is usually easier to discover, by observation, an attribute possessed by one class and wanting in others, than to discover an attribute which, while wanting in one class, can peremptorily be asserted to be universal in each of several others.

(5.) In respect of formation, as it thus appears, a definition grows out of two several assertions. These are, both of them, in extension, though in different degrees; and, further, they are opposed in quality. It has been affirmed that the definitum (the term defined), is identical with a part of the extension of a superordinate term: it has been denied that the definitum is identical with the extension of any co-ordinate terms.

(6.) In result, a definition is, in the form it commonly wears, a predication in extension; because the term given to be defined tends naturally to preserve its place as subject. But, as its terms, being equivalents, are interchangeable, conversion throws it into comprehension. Which of the forms it may take, is a question utterly indifferent. For it is an affirmation that the *Definitum* and the *Definitio*, the subject and the predicate, are terms identical both in extension and in comprehension; that they are merely two several names for one and the same class of objects.

It is, however, the comprehension only that the definition evolves: the defined term being one of the two terms, the other term explicates those terms which constitute its comprehension. The proposition is an assertion that the comprehension of the term defined is constituted by certain attributes; that the comprehension of "man" is constituted by "animality" and "rationality." Looking to the other side, all that we are told is this: that the extension of "man" is constituted by all objects, whatever they may be, which possess both of those attributes.

56. The way having been found to the removal of incompleteness in a definition, similar dealing with a division is much facilitated.

Division at its third step of growth.

The term to be divided is the name of a class: it will be divided in one step, when we have affirmed of it the names of all the co-ordinate sub-classes which constitute, in one degree, the extension of that class. The divided class, and the aggregate of the sub-classes into which it is divided, are co-extensive. The objects which, when thought of in one group, are denoted by the one given term, are the same objects which, when thought of in several groups, are adequately denoted, all of them, by the enumeration of the terms we have evolved out of the given one. The subject and the predicate of a proposition enunciating the division, are but different names for one and the same aggregate of objects: therefore they are interchangeable; and the conversion of the proposition is free both ways.

So long as our terms were only the given term on the one side, and one, or some, of the terms subordinate in extension on the other, one of the terms (the term given) was necessarily undistributed. We had to say, before, "Some men—are—all Europeans;" or, "All Europeans—are—some men." But, in order to complete our division, we learn that the class "man," when we divide it on the principle of local habitation, may be loosely distributed into five sub-classes. At length, therefore, by uniting the names of all those sub-classes to form one of our terms, we gain a proposition in which both terms are distributed. We say, "All men—are—all Europeans, all Asiatics, all Africans, all Americans, all Australasians;" or, "All Europeans, all Asiatics, all Africans, all Americans, all Australasians—are—all men."

These forms of expression, however, are awkward, and may

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be deceptive. If they are to be adopted, the "all" will be understood (naturally, and perhaps unavoidably), not distributively, but collectively. On this footing the terms are equivalent to singulars; and the propositions are unmanageable. But let our "all" be understood distributively: we are thus led to the alternative or disjunctive form of speech in the enumeration of the subordinate terms. "All men—are—all men who are either Europeans, or Asiatics, or Africans, or Americans, or Australasians;" or, "Every several man—is—every several man who is either a European, or an Asiatic, or an African, or an American, or an Australasian:" and so when the terms are reversed.

Now, it is in this alternative shape, though without signature of the predicate, that we do always, in ordinary thought and speech, express a division. We say: "Every man is either a European, an Asiatic, an African, an American, or an Australasian;" or, "Every one who is either a European, an Asiatic, an African, an American, or an Australasian, is a man." This fact is a guide-post, pointing out the road by which we reach the application of divisions in reasoning.

Divisions may, of course, be carried down in more steps than one; in as many steps, indeed, as our presupposed ordination allows, and the purpose of the division makes to be desirable. But, cumbrous even when embracing one step only, they become, when stretched farther, almost inexpressible in the shape of explicit propositions. In such cases, and sometimes in the simpler ones, they are usually left unexplicated. Scientific writers, especially in the sciences of Classification (where both definitions and divisions are often exceedingly complex), content themselves with exhibiting the ordained series of terms in a tabular shape: and from this series special propositions are extricable when called for.

A division, then, is a proposition which, when the term to be divided is taken in its natural function as subject, is a predication in comprehension, but which is readily transformable into a predication in extension. It is the extension only of the divided term that is evolved. The divided term being one of the terms, the other explicates the terms which constitute its extension. The proposition is an assertion that the extension of the divided term is constituted by certain sub-classes; that the extension of "man" is constituted by all the objects of the five named classes. On the other side, we are told only this: that the comprehension of "man" is constituted by all the attributes, whatever they may be, which are possessed by all those objects.

Division
compared
with defini-
tion

57. The theory of division is not yet wholly before us. It is completed when we contrast the process with definition. The result rests, as closely as that of definition, on preformed propositions. The character of these is unchanged; but their relative prominence is reversed.

(1.) There is, in division, a mutual negation of two co-ordinates; and this negation has for its basis the necessary inconsistency between a term and its contradictory.

Of the evolved terms constituting the extension of the given term, we fix our attention on some one: if we take more than one, these are thought as one. We must be able to think of this one term, and of all the others taken together, as being contradictories of each other. If "European" is the term we attend to, the other four are for us equivalent to "Not-European." Our implied negation is, that Europeans on the one side, and all its co-ordinates on the other, are mutually exclusive; that Europeans are not any persons who are either Asiatics or persons of any of the other classes. But this is on the assumption that the same negation might be made through the contradictories; that we should be expressing the same denial, although with a narrower assumed knowledge, by saying, that "Europeans are not Non-Europeans."

Each of the co-ordinates must thus, in its turn, be thought as deniable of all the rest, or as having all these as constituting its contradictory. If it were not so, there would be a manifest confusion of identities.

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(2.) The negation of co-ordinates, which is left as implied in the definition, is, in the division, the element which is explicitly set forth. The thorough-going exclusion of the evolved terms from each other, is expressly signified by the alternative words "either" and "or."

(3.) There is affirmation with two terms, a super-ordinate and a subordinate. And, in division, though not in definition, the affirmation is at least double, and may be regarded as being often manifold.

There is presupposed the inclusion of all the evolved terms in the extension of the term given to be divided: "Europeans are men;" "Asiatics are men:" and so on. This is self-evident as to all the positive terms. Each of our evolved terms, then is, virtually, "Men who are Europeans, Asiatics," and so on. But, though we were to pass only from "Europeans" to its contradictory, there would be the same implication: and this view brings out the point with especial distinctness. We must here have the same inclusion: "All Non-Europeans are men:" the contradictory term is, virtually, "men who are Non-Europeans." If the contradictory of "Europeans" were taken without this limitation, it must denote all thinkable objects besides Europeans: it would cease to be truly co-ordinate with Europeans; and the foundation of the division would be overthrown.

In a word, the contradiction, and consequent exclusion, which are thought in the process of dividing, are a contradiction and exclusion not absolute or pure, but only within the sphere or extension of the given term. The objects thought as constituting that sphere, are posited or assumed in the whole process: they constitute what has aptly (though not with this reference) been called the "Universe" of all the propositions which the division either expresses or implies.¹ The terms contradictory of each other, whether explicitly or virtually, are not pure contradictories, but only contradictories within the given sphere.

(4.) The affirmation of inclusion, which, in the definition, is the element explicitly set forth, is, in the division, the element which is left as implied. It lies, indeed, so deeply hidden, that logicians have sometimes overlooked it: a decisive instance is described in the next section.

58. Every division, however complex, is thus reducible, at each of its steps, to a Dichotomy; that is, to the division of a class into two sub-classes opposed to each other by contradiction. The term X, if divisible positively by several terms, of which Y is one, is divisible also by the terms Y and Not-Y. Division by dichotomy.

Dichotomy is not only the normal form of division, the form in which the primary principle appears most clearly. It is also a form of division which has practical uses, and which has, by some thinkers, been adopted as the explicit basis of all classification.² Requiring no positive assumption as to any of the co-ordinates but one, and regarding all the others as merely contradictory of the first, it has been vaunted as the ideal of a process fulfilling the requirements of a pure or *a priori* logic. In confutation of this claim it has been alleged, that the negative co-ordinate is not a pure contradictory of the positive: that when the class X is supposed to be divided into the sub-classes Y and Not-Y, the second sub-class is really "Those X's which are Not-Y's."

¹ De Morgan, *Formal Logic*, p. 38.

² It is enough to instance Peter Ramus among older thinkers, Jeremy Bentham among moderns. The latter name is certainly a symptom that dichotomy cannot be without its practical uses. As to the theoretical difficulties attending it, see especially Trendelenburg.

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tions.

The correct view seems to be that, of which an explanation was attempted in the last section. It is true that both of the co-ordinate terms are positively limited, each of them being in thought included in the superordinate: the members which really divide the class X are these: "The X's which are Y's;" "The X's which are Not-Y's." The contradiction of terms which is gained, a formal and direct contradiction within the sphere of the term given to be divided, is the only contradiction which the case admits; and, within the sphere thought of, it is a pure contradiction.

Even so considered, the facts refute the claim of dichotomy to being an application of the laws of pure thought, without any consideration of matter. But this, as we have seen, is a claim that cannot validly be urged in behalf of any logical law whatever. Least of all is it tenable in regard to laws which, assuming concepts and common terms as given, must presuppose some of the widest and most perplexing of the objective relations, under which only actual knowledge is possible.¹

The five
predi-
cables.

59. In all those logical systems which found their theory of definition and division on the scholastic and Aristotelian opinions, that theory rests, for both processes, on the scheme of the Predicables. The doctrine of the predicables is, in some of its parts, clear and valuable: in others it is difficult alike of explanation and of application. So much of it must here be described, as shall exhibit the bearing of the analysis above proposed on the common rules of definition and division.

Predicables are terms affirmable, as predicates, of other terms. Further, the identical affirmation of singulars being neglected, all predicables are said to be common terms. All the common terms which are affirmatively predicable of others, must import, relatively to the subject of the proposition, one or another of five things. The Predicables are five:—Genus, Species, Difference, Property, and Accident.

(1.) Of any term given as subject, we may affirm, as predicate, its genus. The genus is the widest class in which, according to the view supposed in a given process of thought, the subject can be held as included.

(2.) Of the subject we may affirm its species. The species is any one of several narrower classes, actual or thinkable, which together make up the genus or widest class. In it, as in the genus, the subject is presupposed to be included.

(3.) Of the subject we may affirm a difference. The idea attached to this term has been defined and limited very variously. It receives, probably, the fullest justice when we say, that a difference is an attribute possessed by a whole class, and by that class alone,—that it is an attribute possessed by all the objects of a class, and not by any other objects. It is an attribute universal and peculiar to the objects of a class. Since there are two classes, a more ex-

¹ The dichotomous division has its chief value in the earlier progress of a science: there it is an admirable and often a decisive test. The principle of it, and often its form, enter widely into those processes of applied logic which are described as processes or methods of induction. But its direct use goes no further than allowing us to throw aside, by repeated exclusions, classes of objects which observation has shown to be alien from the purpose of our inquiry. It thus narrows, by successive steps, the ground over which our new observations have to be carried. We commence our scrutiny of the class X, by distributing it into two sub-classes. The one of these is Y, of whose laws or attributes we know something: the other is Not-Y, in regard to which, as yet, we may know nothing. If Y does not satisfy the conditions of our problem, both Y and the containing class X are dismissed from our thoughts. Our field lies now in the class Not-Y; and it may similarly yield Z and Not-Z, to be dealt with as before. This is one of the uses of the process; but its variability, as a groundwork of exclusion, is very great.

tensive and a less extensive (the genus and the species), Doctrine of difference may, correspondingly, be of two several kinds. A generic difference is an attribute universal and peculiar to a genus, and thus distinguishing the genus from all other possible genera: a specific difference is related in the same way to a species. The former is of little or no use.

(4.) Of the subject we may affirm a property. This term, which has been described as variously as the difference, may be explained thus. A property is an attribute possessed by a whole class, but not by that class alone: it is an attribute possessed by all the objects of a class, but possessed also by other objects; it is an attribute universal but not peculiar to the objects of a class. Property, like difference, might be either generic or specific: but property is plainly useless both for definition and for division, unless in the way of preparatory exclusion; therefore the distinction has not been worked out. When the name is applied at all, property seems always to be held specific.

(5.) Of the subject we may affirm an accident. An accident may be said to be an attribute which is possessed by some of the objects of a class, but is not thought of as possessed by all of them. As we are here touching on individuality, accident is always held as specific; the species being, in this scheme, the lowest class, between which and the individual objects no class is thought as intervening. Accidents are further said to be either separable or inseparable. An inseparable accident is an attribute which we cannot, a separable accident is an attribute which we can, think of the subject as not possessing.¹

60. It has often been made a ground of objection to the predicables, that the criteria by which they are distinguished from each other presuppose an objective certainty, an insight into the true nature of the objects compared, which is alike impossible of attainment, and beyond the range of logical scrutiny. The charge is good against not a few of the explanations that have been given, especially of the last three. But the essential character of the scheme is quite in accordance with the fact, that all classification is merely relative, that the placing of objects in classes is nothing more than an operation of thought. The scheme, likewise, is easily useable, within proper logical bounds, as a means of explicating the results of a classification which has been thought out, whether in consonance, or in repugnance, to the real character of the objects.

This much having been premised, we shall readily perceive the bearings of the scheme on definition and division.

(1.) It is observable, in the first place, that the scheme supposes an ordination, of classes or common terms, embracing only two steps, a superordinate and a subordinate,—the genus and the species. It is admitted that more are frequently required; and the terminology has been tortured into elasticity, to make it answer the demand as fully as possible. Genus and species, we are warned, are relative terms: every class is a species in reference to a more extensive class; every class is a genus in reference to a class less extensive. We are allowed to speak of a *summum genus*, and of subaltern genera contained in it; and we receive from some quarters a license to introduce sub-species.

(2.) Still, the range of terminology is palpably inadequate to many scientific purposes. It is especially so for those sciences, which have to distribute and redistribute, by inclusions and exclusions multifariously repeated, a vast number

¹ In regard, here, to difference and property, and also in the next section, obligations are due to an *Examination of some Passages in Dr Whately's Logic*, by George Cornewall Lewis, 1829. Other recent writers, also, in England, have speculated much and acutely on the doctrine of the predicables. They are scrutinized very closely in Mansel's edition of *Aldrich*.

The uses of
the predi-
cables in
definition
and divi-
sion.

Doctrine of inference.

PART III.—THE DOCTRINE OF INFERENCE.

Doctrine of inference.

CHAPTER I.

The Character and Kinds of Inference.

The character of inference.

62. The scholastic logicians described the science as analyzing the products of three mental operations, specifically different: Apprehension, Judgment, and Reasoning. There is a psychological difference between the first two of these, the difference between thought unevolved and thought evolved: and the two kinds of facts yield products differing in form. It is now allowed, generally and rightly, that there is no such difference between judgment and reasoning: the latter operation is constituted by repetitions of the former. Whether we judge or reason, we are alike explicating, in forms yielding propositions, implied relations of given ideas and objects.¹

The forms, however, in which the data may be presented, differ so far as to modify secondarily the forms of explication, and especially by causing diversities in the degree of complexity. It is, therefore, desirable that the most prominent of the explicative forms should be studied separately. There is thus a practical reason for logically treating judgment and predication apart from reasoning or inference, and also for considering severally the leading varieties in the forms of inference.

The only formal difference which can enable us to distinguish, consistently and firmly, between predication and inference, is that which arises out of the distinction between apprehension and judgment. A process in which a proposition is evolved directly from given terms, is a mere predication. Every process in which a proposition is evolved directly from one or more given propositions, must be considered as an inference.

The kinds of inference; immediate and mediate.

63. Every inference contains, in expression as in thought, two parts, that which is given and that which is sought,—the Antecedent and the Consequent. The immediate consequent must be one proposition only. But the antecedent may be either simple or complex: it may be constituted by one proposition only, or by more propositions than one.

An inference, whose antecedent is constituted by one proposition, is an Immediate Inference. There is explicated, in the antecedent, a relation between two terms: there is explicated, in the consequent, between the same two terms, another relation which had been implied in the given one.

An inference, whose antecedent is constituted by more propositions than one, is a Mediate Inference. The simplest case, that in which the antecedent propositions are two, is

¹ "According to these definitions [Locke's], supposing the equality of two lines A and B to be perceived immediately in consequence of their coincidence, the judgment of the mind is intuitive: supposing A to coincide with B, and B with C, the relation between A and C is perceived by reasoning. This is certainly not agreeable to common language. The truth of mathematical axioms has always been supposed to be intuitively obvious: and the first of these affirms, that, if A be equal to B, and B to C, A and C are equal. Admitting, however, Locke's definition to be just, it might easily be shown, that the faculty which perceives the relation between A and C, is the same with the faculty which perceives the relation between A and B and between B and C. When the relation of equality between A and B has once been perceived, A and B become different names for the same thing. That the power of reasoning (or, as it has been sometimes called, the Discursive Faculty), is implied in the powers of intuition and memory, appears also from an examination of the structure of syllogisms. It is impossible to conceive an understanding so formed, as to perceive the truth of the major and minor propositions, and not to perceive the truth of the conclusion." (Dugald Stewart, *Outlines*, part i., sect. 9.)

the Syllogism. The syllogism is the norm of all inferences whose antecedent is more complex; and all such inferences may, by those who think it worth while, be resolved into a series of syllogisms.¹

By syllogistic inference we seek to explicate, in the consequent or conclusion, a relation between two terms. In the premises or antecedent propositions, there is not explicated any relation between those two terms; but in each of them there is explicated a relation between one of the two terms and a third. This third, or mediating term, stands so related to the other two, that the explicated relations between them and it imply a relation between the two themselves; and this is the relation which is explicated in the consequent.

In every process of inference, the consequent is the explicit assertion of an identity or non-identity between its two terms; which identity or non-identity was implied in the antecedent. When the predications are through common terms, the Quality of the consequent, as affirmative or negative, is determined, in the last resort, by reference to the ordination of the terms. The Quantity of each term of the consequent is limited by the quantity of each of the terms of the antecedent; and this quantity is traceable specially to the extension of each of those terms.

CHAPTER II.

Immediate Categorical Inference.

64. All processes of immediate inference, whose validity is determinable by rules purely formal, may be embraced under four kinds. We infer immediately, either by Contraposition, by Subalternation, by Opposition (proper), or by Conversion.

These several kinds of processes stand towards each other in different relations of likeness and unlikeness. They may advantageously be compared from two different points of view.

(1.) The terms being common terms, each proposition, both antecedent and consequent, must be a predication of the subject, either in (or out of) the extension of the predicate, or in (or out of) its comprehension. If the matter of the assertions is not known, the data are not wide enough to indicate in which of the wholes the predication is. But certain points are ascertainable without interpretation of the terms.

In their relation to the two wholes, the first three processes are unlike the fourth. In inference by Contraposition, Subalternation, and Opposition, the antecedent and the consequent predicate in the same whole: both predicate

The modes of immediate inference; and their several characters.

¹ By the older logicians, and by those of this country till recently, the name of Inference, Reasoning, Discourse (Shakspeare's "*discourse of reason*"), was limited to the syllogism and processes yet more complex. The extension of it, so as to embrace the processes here called immediate inferences, seems to have been first made by some of the German logicians after Wolf: it was adopted by Kant, who has been followed in this point by all his countrymen. By more than one of these, however, it has been shown, that his distinction of the two kinds, as being respectively inferences of the understanding, and inferences of the reason, is not so much as consistent with his own psychology.

The secondary difference between inference and simple predication being recognized, the old limitation of the former name not only is incorrect, but tends to disguise from us the real character of inferences which are immediate. Any valid reason for refusing the name to processes of this sort, would tell with equal force against the syllogism.

Doctrine of inference. either in extension or in comprehension. In inference by Conversion, the antecedent being a predication in one whole, the consequent is a predication in the other: the process consists, as has already been alleged, in the transference of predication from extension into comprehension, or contrariwise.

(2.) The processes fall into other groups, when we consider the relation of truth or falsehood between antecedent and consequent. In this respect the first, second, and fourth kinds are unlike the third.

Contraposition, Subalternation, and Conversion, yield consequents, whose truth or falsehood, when it is determinable, agrees with the truth or falsehood of the antecedent. If the antecedent is admitted as true, the consequent must be admitted: if the antecedent is denied, the consequent must be denied. Opposition (proper) yields consequents, whose truth or falsehood, when it is determinable, is opposed to the truth or falsehood of the antecedent. If the antecedent is admitted, the consequent must be denied: if the antecedent is denied, the consequent must be admitted.¹

Inference by contraposition.

65. By Contraposition we gain a consequent, which must be admitted if the antecedent is admitted, and denied if the antecedent is denied.

We shall call the antecedent the *Contraponend*, the consequent the *Contraposita*.²

The process consists in transforming, through the law of non-contradiction, a given Affirmative into a Negative, which is accepted as equivalent or equipollent, or a given Negative into an equivalent Affirmative. In both cases the method is, to substitute for the predicate the term which is its contradictory, and then, as a necessary consequence, to change the character of the copula.³ The principle is self-evident: what is done is to apply one of the logical axioms in its simplest shape. If, of a given term, we can affirm another, we must be entitled, of the first term, to deny a term which is contradictory of that other: if, of a given term, we can deny another, we must be entitled, of the first term, to affirm the contradictory of that other. If the X's are contained in the sphere of the Y's, they must be excluded from the whole of the sphere of the objects which are Not-Y's: if the X's are excluded from the sphere of the Y's, they must be contained in the sphere of the objects which are Not-Y's.

The affirmative becomes a negative, when, instead of

¹ Those who refuse to these processes the name of Inference, rest on this allegation; that, since the terms of the antecedent and those of the consequent are the same, the two propositions must merely express the same thought in two different forms.—Of Conversion this is plainly not true. It is far from being a matter of indifference to the real character of a judgment, which of its terms is taken as subject, and which as predicate: so much is evident without reference to the wholes of the concept, the examination of which founds more deeply the reasons of the difference. As to Opposition proper, the case is perhaps still clearer. We cannot be said to express the same judgment, in enunciating one proposition which is true, and another which, however closely related to the former, must be false. In respect to Subalternation, the question is narrower, lying merely between the "all" and the "some" of the subject. But here, likewise, the doubt falls away, when we remember that, on the strict analysis which we are bound to aim at, that which is really either subject or predicate, is not a common term which is distributable, but that term peremptorily fixed as being either distributed or undistributed. "All X's," and "some X's," are the names of two several sets of objects. If there be any of the immediate inferences whose claim to the inferential character is reasonably doubtful, it is Contraposition, to which we now pass.

² The caution must be given that, in several of our English books of logic, the name of contraposition is given, not to this process, but to a twofold one, in which there really take place, first, contraposition; secondly, conversion of the contraposita. We shall speak of this complex process as Conversion through Contraposition.

³ The subject, as denoting the notion or object given to be determined, must remain unchanged. It cannot be displaced by its contradictory, until it has first, by conversion, become predicate.

affirming the predicate, we deny its contradictory. Thus, Doctrine of inference. "All X's are some Y's" (A), becomes "The X's are not any Not-Y's" (E). The negative becomes affirmative, when, instead of denying the predicate, we affirm its contradictory. Thus, "Some X's are not any Y's" (O), becomes "Some X's are some Not-Y's" (I). There is in this way a possibility of contraposition, in both directions, between A and E, between I and O.¹

¹ This is a process which serves so many uses in the analysis of the syllogism, that it demands particular notice. The doubt, however, as to its claim to being held a genuine inference, is raised at once by some of the phrases which have just been applied to it. Two propositions, strictly and absolutely equivalent, cannot but be mere varieties of expression for one and the same judgment. But, on the other hand, it is questionable whether any two propositions do stand in such a relation. The minute anatomy of thought would exhibit fine differences in the character of the acts, even between cases of equivalence through synonymous terms, or through other variations not logically cognizable. One judgment is not in all points necessarily identical with another, though the two compare the same objects: the identity fails, as soon as there creeps in the slightest discrepancy between the relations in which the objects are thought.

It is fairly maintainable, that the contraponend and the contraposita are not absolutely equivalent,—that each of them brings out distinctly an element of thought which is merely implied in the other. I have, it may indeed be said, the same thought, a thought constituted by the very same factors, when I place X somewhere or other in the positive and limited sphere of the Y's, and when I exclude it from all points of the negative and undetermined sphere of the Not-Y's. Thus much may be admitted, that the two thoughts grasp one and the same relation of the objects. But they apprehend it from two opposite points of view. Subjectively or psychologically, it is not the same act of thought that places an object in one sphere and out of another. Objectively, again, or with reference to the products of the acts, the reality of a difference is made probable, if not absolutely certain, when we attempt using the one proposition or the other, alternatively, as a premise in a syllogism. Each of the two places the terms in a certain relation, not yielded by the other, to the other terms of the argument. Sometimes, therefore, the one proposition enables us to construct a good argument, while the other would generate a bad one: at other times the argument admits only one fixed form, if the one proposition is adopted, but is made flexible through the substitution of the other.

The question, as to the true relation between the contraponend and the contraposita, was pressed on modern logicians by Kant's "Categories of the Understanding." He recognized, in respect of quality, not only the affirmative judgment (X—is—Y), and the negative (X—is not—Y); but also the limitative or infinite (X—is—Not-Y). The negatively-determined term, (as "not-man"), was admitted by Aristotle (*De Enunciatione, passim*): and from his name for it, *ἐναντιόλογος*, Boethius, and after him the schoolmen, called it (too widely) an "infinite term."

The old writers, moreover, acknowledged the infinite term as a *datum*, not for the predicate only, but also for the *subject*. When such a term does become the subject, the proposition has a peculiar character: it represents the explicit assertion of the ordinary "exceptives." "All things except the X's are Y's," gives, directly, "All not-X's are Y's."

It is curious to mark those ancient forms re-appearing, as data, in two recent systems.

1. Exceptive propositions give the foundation to Dr Boole's ingenious method of resolving (as others have attempted to resolve otherwise) all assertion into affirmation. His formula, "Y = X — Z," is interpretable as "The Y's—are—those X's which are not Z's." If, then, it is presupposed (as his notation postulates), that X is a genus containing the two species Y and Z, the assertion may take this form: "The Y's—are—Not-Z's," which is equivalent to denying a term of its co-ordinate.

2. The infinite term, again, yields the characteristic forms to the scheme of predication worked out by Professor De Morgan, through the terms which he inconveniently calls *contraries* (i.e., contradictories in the received nomenclature, as X and Not-X). Admitting "infinities," both as subjects and as predicates, he gains, as data for inference, eight "standard varieties of assertion," all treatable as A, E, I, O. The first four have, as subjects, positive terms (X): the last four have infinite subjects (not-X), and are virtually exceptives. Mr De Morgan is perfectly correct in deriving from each of his eight leading propositions two others, which thus make up his "contranumeral" forms of predication to twenty-four. Only, not distinguishing between conversion proper and conversion through

Doctrine of inference.

The kinds of opposition as commonly described.

66. In a large majority of logical systems, the name of Opposition is so applied, as to include Subalternation along with those other three relations to which, here, the name is limited. The three are these: Contrariety, Sub-contrariety, and Contradiction. The outline of the scheme, thus embracing all the four, may be used as an introduction to our separate examination of each.

No propositional forms but A, E, I, and O, being admitted, we can, with any two common terms, form four propositions only. Any two of these are said to be opposed to each other, in respect that they must differ either in quantity or in quality, or in both. The kinds of opposition thus appearing are four.

I. Propositions agreeing in quality, but differing in quantity, are called, in reference to each other, Subalterns. The universal is the Subalternant, the particular the Subalternate. Any two terms furnish two pairs of subalterns: A and I, E and O. The same laws govern both pairs: hence the relation has only one name.

II. Any two terms furnish also two pairs of propositions, agreeing in quantity, but differing in quality. The same laws do not govern both pairs: there are two relations, and hence two names. (1.) The two universals, A and E, are called Contraries. (2.) The two particulars, I and O, are called Subcontraries.

III. Propositions differing both in quantity and in quality are called Contradictories. Any two terms furnish two such pairs: A and O, E and I. There is here but one relation, and hence one name.

It is convenient to be thus enabled to look, at one glance, over all the possible combinations of the same two terms in assertions of inclusion and exclusion. The survey is usually facilitated, in the books, by the placing of the four symbolic letters in the angles of a square; the universals standing above and the particulars below, affirmatives on the left hand and negatives on the right. The relations or affections of each two propositions are then expressible by names placed in the sides of the square and in its diagonals.¹

But subalternation, yielding a consequent consistent with the antecedent, and the other relations, yielding consequents inconsistent with the antecedents, ought, as modes of inference, to be in some way distinguished from each other: and the name of opposition, aptly designating the last three, is hardly germane to the first.

leaps in argument, how they are traceable to the law of non-contradiction in one or more of its phases.

Doctrine of inference.

That which we seek to infer through opposition, is not a consequent consistent with the antecedent; not a consequent whose truth is involved in the truth, or its falsehood in the falsehood, of the antecedent. We seek a consequent inconsistent with the antecedent,—a consequent so related to the antecedent, that the truth of the latter shall involve the falsehood of the former, and the falsehood of the latter the truth of the former. In a word, our two propositions ought to be so related, that the laws of difference and excluded middle shall strike at them directly: they should be peremptorily and necessarily contradictory of each other; like the assertion, "X is Y," as compared with the assertion, "X is Not-Y."

But our subject, being a common term, may be either distributed or undistributed. This variability takes away the power of applying the two laws with the same simple universality, in which they govern propositions whose subjects are singulars. We have to take account of the identity and non-identity of classes and parts of classes, in all the modes of combination allowed by the four propositional forms. Having completed this inspection, we find that the contradiction between antecedent and consequent is not universally and formally guaranteed, unless when the two propositions have a maximum of difference, that is, unless when they differ both in quality and in quantity.

Accordingly, propositions thus related are called Contradictories by way of eminence. This kind of opposition leads always from affirmation to denial, and from denial to affirmation. Its rules, if first established, facilitate the proof of the rules governing the other two: Contrary opposition, which leads only from affirmation to denial; Subcontrary opposition, which leads only from denial to affirmation. Subalternation, which leads from affirmation to affirmation, or from denial to denial, will find its place afterwards, and complete our review of the relations connecting all propositions framed with the same subject and the same predicate.

68. That relation of propositions which, as yielding the only peremptory inconsistency, is emphatically called Contradiction, subsists between A and O, and between E and I. Of any two contradictory propositions, the one must be true and the other false. If the antecedent is admitted, the consequent must be denied: if the antecedent is denied, the consequent must be admitted.

Inference by contradictory opposition.

If we had to seek the contradictory of a given proposition, the problem would in effect be this: Given an assertion which is assumed to be either true or false; to find the narrowest assertion that would, in all possible instances, be inconsistent with the assumption.

The solution might be attained very easily through the laws which govern concepts. If we start from one of the universals as true, we assume that a whole class of objects have (or want) a certain attribute. We have thus a proposition either in A or in E. Evidently inconsistent with this would be the truth of the opposite universal (E or A), asserting that none of the objects have (or want) the attribute. But, if our first universal were assumed to be false, there would not be a necessary inconsistency between this assumption and the truth of the opposite universal. Though we have denied that all the objects have (or want) the attribute, we may still be able either to affirm, or to deny, that none of them have (or want) it. A thorough-going inconsistency, therefore, does not subsist between the universals. But there is such an inconsistency between a universal and the opposite particular. If it be true that all the objects have the attribute, it must be false that some of them have it not: if it be false that all the objects have it, it must be true that some of them have it not. The con-

The general character of inference by opposition proper.

67. The rules which determine the deducible truth or falsehood of the consequents gained through Opposition proper, are, for all the modes, so very obvious, that in most of our English treatises they are laid down without proof. But it is right to show, as briefly as may be, yet without

contraposition, he leaves in implication, in each of his deductions, one step, which, if supplied, would enable us to make all his inferences through the received rules. The omitted step is always a simple converse, from which his second consequent is deducible: for A and O it is the converse of the first consequent, for E and I the converse of the given antecedent. His first and eighth forms will illustrate both cases. 1. "All X's—are—Y's (A)=Contraposita: The X's—are not—Not-Y's (E)=Converses: The Not-Y's—are not—X's (E)=Contraposita: All Not-Y's—are—Not-X's (A)." 2. "Some Not-X's—are—Not-Y's (I)=Contraposita: Some Not X's—are not—Y's (O)=Converse of the I: Some Not-Y's—are—Not-X's (I)=Contraposita: Some Not-Y's—are not—X's (O)." All Mr De Morgan's eight contranominals are set forth by Boethius, in his *Introductio in Syllogismos Categoricos* (Opera, ed. 1570, p. 570, and elsewhere).

¹ We very often speak of assertions which we hold to be contradictory of each other, as being "diametrically opposed." The phrase is one of many which have migrated into common life from the scholastic cloisters. Substitute, for the square in whose angles the symbolic letters are now usually placed, a circle described about it. The diagonals of the square become *diameters* of the circle; and the pairs of contradictories stand at their extremities.

Doctrine of inference. tradition keeps its hold, whether we take, as our antecedent, the universal or the particular.

The leaning of affirmation and negation on identity and difference, and the necessary determination of thought towards the one or the other, may be brought to light as affecting these results, by the scrutiny of an example. The A and O will suffice: "All X's are some Y's" (A); "Some X's are not any Y's" (O).

The A is interpretable thus: "All the objects we call X—are identical with—some of the objects we call Y." The O is thus interpretable: "Some of the objects we call X—are non-identical with—all the objects we call Y."

In the first place, both of these assertions cannot be true. If we are entitled to affirm that all the objects X are the same objects which (with others) we call Y, we are much within the mark of safety, when we deny that some of the objects X are different objects from all those which we call Y. If we are entitled to affirm that some of the objects X are different objects from all those we call Y, we cannot possibly affirm also, that all the objects X are the same objects with some of those we call Y. If both assertions were true, there would be some X's which are identical with some Y's, yet non-identical with any Y's. We should, in effect, have affirmed, of the same subject, two contradictory predicates, Y and Not-Y.

On the other hand, both of the assertions cannot be false. Every thinkable object must be either Y or Not-Y. All the X's must either be some of the Y's, that is, identical with some of the objects in the sphere of Y; or they must be some of the Not-Y's, that is, some of the objects which are beyond that sphere.

In short, the one of the two assertions must be true, the other false. If the antecedent is given as true, we do, in other words, affirm the identity or non-identity of the objects designated by the terms: the consequent in this case involves a denial of that identity or non-identity. If the antecedent is given as false, we thus deny the identity or non-identity of the objects: and in this case the consequent involves an affirmation of that identity or non-identity.

Inference by contrary opposition.

69. The relation of Contrariety subsists between A and E. Of two contrary propositions, both cannot be true, but both may be false. If the antecedent is admitted, the consequent must be denied: but though the antecedent should be denied, the consequent is not therefore necessarily admitted.

(1.) The objects denoted by the term which is the subject are the same in the two propositions: "All the X's are Y's" (A); "The X's are not Y's" (E). If both were true, the two would coalesce into the one self-contradictory assertion, that the X's are both Y's and Not-Y's. Therefore, if either is true, the other must be false.

(2.) The assumption that A is false, amounts to this only: it is not true that all the objects of a class possess a certain attribute. But this leaves open either of two cases. First, it may be true that none of the objects of the class possess the attribute; that is, in other words, the E is true. Secondly, it may be true, that some of the objects do possess the attribute; that is, the I is true. But if the I is true, its contradictory must be false: and that contradictory is the E. The same proof would be applicable if we made the E our starting-point. Therefore, though one of the contraries is false, the other may be either false or true.

Inference by subcontrary opposition.

70. The relation of Subcontrariety subsists between I and O. Of two subcontrary propositions, both cannot be false, but both may be true. If the antecedent is denied, the consequent must be admitted: but though the antecedent should be admitted, the consequent is not therefore necessarily denied.

Our propositions are these: "Some X's are Y's" (I); "Some X's are not Y's" (O). Evidently there are here the

narrowest possible grounds of determination. The interpretation of the sign of quantitative limitation must be narrowly looked to. Doctrine of inference.

(1.) If the subject were quantitatively definite, it would signify, for each of the two propositions, "Certain X's;" "Those X's of which I now think." We should, on that supposition, have to demand an answer to the question; whether the X's thought of in the I are the same X's which are thought of in the O, or a different group of X's. If they are the same X's, the two propositions have the same subject, and are inconsistent. If the X's are different X's, the two propositions have different subjects; and an assertion in regard to the one subject determines nothing for an assertion in regard to the other. In effect, the term "Certain X's" is, as was noted in a preceding section, virtually equivalent to a common term distributed: the propositions are in substance universal, both of them, however, having, as subjects, terms which are ambiguous.

(2.) The subject being quantitatively indefinite, according to the orthodox logical interpretation of the sign, the case stands quite otherwise. The subject constitutes, of the objects denotable by the subject-term, a part which is in every direction indefinite: the part is some or other, a few or many, some and perhaps all, but without our being entitled positively to assume all.

First, then, let either of the propositions be assumed to be false. It is false that "Some X's are Y's" (I). But, by the law of excluded middle, all the X's, like all other thinkable things, must either be or not be Y's. Since, then, we have denied the assertion that some of them are Y's, we are driven on the assertion that some of them are not Y's. If the I is false, the O must be true. Starting from the O, we should reach the same result in regard to the I.—The demonstration may be made more exact, if we choose to anticipate the doctrine of subalternation. It is false that "Some X's are Y's" (I): therefore the contradictory of the I must be true; that is, it is true that "The X's (any) are not Y's" (E). Therefore the subalternate of the E must be true; that is, it is true that "Some of the X's are not Y's" (O).

Next, let either of the propositions be given as true. It is true that "Some X's are Y's" (I). Nothing is thus given as to the whole class X: for aught we know, all the X's may be Y's, or some of them may not be Y's. If "All the X's are Y's" (A), the O will be false, as being the contradictory of A: if "Some of the X's are not Y's," this is a direct assertion of the truth of the O.

71. The relation of Subalternation subsists between A and I, and between E and O. By subalternation we may by subinfer, either from whole to part, or from part to whole; from subalternant to subalternate, or from subalternate to subalternant.

In inference from Subalternant to Subalternate, if the antecedent is admitted, the consequent must be admitted. In inference from Subalternate to Subalternant, if the antecedent is denied, the consequent must be denied.

The peremptory consequences go no further. If the subalternant, as antecedent, is denied, the subalternate, as consequent, is not therefore, necessarily, either denied or admitted. If the subalternate, as antecedent, is admitted, the subalternant, as consequent, is not therefore, necessarily, either admitted or denied.

Let our propositions be the affirmatives: "All the X's are Y's" (A); "Some of the X's are Y's" (I). None of the preceding modes of inference lean, so openly as this, on the laws of predication through ordained terms. From these laws, indeed, the rules might be directly deduced. The "all X's" and "some X's," stand really in the relation of superordinate and subordinate. If the "some X's" had a name, as "all Z's," they would constitute a sub-class in

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cluded in the class X; and, if the fact were so, all the cases both of affirmation and of denial would be regulated, directly, by the canons laid down for predication in extension. But subalternation stands on the hypothesis, that the class denoted by the subject has not been divided into sub-classes; and, on this footing, the rules may be justified by an immediate appeal to the elementary and universal principles of predication.

(1.) Of two subaltern propositions, both may be true, or both false.

Formally, we cannot determine which of the alternatives holds. If all the objects denotable by the subject-term are denotable also by the predicate-term, the A is true; and consequently the I also is true, the particular sign having its usual logical meaning. If none of the objects denotable by the subject-term are denotable by the predicate-term, we should contradict this assertion by affirming the predicate of the subject either in whole or in part: A and I would, both of them, be false. The negatives are readily determinable in the same way.

(2.) If the subalternant is true, the subalternate must be true: if the subalternant is false, the subalternate may be either false or true.

The first section of this rule follows from the character of the logical "some," of which we have just been reminded. This, the most obvious law of subalternation, is also that which is most widely applicable. But suppose A to be false: it is false that "All the X's are Y's." This assumption is consistent with the supposition that the E is true; and, if so, I, the contradictory of E, is false. It is consistent also with the supposition that the I is true: though it is not true that all the objects of a class have the attribute Y, it may be true that some of them have it.

(3.) If the subalternate is false, the subalternant must be false; if the subalternate is true, the subalternant may be either true or false.

On the one hand, suppose the subalternate I to be false. Then its contradictory E must be true; and A, the contrary of E, must be false. Or take it thus: By hypothesis, the I is false. Assume the A to be true; therefore all its subalternates are true, which is contradictory of the hypothesis: therefore, by the law of excluded middle, the A must be false.

On the other hand, suppose the subalternate I to be true. Having learned nothing as to the whole class of X's, we are at liberty to assert also that the A is true. Or, with equal right, we may assert that O, the subcontrary, is true; but, if so, the A, its contradictory, must be false.

The received rules of inference by conversion.

72. By Conversion we gain a consequent, which must be admitted if the antecedent is admitted. When the conversion is thorough, the consequent must also be denied if the antecedent is denied. Thorough conversion is reciprocal. But a defect in the received method of converting A makes it an exception: the denial of A, as antecedent, does not enforce the denial of the proposition usually accepted as its consequent.

The common doctrine of Conversion may be explained as follows:—

Conversion of a proposition is the transposition of its terms. The antecedent is called the Convertend, or Exposita (the proposition set forth to be converted); the consequent is called the Converse (the given proposition converted). The formal rule is this: that no term which was undistributed in the convertend shall be distributed in the converse. The reason is plain. Conversion is an illative or inferential process: it aims, in the narrowest view, at deducing a proposition which must be true if the given proposition is true; and from an assertion of "some" given as true, we cannot deduce an assertion of "all" as true. The received propositional forms, A, E, I, O, being regarded as

the only cognizable forms, the non-distribution of terms in some of these makes it impossible, that each of them shall yield a converse of the same form as the convertend. Accordingly, three methods of conversion are laid down, as applicable severally to the several forms: Simple Conversion; Conversion *Per Accidens*; Conversion by (properly through or after) Contraposition.

(1.) Simple Conversion is a mere transposition of the terms of the convertend, both quantity and quality remaining unchanged. We may thus convert E, which, distributing both terms, yields another E. The given predicate, being distributed, becomes legitimately the subject of a universal: the given subject, being distributed, becomes legitimately the predicate of a negative. Thus, also, we may convert I, which, distributing neither term, yields another I. The predicate, though undistributed, is legitimately usable as the subject of a particular: the subject, though undistributed, is legitimately usable as the predicate of an affirmative. Thus: "The X's are not any Y's," gives, "The Y's are not any X's." "Some X's are some Y's," gives, "Some Y's are some X's."

(2.) Conversion *per accidens* is a transposition of the terms of the convertend, without change of the quality, but with a limitation of the quantity from universal to particular. A is not convertible simply into an A, because its predicate is undistributed. But we may convert it, *per accidens*, into an I: its predicate, though undistributed, may become the subject of a particular. "All X's are some Y's," cannot become "All Y's are X's;" but it does give, "Some Y's are X's." Thus, also, it is said, we may convert E into O. But the process yielding the O is really double: its second step is an inference from subalternant to subalternate. "The X's are not Y's," gives, by simple conversion, "The Y's are not X's;" whence comes, by subalternation, "Some Y's are not X's." For E, indeed, the process is seldom, if ever, put to use.

(3.) Conversion through Contraposition is truly, like the conversion of E into O, a double process. From the convertend there is first inferred an equivalent *contraposita*; and then this *contraposita* is converted. This complexity must be exhibited, if we are to explain rightly the character of the process. Being usually required only for O and A, it is treated in most of the books with exclusive reference to them. But it covers E likewise. (1.) O cannot be converted directly. For its subject, being undistributed, cannot become the predicate of a negative; and the attempt to infer an affirmative with the same terms, would be self-evidently absurd. But, the negative sign of the copula being transferred to the predicate, we have thus inferred, from the O, its *contraposita*, an equipollent I: "Some X's are not Y's," becomes "Some X's—are—(some) Not-Y's." This *contraposita* I is then simply converted into another I: "Some Not-Y's are X's." (2.) A, though convertible directly, *per accidens*, is also convertible through contraposition. We first contrapose, by substituting, for the affirmation of the predicate, the denial of its contradictory, which transforms A into E: "All X's are (some) Y's," gives, "The X's—are not—(any) Not-Y's." The *contraposita* E is then simply converted into E: "The Not-Y's—are not—(any) X's." (3.) E also is evidently so convertible: its *contraposita* is an A, the converse of which, *per accidens*, is an I. But, for E, no use is made of the process. (4.) I is evidently not so convertible: its *contraposita* would be an O; which does not admit direct conversion.¹

¹ The Rules of Conversion, by all its three methods, were symbolized by the schoolmen in two mnemonic lines, in which the vowels of the nominative words designate the forms A, E, I, O.

"Fecit simpliciter convertitur; eva per accid.;
Faxo (or asto) per contra.: sic fit conversio tota."

If, the antecedent being true, the consequent is therefore true, why

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Some logicians, both ancient and modern, have denied, on insufficient grounds, the competency of conversion through contraposition. They hold O to be inconvertible; and, of course, they decline to use the indirect process for A. They thus narrow our power of dealing with the two most difficult of the syllogistic moods.

Systematization of the rules of conversion.

73. The received doctrine, when reduced thoroughly to a system, gives the following results:—

(1.) There are really no more than two methods of conversion: conversion simple, applicable to E and I; conversion *per accidens*, applicable to A. O is not convertible by either method.

(2.) Every proposition admits contraposition; and of every form, except I, the contraposita is convertible. O becomes thus convertible indirectly, but not otherwise: its contraposita, an I, may be converted simply. A and E also are convertible through contraposition: the contraposita of A, being an E, is convertible simply; the contraposita of E, being an A, is convertible *per accidens*.

(3.) Since the converse of E admits a subalternant, E is thus indirectly convertible into O.

(4.) The four received forms of propositions thus admit, either directly or indirectly, the following converses, all of which are currently recognized:—A yields directly I, indirectly E; E yields directly E, indirectly O; I yields directly I; O yields indirectly I. E yields also, indirectly, an I, not currently recognized.

The rule by which these processes are guarded, and the directions given for its use, are traceable upwards, by a very short resolution, to the law of non-contradiction, as brought to bear on predication through common terms. The objects denoted by the subject (of which the quantitative sign is an integral part), and the objects denoted by the predicate (the quantitative sign again considered), are thought as identical when the convertend is affirmative, as non-identical when the convertend is negative. If both convertend and converse affirm when the objects are thought as identical, and deny when the objects are thought as non-identical, each of the terms may be indifferently subject or predicate. The rule, as to distribution of terms, simply prohibits us from interpolating, through either term of the converse, assertion in regard to any objects not named in the convertend.

Supplement to the doctrine of conversion.

74. The strict application of the law of identity shows, at a glance, that the converses of E, I, and O, must be false if the convertends are false. It shows also that, and how, this consequence should, but, on the ordinary interpretation of I, does not, follow as to the converse of A.

Whenever "all" is given in the convertend, we are unquestionably entitled to "all" in the converse. We have a right to infer, in converting A, not I merely, but I². "All X's—are—some Y's," being an affirmation of the identity of subject and predicate, yields, lawfully, "Some Y's—are—all X's." If the A is denied, so must the I² be: if it is denied that "All men—are—(some) liars," it must be denied that "Some liars—are—all men (the only men)." But, I² being unacknowledged in the orthodox scheme, the recognized and only possible converse of A is I: and, manifestly, though it were denied that "All the X's are some Y's," this does not necessitate the denial that "Some Y's are some X's."

Is the received converse of A, then, logically incorrect? Not in the least. The case is only that, read as an I, it

alleges less widely than it might: the fault, like every other¹ in the current systems, lies on the side of safety.

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The truth is, that, in the conversion of A into I, there lies hidden a process of subalternation. The A yields I² as its exhaustive converse, which is true if the convertend be true, but false if the convertend be false. The I, which is usually accepted as the converse of the A, is virtually a subalternant of this full converse: it is true, by the principle of subalternation, if its subalternant is true; but it may, by the same principle, be either true or false if its subalternant be false.¹

The process of conversion has thus been considered from the common position, with the one exception of A. Its laws have been referred to the principle of non-contradiction, as it affects propositions regarded without the analytic dissection of the wholes of the common term. So long as we do not seek to apply the process to any use beyond the determination of the consequent, no deeper analysis is required.

But, when we have to consider the bearing of conversion on the syllogism, it will become imperatively necessary to look at the process from a more commanding station. Its true character, as being a transference of predication from extension to comprehension, or contrariwise, will then come out with irresistible force of evidence.

75. In the preceding treatment of the doctrine of immediate inference, no predicative forms are accepted as data, except the received propositions of inclusion and exclusion, from and to

Inferences from and to propositions of constitution.

¹ This cryptic process may be brought to the surface without I², but still more readily through it.

(1.) Let both A and I be given: "All the X's are some Y's," and "Some X's are some Y's." The I, "Some Y's are some X's," which we are required to accept as the converse of the former, is the full and genuine converse of the latter. Surely it will not be maintained that the subalternant can yield no wider inference than the subalternant. Our process implies our having first inferred an I from A by subalternation, and then simply converted the I. It is thus, in fact, that the conversion of A into I is justified by Boethius. (*Opera*, p. 575.)

(2.) If I² is taken into account, there emerges a relation of the propositions, which is disguised by the imperfection of the quantitative signs, yet is exactly conformable to admitted logical laws. I is virtually a subalternant of I², and is therefore inferrible from it. Given I²: "Some X's—are—all Y's (the only Y's)," we find I: "Some X's (fewer than the first 'some')—are—some Y's." If a part of the X's constitute a whole class Y, then, plainly, a part of that part of the X's must constitute a part of the class Y. When we compare our two propositions, we discover that our indeterminate particularity, though still indeterminate, has shrunk in the higher limit of its dimensions. The "some X's" of our I are only "some of the some X's" of our I². It is true that "Some mortal creatures are all (the only) human beings:" and what follows, on the principle of subalternation, is, that "Some of those some mortal creatures are some human beings."

The question raised by the assumed falsehood of A is here equally easy of decision. There is no inconsistency in our holding I² to be false (as it must be, if the convertend A is so), and in yet finding it impossible to determine whether the subalternant I be false or true. Our denying an assertion, made as to the whole of the first and larger part of our X's, does not give the slightest reason for denying the same assertion as to a part of that part.

In that aspect of the case which was first presented, the conversion of A into I was alleged to imply a subalternation followed by a conversion: in the other aspect, it has been alleged to imply a conversion followed by a subalternation. The two views, though the latter more directly than the other, conduct us to the same result. It is demonstrable, on grounds purely logical, that, when we accept, as a conversion of A, its transformation into an I, the inference covers a part of the subject-class, which, although indeterminate, is yet smaller, possibly or actually, and must necessarily be thought as smaller, than the part as to which the inference might have been drawn. If, therefore, in a process of reasoning, an A is one of our steps, and if, requiring to convert it, we content ourselves with I, we are indeed safe as to the subsequent progress of the argument; but we have narrowed our data in a way which may force a narrowing of our ultimate result.

do geometers prove both a theorem and its converse? Because the proposition which they (and all of us, sometimes, in common speech) call a converse, is not a logical converse. It has not either term the same with either term of the proposition which is nominally its *exposita*.

Doctrine of A, I, E, O. Nor has it been necessary to take account of inference. any other forms, unless in showing that I^2 gives the only full expression for the converse of A.

If the two propositions of constitution, A^2 and I^2 , are combined, first with each other, and afterwards with each of the four received forms, there appear nine pairs of predications, involving a new series of relations. These are singularly barren as grounds of immediate inference. The fact intimates, not only how seldom such assertions can enter into our ordinary trains of thinking; but likewise how little reason there is for hoping, that their incorporation with the received scheme would materially increase the applicabilities of logical science.

One striking point is this. No two of the new pairs of propositions would be formally contradictories: no two are so related, that the one must be true and the other false. We gain only relations corresponding to subalternation and contrariety, with one which resembles subcontrariety.

This supplementary scheme of inference, in short, is philosophically interesting rather than practically useful. The subjoined summary will indicate all the results that can here be dealt with.*

* The details may be gleaned from the table given (with warning that it "may not be quite accurate in details"), by Hamilton, *Discussions*, Appendix, ii., p. 637. In that table, a distinct separation is made, between the relations arising out of the two interpretations of the limitative sign, as "some at least," and "some at most;" both of which Sir W. Hamilton desires to introduce into the science. Neither of the interpretations seems to be excluded by Mr Thomson in his "Tables of Opposition of Judgments." (*Laws of Thought*, ed. 1854, p. 197.) Notice has already been given, that, in the present treatise, the received interpretation, "some at least," is steadily adhered to: if there be any deviation, it is an oversight.

1. The following four pairs of propositions are virtually contraries: A and I^2 , A^2 and E, A^2 and O, I^2 and E. On the assumption, that the "some" is "some at least," both cannot be true, but both may be false. We may infer, therefore, from the truth of either to the falsehood of the other, but not inversely.

2. On the same assumption, these two pairs are virtually subalterns: A^2 is subalternant, I is subalternate; I^2 is subalternant, I is subalternate. If the subalternant is true, the subalternate is true, and may be inferred from it. If "All X's are all Y's," it follows, that "Some X's are some Y's," the quantity of both terms is expressly limited. If, again, "Some X's are all Y's," it follows, that "Some X's are some Y's." The quantity of the predicate is expressly limited, but that of the subject also is limited in reality: the "some X's" which are identical with "some Y's," are not thought as being as extensive with, but as being possibly only a part of, the "some X's" which are identical with "all Y's."

In regard, however, to those six pairs of propositions, the opposite interpretation of the "some" would leave the relations unaffected. As to the other three pairs, the case stands quite otherwise.

3. In either view, I^2 and O approach the relation of subcontraries. (1.) If the "some" is "some at least," the two propositions stand thus:—If I^2 is true, O must be false; admitting I^2 , therefore, we may inferentially deny O. But, if O is true, I^2 may be either true or false. And both may be false. (2.) If the "some" is "some at most," then, since this excludes "all," I^2 being true, O is inferentially true likewise. If it be assumed as true (see Hamilton, p. 636), that "Some dogs (but not all) are all animals that bark," it must follow, as true, that "Some dogs (but not all) are not any animals that bark."

4. The two pairs still to be considered are, A^2 and A, A^2 and I^2 . The relations of both are troublesome. By Mr Thomson these pairs are described as "inconsistent," (that is, as affirmatives standing in the relation of contrariety). In Hamilton's table, the pairs are "inconsistent" on the assumption of "some at most:" on the other assumption, they are not marked at all; but neither is any inference stated as admissible from the one to the other. In other passages, however, Sir W. Hamilton seems to disallow the consistency of A^2 and A, from which doctrine would follow the inconsistency of the other pair.

(1.) If the "some" is "some at most," the pairs stand, plainly, in relations of contrariety; the causes of the inconsistency lying more or less deep according to the quantity of the terms. (2.) If the "some" is "some at least," it is not easy to discover sufficient reasons for refusing to classify the pairs with the other subalterns. Nor, in this view, in the first place, A is only an incomplete or

cautious assertion of A^2 , and may safely be inferred from it: if it is true that "All X's are all Y's," it must be true that "All X's are at least some of the Y's, and perhaps all of them." Or we might take the question thus: If the X's constitute the class Y, every individual X must be identical with some one or other of the Y's. This, perhaps, is the plainer case of the two. If, again, the limitation, which here falls on the predicate, were to be transferred to the subject, the A^2 would yield I^2 . "Some at least, and perhaps all, the X's, are all Y's." But as to this derivative assertion (I^2), even though we should be satisfied that it sustains the formal test, we cannot but see that it serves no use. The limitation of the predicate had given us, in the A, an assertion easily thinkable as contained under the admitted A^2 : but the limitation of the subject is virtually a thinking away of our A^2 , and the substituting, in its place, of a judgment which leaves the A^2 as doubted.

This glance towards the practical side, suggests yet a wider consideration. Using words in their ordinary meanings, no one would dream of inferring, from A^2 , either A or I^2 . But why? Because our spontaneous "some" is always "some at most, some not all." In any use, therefore, which is not guarded by technical rules, the pairs would do duty as contraries.

Still, it must be added (not without reluctance), the more cautious interpretation of the "some" is, in the first place, the only one that can be brought to bear on the received logical system. That system falls to pieces as soon as the other interpretation is let in. Inference, for instance, from subalternant to subalternate, with all its syllogistic applications, requires the former as a foundation. Again, it has not yet been made unquestionable, that the "some not all" is positively required, even for the new system which has been proposed as supplementary to the old. At all events, the dealing with it must be left to those by whom the thorough development of the new system may be undertaken.

CHAPTER III.

CATEGORICAL INFERENCE, MEDIATE OR SYLLOGISTIC.

DIVISION I.—THE FORMAL DOCTRINE OF THE SYLLOGISM.

ARTICLE I.—*The Form of the Syllogism.*

76. A simple Categorical Syllogism has three terms: the Major, the Minor, and the Middle.¹ Each of these occurs twice in the process. The minor and major terms are, respectively, the subject and the predicate of the consequent, and are often spoken of as the Extremes. The middle term is that which appears only in the antecedent. All the three names are significant. The middle term is introduced merely as a standard by which each of the other two may be measured: and, when an affirmative syllogism is reduced to its normal shape, this term is found to stand between the others, including the one, and being included in the other.² In a syllogism so reduced, the minor term is seen to be that term which is included in the middle, the major term to be that which includes it.

The syllogism, when fully set forth, has three propositions. Two of these, which together constitute the antecedent of the inference, are called the Premises: and this name is applicable, not merely because they are made to stand before the consequent when the argument is set down for logical analysis, but also because they are the data and presuppositions of the process. The third proposition is the consequent.

¹ This division of the chapter on the syllogism is designed to be an exposition of the received syllogistic scheme, embracing both the formal principles and all the special rules that have practical uses, and deviating as little as possible from the method followed in the standard books. Archbishop Whately's exposition, here as elsewhere, is admirable; and the details of processes are worked out with great exactness by Huyshe, *Treatise on Logic*, 1842. The doctrine is very instructively summed up from a higher point of view by Solly.

² The name "Argument," used commonly and conveniently to signify the process of inference as a whole, was currently applied by old logicians to the middle term. This meaning of the word has uses dialectical or rhetorical. The discovery of arguments, in proof of proposed conclusions, is resolvable into the discovery of middle terms.

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The premise, whose two terms are the major and the middle, is called the Major Premise: the premise, whose two terms are the minor and the middle, is called the Minor Premise: the one proposition which is the consequent, and whose terms are the minor and the major, is called the Conclusion.¹

The order of the propositions is a matter indifferent to the character of the argument. If we propose the consequent, in the shape of a problem or question, to be solved or answered through the antecedent, the conclusion, when ascertained, may stand first; and the premises will then follow as a reason, introduced by causal particles, as "because." But, in logical treatment of arguments, we assume the premises as given, and place them first; and we add the conclusion, introducing it by illative particles, as "therefore."

The order of the premises, again, has been fixed differently in different logical schools. The real course of the argument is best seen when the minor premise is put before the major. Some points of incidental illustration will, even now, become clearest when this order is adopted: and, in the last stage of our dealing with the categorical syllogism, it will force itself on us continually. But, the purpose, in the meantime, being to lay down and explain the received rules, the other order must be adopted. All those scholastic rules and schemes, which depend on arrangement of the propositions, suppose them to stand in this order: Major Premise; Minor Premise; Conclusion.²

The figure and mood of the syllogism.

77. In the Conclusion, as we have seen, the function of each of the terms is fixed. The minor is the subject, the major the predicate. The fact which fixes it is, the rejection of all propositional forms except A, I, E, and O. If the other possible forms were admitted, the function of the terms in the conclusion would be indifferent.

The function of the terms is not fixed in the Premises. The Middle Term, occurring once in each of these, may have its function varied in any of four several ways; and each of these variations may, in certain circumstances, be adopted without invalidating the argument. Accordingly, there are four admissible variations of the function of the middle term; and these yield the Four Syllogistic Figures. The Figure of a syllogism is its structure with reference to the function of the middle term. Figure, accordingly, is determined exclusively by the premises.

In the First Figure, the middle term is the subject of the major premise, and the predicate of the minor; in the Second Figure, it is the predicate of both premises; in the Third Figure, it is the subject of both premises; in the Fourth Figure, it is the predicate of the major premise, and the subject of the minor.³

¹ Other designative names have been given to the premises severally, but with varieties of application. The major has been called the Proposition, and, by some of the Germans, the Rule (a name bearing on the first figure). The minor has been called the Assumption, a name fitter perhaps for the major. It has more aptly been called the Subsumption (= position of minor under middle); and this name, like so many others of the science, has found its way into the nomenclature of business: the word lingers, though with almost total loss of meaning, in the forms of Scottish law-writs. Hamilton calls the major premise the Sumption, the minor the Subsumption.

² Hamilton has summed up much information as to the order in which the premises have been arranged at different periods in the history of the science. (*Discussions*, p. 645; and note in Thomson's *Laws of Thought*, 1854; p. 224.)

³ The fourth figure emerges, necessarily, when we look at the syllogism in this unanalytic way, asking only whether the middle term is subject or predicate. But the figure falls away, as being a variation of the first, if, dissecting the premises, we inquire which term is contained in which. So examined, the syllogism gives three figures only: the first (covering the fourth), in which the middle term is between the extremes; the second, in which it stands above both; the third, in which it stands under both. Aristotle, adopting this deeper analysis, and fixing no order of premises, recognised

The subject being always understood to stand before the predicate, the following table exhibits the position of the terms in each of the four figures. Here, and afterwards, M denotes the middle term, S the minor, P the major.

	Figure I.	Figure II.	Figure III.	Figure IV.
Major Premise.....	M P	P M	M P	P M
Minor Premise.....	S M	S M	M S	M S
Conclusion.....	S P	S P	S P	S P

The structure of a syllogism, in reference to the quantity and quality of its propositions, is called its *Mood*. Those forms of predication only being taken into account which are denoted by A, E, I, and O, the moods arithmetically possible are sixty-four. For any one of the four forms might supposably be either major premise, minor premise, or conclusion; and each, appearing in any one proposition, might be accompanied in each of the other two propositions by any form of the four. But, as we shall immediately learn, a very large majority of the sixty-four moods would produce arguments totally invalid.

ARTICLE II.—The Principle of the First Syllogistic Figure.

78. By a large majority of logicians, the First Figure has been recognized as the normal form of the syllogism. In support of this opinion there is alleged the fact, that in this figure, and in it only, the middle term, the sign of the syllogistic thought through which the other two terms are united in one judgment in the conclusion, occupies its just place in relation to the other two: it includes the minor term, and is itself included either in the major term or in its contradictory. The character of the first syllogistic figure.

The terms are so related in the following syllogism of the first figure, in which, to exhibit the relation more clearly, the minor premise is placed before the major:—"All the S's are M's; all the M's are P's: therefore, all the S's are P's." "The minor is included in the middle; the middle is included in the major: therefore, the minor is included in the major."

So is it, too, though the syllogism have a negative conclusion; as thus: "All the S's are M's; the M's are not P's: therefore, the S's are not P's." For the argument may be analysed in this way:—"The minor is included in the middle; the middle is included in the contradictory of the major: therefore, the minor is included in the contradictory of the major."

Let us examine, generally, the character of an argument thus framed. In the first place, it bears on the face of it a reference, more direct than that made by any other form, to the principle of non-contradiction. It is an unmistakable passage from one identity or non-identity to another. It is a formula exemplifying a law: "things which are identical with the same thing are identical with each other." In our affirmative example, it was asserted that S is identical with a part of M, and the whole of M (including, of course, that part) with a part of P. Hence it was inferred, that S is identical with a part of P, or that the things called S are the same things which, with other things, are called P. To the negative example the same reasoning is applicable, with the substitution of Not-P for P.

In the next place, such an argument exhibits, in their natural order of sequence, the steps of a process of deduction. It is asserted that a given case is included in a class of cases, which are known to be governed by a law or principle assumed as already established. It is inferred that the given case is governed by that law or principle. "The

three figures only; and on this view we must in the end fall back. The source whence the schoolmen borrowed the fourth figure is doubtful. This figure has, by long tradition, been ascribed to Galen; but, after careful inspection of the fragmentary logical notices scattered through his medical writings, both Hamilton and Trendelenburg have failed to discover it.

Doctrine of given case S is included in the class of cases M; the whole inference. class of cases M is governed by the law P (or No P): therefore, the case S is governed by the law P (or Not-P)."

The dictum in its reference to the whole of extension.

79. Accordingly, there has been assigned, as the supreme and only original Law of the Syllogism, the maxim which, from one of its expressions, is called the *Dictum* (or *dicta*) *de omni et de nullo*. In all its shapes, it considers two of the terms as constituting an ordained series. But it is usually framed so as to interpret the ordination from the side of extension; seldomer so as to interpret it from the side of comprehension. It must be examined in both aspects.

(1.) The *dictum*, as it appears when the terms are read in extension, is most frequently enounced in such a shape as this: "Whatever is predicated (affirmatively or negatively) of a class, may be predicated in like manner (that is, affirmatively or negatively) of everything included in the class." A closer approximation to the scheme of the predicables is gained by this expression: "Whatever is predicated of a genus, is predicable also of a species included in the genus."¹

In the major premise: Of a class or genus M—there is affirmed or denied—some thing denoted by P.

In the minor premise: The species S—is affirmed to be —included in the genus M.

∴ In the conclusion: Of the species S—there is affirmed or denied—that which is denoted by P.

The terms directly ordained are the middle and the minor; the former is the genus, the latter an included species. The major term denotes an attribute, which is asserted to be possessed or not possessed by the genus, and which, therefore, through a double subalternation, is inferred to be possessed or not possessed by the species. "All the M's have the attribute P (and, consequently, some M's have it); but the S's are some M's: therefore the S's have the attribute P."

Again, in the dictum, as thus read, the major term is not expressly embraced in the ordination. It does not directly require to be so. In both of its appearances it is a predicate, interpretable as the name of an attribute; and therefore it does not necessarily receive a place in a series constituted by terms which are regarded as the names of classes, containing objects or substances. But its place, as the most extensive term in the ordination, is unavoidably implied: it is impossible to read, analytically, any syllogism exemplifying the dictum, without bringing this relation to light. The three propositions of a syllogism purely affirmative, are assertions of three successive and widening steps of inclusion: the propositions of a syllogism which introduces negatives are readily and correctly interpretable in the same way, if only we substitute for the major term its contradictory.

The completed ordination of the terms in extension, from narrowest to widest, is this: "S, M, P (or Not-P)." This gradation is explicated, step by step, when the syllogistic propositions are arranged thus: minor premise, major premise, conclusion. "All (or some) S's are in M; all M's are in P (or in Not-P): therefore all (or some) S's are in P (or in Not-P)."²

¹ Quidquid de omni valet, valet etiam de quibusdam et singulis (the "dictum de omni"); quidquid de nullo valet, valet nec de quibusdam nec de singulis (the "dictum de nullo").—Quidquid valet de genere, valet etiam de specie: quidquid repugnat generi, repugnat etiam speciei.

² This resolution of negative syllogisms into affirmatives is, evidently, through contraposition of the major premise and the conclusion. It is possible in the first figure, because in it the major term is always a predicate. Since, therefore, it is always competent thus to substitute, for a proposition of exclusion, its equipollent proposition of inclusion, the *dictum de nullo* might be dispensed with. But, though the contraposition is often convenient, and though, especially, it gives the clearest view over the ordination of the terms; yet it is not a safe operation where the validity of a chain of syllogisms is under scrutiny. If we were to contrapose a

Otherwise, indeed, syllogisms in which negatives are introduced might, easily, be traced back to a pre-ordination without displacement of the negations. The middle term and the major would, in this view, be taken as co-ordinates, which, by the law of the concept, must be denied of each other. The minor would then denote a species: the middle and major would denote two genera proximate to it, and mutually co-ordinate and exclusive. The ascending ordination would be: "S, M + P."¹

80. (2.) When the terms are read in comprehension, the dictum takes several forms, of which this is the most common: "The mark of a mark is a mark of a thing."² That is, an attribute of a second attribute is an attribute of any object or substance possessing the second attribute. The first attribute is the major term; the second attribute is the middle term; that which is regarded as a substance is the minor term. The negative expression of the maxim is needless, and tends to perplex: it is sufficient, as before, to substitute, when negation is introduced, the contradictory of the major term for that term itself. "If P (or Not-P) is a mark or attribute of M, and if M is a mark or attribute of the object or objects S, then P (or Not-P) is a mark or attribute of S."

The meaning of the rule in this shape is plain; and its truth, as a simple application of the law of identity, is self-evident. The use of it in testing syllogistic examples is troublesome; because it throws us on those abstract phrases, which, though distinctively-significative of the relation of comprehension, are unusual and unmanageable.

We are guided towards concrete phrases, by an expression of the dictum supplied to the schoolmen by Aristotle himself,—an expression which, while it is more readily applicable to comprehension than to extension, does not expressly allege either. It is the widest, and perhaps the most apt, of all the shapes in which the dictum can be couched. "That which is predicated of the predicate, may be predicated of the subject." That which (in the major premise) is predicated of the predicate (of the minor premise), may (in the conclusion) be predicated of the subject (of the minor premise).³

In the major premise: Of M—there is affirmed—the mark or attribute P (or Not-P).

In the minor premise: Of S—there is affirmed—the mark or attribute M.

∴ In the conclusion: Of S—there is affirmed—the mark or attribute P (or Not-P).

In the comprehensive form of the dictum, the terms directly ordained are the middle and the major. The major is in the comprehension of the middle, being a mark of it: the major is the less comprehensive, the middle the more comprehensive, of the two. The minor term denotes a substance or substances, an object or group of objects, which is asserted to possess the attribute denoted by the middle;

negative conclusion, we might, when it next emerges as a premise, require to re-contrapose.

¹ For a characteristically acute statement of difficulties, which the last two or three paragraphs, as well as similar resolutions elsewhere, are designed to meet, see Trendelenburg, *Logische Untersuchungen*, ii., 238, &c. His objections are two: first, that when the dictum is considered in extension, the major term falls out of the scale of subordination; secondly, that when one of the premises is negative, the subordination breaks down altogether.

² Nota notæ est etiam nota rei: (repugnans notæ repugnat rei).

³ Prædicatum prædicati est etiam prædicatum subjecti. "Ὅσα κατὰ τοῦ κατηγορουμένου λέγεται, πάντα καὶ κατὰ τοῦ ὑποκειμένου ῥηθήσονται. (Categ., cap. 5). In toto esse vel de omni prædicari dicitur, quoties non potest inveniri aliquid subjecti, ad quod illud quod prædicatur dici non possit. In toto vero non esse vel de nullo prædicari dicitur, quoties nihil subjecti poterit inveniri, ad quod illud quod prædicatur dici possit." (Boethius, *De Syllogismo Categorico*, Opera, p. 691).

Doctrine of inference.

and it is therefore inferred to possess the attribute denoted by the major, which is a part of the attribute denoted by the middle. "The attribute M comprehends the attribute P (or Not-P); the S's (all or some) possess the comprehending attribute M: therefore the S's (all or some) possess the comprehended attribute P (or Not-P)."

When the dictum was analysed extensively, the major term, being used only as an attributive name, did not require to be expressly referred to an ordination constituted by terms which were considered as names of substances. Now, when the dictum is analysed comprehensively, the minor term, which in both of its appearances is only a name denoting substance, does not require to be expressly referred to an ordination containing terms which are considered as names of attributes. But it may be so referred: and the presupposed series is not complete until the minor term is placed as one extreme of it.¹ The minor term, which was found to be the least extensive of the series, is necessarily the most comprehensive. The completed ordination of the terms in comprehension, from narrowest to widest, is this: "P (or Not-P), M, S." This gradation is, of course, explicated, when the propositions are arranged in the order opposite to that which exhibited the widening scale of extension: conclusion, major premise, minor premise. The retention of the negative predications might here, as in the other view, be justified through the assumption of co-ordination, and consequent exclusion, between the middle term and the major.

The special laws of the first figure inferred from the dictum.

81. The *dictum de omni et nullo*, in all its forms, is plainly nothing more than a corollary, or pair of corollaries, from the principle of predication through common terms. It is required only to accept two, at most, of the special laws deduced from that principle; and to explain their applicability to cases in which the antecedent is not one proposition but two. *The Law of Affirmation through Subalternation*, expressed so as to cover more degrees than two, guides us through all syllogisms purely affirmative: while, as it has been shown, the negations of a syllogism may be displaced, and this one law be applied to all. If given negations are retained, we have only to accept, along with the law of affirmation through subalternation, *the Law of Negation through Co-ordination*.

The first figure is subject to three Special Laws. These, though they are proveable, and will be proved, otherwise, are deducible, readily and instructively, from the dictum. The extensive form of the dictum is most conveniently available for the purpose.

(1.) The Minor premise must be Affirmative. In that premise, the minor term is subject, the middle is predicate. The rule therefore says, simply, that the minor term must be included in the middle, not excluded from it; that it must be describable (if it be a common term), as one of those species which the middle term, a genus, is supposed to contain. If it were not so included, so describable, nothing would be asserted to be "contained in the class," no species to be contained in the genus. Whether the major term were affirmable or deniable of the middle, there would be no data for determining whether it were affirmable or deniable of the minor. In a word, there would be wanting the lowest step of the ordination in extension, the step out of which all the others come.

The middle term signifies a class; the major signifies an attribute belonging to the class, or wanting in it. The minor signifies something which is placed in that class; and, being so placed, it must possess the class-attribute, or want an attribute not found in the class. The middle term is in-

roduced to be a link in thought between the minor and the major: it is clasped to both. But, if the minor is not in the middle, the hold on that side has snapped.

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(2.) The Major premise must be Universal. In that premise, the middle term is subject, the major is predicate. Consequently, the rule alleges, that the whole class designated by the middle term must possess the attribute denoted by the major; or, in other words, that in this premise the middle term must be distributed. The reason stares us in the face. For the minor premise asserts, not that the minor term constitutes a class M, but only that it is in that class, or makes some part or other of it. If, then, it were only alleged, in the major premise, that some part or other of the class M possesses the attribute P (or Not-P), this might or might not be the same part which has been affirmed of S. The identity of S with a part of M possessing P, or its contradictory, cannot be made peremptory at any cheaper rate, than the assertion that the whole of M possesses P, or its contradictory.

But, it is to be observed, this necessity, for distribution of the middle term in the major premise, arises out of two features in the minor premise. *First*, That premise has an undistributed predicate (M): it affirms only that S is some part of the class M. *Secondly*, It affirms only that S is some undetermined part of M. Suppose that the part of M were there definitely identified; and that a part of M similarly identified were to become subject of the major premise. It might then be determinable, and signifiable through the form of expression, whether the part first named and that named second were one and the same, or two several parts. In the former case, the chain of identity would be unbroken: in the latter, it would be broken, and further progress from contained term to term containing would be impossible.

(3.) The Quality of the major premise determines the quality of the conclusion; the Quantity of the minor premise limits the quantity of the conclusion. This law, in both of its parts, is almost self-evident to every one who understands the character of the syllogism.

In the major premise it is asserted, either that the middle term has, or that it has not, the attribute denoted by the major term. If it has the attribute, the minor term also must have it, being a part of the middle: if the middle wants it, so must the minor. The minor premise, again, affirms, that either the whole class denotable by the minor term, or a part only of that class, is in the middle. If it has affirmed of the whole class, the predication in the conclusion may be made of the whole class (though, of course, we might hence subalternate to a part): if it has affirmed of a part only, it is of a part only that we can predicate in the conclusion.

ARTICLE III.—*Laws, Universal and Special, of the Syllogistic Figures.*

82. The *dictum* may be brought to bear on any syllogism whatever. For every syllogism of the second, third, or fourth figure, admits of being transformed into a syllogism of the first. But it is desired by those who hold the pre-eminence of the first figure, and insisted on by some of those who deny it, that we be enabled to test every syllogism as given, without questioning as to its figure, or making any change on its structure.

Such a test is supplied by two rules, the first justifying conclusions which are affirmative, the second those that are negative. They have been called the *Canons of the Syllogism*.

They are these: "Two terms which agree with the same third term, agree with each other. Two terms, whereof the one agrees and the other disagrees with the same third term, disagree with each other."

¹ Consult, again, for the questions raised here and in the last section, Trendelenburg, ii., 239. He there animadverts on the "*Nota nota*," (the form of the dictum adopted by Kant), which he rightly recognises as a reading of the dictum in comprehension.

¹ These expressions of the canons are, in substance, Aldrich's and

Doctrine of inference. Two terms are said by many logicians to "agree," or to be "congruent" or "consistent," when they may be the terms of an affirmative proposition. Two terms are said to "disagree," or to be "incongruous" or "inconsistent," when they can only be the terms of a negative proposition. This phraseology being adopted in the canons, agreement of terms in a given proposition is affirmation, disagreement is negation. The two terms first mentioned are the Minor and Major, the third term is the Middle.

The canons, accordingly, are interpretable by direct reference to the character of the copula in each of the three propositions of the syllogism. They might thus take the following shapes:—

First, "If there are given, as premises, two propositions, in which there is asserted, between M as one term, and S and P successively as the other term, a relation expressed by affirmation, there is implied, between S and P, a relation which must be expressed by affirmation in the conclusion."

Secondly, "If there are given, as premises, two propositions, in which, between M as one term, and S and P successively as the other term, there are asserted relations, which are expressed in either of the premises by affirmation and in the other by negation, there is implied, between S and P, a relation which must be expressed by negation in the conclusion."

So interpreted, the canons are evidently direct applications of the laws of identity and difference; for affirmation is the expression of identity, negation of difference.

The identities and differences are explicable in this way. 1. Two things, or groups of things, which are identical with a third thing, or group of things, must be identical with each other. If it be assumed that both S and P are identical with M, S and P must be identical with each other; or the names S and P are but two names for the same thing, or group of things. 2. If, of two things, or groups of things, the one is identical, the other non-identical, with a third thing, or group of things, the two must be non-identical with each other. If it be assumed either that S is identical, and P non-identical, with M; or that S is non-identical, and P identical, with M: S and P must be non-identical with each other; or the names S and P are names for two different things, or groups of things.

If we accept, and steadily keep hold of, the quantitative signs, "all, any, some," as integral parts of the terms, the applicability of the canons, as expressions of the two primary laws of predication, is thorough-going. It is plain, too, that the canons, in all their expressions, leave the function of each of the terms, as subject or predicate, completely open for all the three propositions. The only limitation is, the prohibition of all forms except A, E, I, and O.

The weakness of the canons lies, first, and positively, in their leaving the quantitative signs unaccounted for. The reasons which make these possible and necessary, do not emerge till we fall back on the dictum, and on those laws

Whately's. They are thus given by Burgersdyk, as bearing on syllogisms having a singular as middle term,—the "expository syllogisms" of the schools: "*Quæcunque uni tertio singulari conveniunt, ea quoque inter se conveniunt. Quorum unum alicui tertio singulari convenit, alterum non convenit, ea quoque inter se non conveniunt.*" Smiglecius carries them up directly to Identity and Difference: "*Quæ sunt eadem uni tertio, sunt eadem inter se. Quando est idem alicui, cui aliud non est idem, ipsa quoque non erunt idem inter se.*" (*Disputatio xiii., Quæstio 14.*) Keckermann unites the two, calling the complex law "The Principle of Proportion," that is, the principle in virtue of which the middle term becomes a measure of the other two: "*Quæcunque in uni tertio conveniunt, inter se conveniunt: quæ vero in uni tertio dissentiunt, inter se dissentiunt.*" (*Systematis Logici*, lib. iii., cap. 5.) This form requires a gloss: the agreement or difference "in" the middle term, is agreement or difference in the quality of the premises;—the reference of the syllogism to the canons, as universally superseding the dictum, was a step not taken till the latest times of scholasticism; and it has very frequently been protested against.

of common terms out of which it has grown. But it may even be questioned, whether the canons do not necessarily, —whenever the use of them requires interpretation of the quantitative signs,—presuppose the dictum, or the law of logical totality, from which the dictum itself springs.¹

83. The canons, then, enable us to consider every syllogism, whatever be its figure, as constituted by three assertions of identity or difference between the three terms, taken two and two. But, in order to determine positively what the objects are, which are asserted to be identical or different, we have to hold the quantitative sign of each term as being a part of it; and, in order to test decisively the question of identity or difference, we have to assume that "all" includes "some," or that a whole includes its part.

On this footing there are deducible from the canons six maxims, which are describable as Universal Rules of the Syllogism. Violations of these are, for mediate inference, the only Fallacies, or faults making an argument inconclusive, which logic can detect without extraneous aid.

(1.) A Syllogism has Three Terms. It is invalid if it has either fewer or more. A proof of this rule would be merely a repeated description of the nature of the syllogism; and, if the rule is accepted with presupposition of its reasons, the rules of quantity may be regarded as corollaries from it. The violation of any of them is resolvable into the introduction of a fourth term.

Fewer terms than three no syllogism is in any danger of having. But, seeming to have three only, it may really have more than three, through the ambiguity of words. This rule, indeed, is designed chiefly as a preliminary caution, against the fallacies which may insinuate themselves into reasoning by means of the fact, that there is no term, how-

¹ These two paragraphs may call for some illustration.

(1.) Given this syllogism in AII: "All M's are P's; some S's are M's: therefore some S's are P's." The data here are not the classes S, M, and P: the identity or non-identity of these classes as wholes is not put in question. The quantity of predicates being brought out, it appears that our terms are these: "some S's;" "all M's," ("some M's," however, being implied, and requiring to be explicated); "some P's." The assertions of identity are these: (1.) The objects called "all M's," are the same objects which are also called "some P's;" (2.) The objects called "some S's," are the same objects which are also called "some M's:" therefore (3.), the objects called "some S's," are the same objects which are also called "some P's."

(2.) Even when the quantitative signs are thus incorporated, there is still required, as the example shows, one interpretation of them. We cannot gain our inference, without assuming that "all" implies "some." If this assumption is refused us, we cannot show that the premises assert the identity of S and P with the same third term. But how do we come by the assumption? Can we do so without the idea of classification? Or can classification supply it, unless through the dictum or its principle?

If this doubt is well-founded, the canons are even weaker than the text has positively alleged them to be. They are sufficient, without the dictum, to justify syllogisms having a singular middle term. They cannot justify syllogisms whose middle is a common term, unless through a presupposition, of which the dictum, or the higher law of conceptive totality, is an element.

However, the assertion may be held to rest on the still wider truth, that a whole contains its part.

(3.) In spite of theoretical difficulties, the convenience of the canons is great. And, if the quantitative signs are taken as integral parts of the terms, and if, also, interpretation of these is admitted to the extent of the implication of "some" in "all," they do, as alleged in the text, carry us through syllogisms of any form. When, again, the conclusion is an E or an I, it is a matter of indifference to the application of the canons, which of the terms S and P is subject of the conclusion, and which predicate: the terms of E and I are reciprocal; and simple conversion yields a new E or I. But conclusions in A and O tie us down to S as subject, and P as predicate. A is convertible only into I², a form not received: O is not directly convertible at all. The fact that conversion would change the character of the predication in reference to the wholes of the concept, is not forced on our consideration when we test a syllogism by the canons.

Doctrine of inference. be capable of bearing more than one signification. If any name furnishes a term susceptible of two meanings, and if it bears one of these on its first appearance in a syllogism, and the other in its second, it has really furnished not one term, but two; a term denoting one set of objects, another term denoting a different set. The syllogism, therefore, has four terms, not three; and, at some point or other, the chain of comparison is broken. The middle term is, unquestionably, in greater danger of having two meanings, than either of the other terms is: and the intrusion of a fourth term in disguise is often described as the Fallacy of Ambiguous Middle. But the other terms likewise require to be watched.

(2.) The Middle term must be Distributed in one of the premises. The violation of this rule is the Fallacy of Undistributed Middle.

The rule is a consequence, following from the indefinite character of the part signified by the logical "some." M is introduced into the premises, in order that S and P may severally be compared with it. If it is twice undistributed, it may, for all we know, be double; and, if it is double, the syllogism has four terms. If S were compared with "some part or other" of M, and, again, P with "some part or other" of M, it would be left absolutely uncertain whether they have been compared with the same part, or with two parts that are different. No ground would have been laid down for determining their mutual difference or identity. But, if one of them is compared with the whole of M, and pronounced to be either the same or not the same with that whole, it is enough that the other should be compared with a part of the whole of M: since the first term, having been compared with the whole, must have been compared with this part. Accordingly, one distribution of the middle term is sufficient.¹

(3.) Neither the Minor term nor the Major must be Distributed in the Conclusion, if it was Undistributed in its Premise. Violation of this rule is an Illicit Process, and is, therefore, of two kinds: Illicit Process of the Minor, Illicit Process of the Major.

When we remember that the quantitative sign is a part of every term given in the process, we shall perceive at once that a breach of the rule would amount to the introduction of a fourth term. There is given in the premise a relation between M and "some S's" or "some P's." This gives us no right to infer, in the conclusion, anything in regard to "all S's," or "all P's."²

(4.) If both Premises are Affirmative, the Conclusion must be Affirmative.

This is evident, both from the words of the canons, and from their principle. The case is that which the first canon covers. Assertion of the identity of M both with S and with P, cannot, without self-contradiction, yield assertion of the non-identity of S and P with each other.

¹ In the first and second figures, the middle never is twice distributed. When it is so in other figures, the conclusion obtainable is exactly the same as it would have been if the middle had been distributed only once. The moods, in which the double distribution occurs, have premises needlessly wide for the conclusions.

² The two kinds of Illicit Process are not fallacies lying equally deep. In committing an illicit process of the minor, we have only inferred a universal, A or E, in a case where, if there be no other fallacy, we might have inferred a particular, I or O. The error is easily corrigible. But an illicit process of the major is, when it is the one fault, a fault that is incurable. It is forced on us by our having premises from which no inference at all could be drawn. It is possible only when the conclusion is negative, E or O; these conclusions only having a distributed major. In the premise, then, the major term, being by hypothesis undistributed, must have been either the subject of a particular, I or O, or the predicate of an affirmative, A or I. It will immediately appear, from the special rules of the figures, that, in such circumstances, inference is always impossible.

(5.) If either of the Premises is Negative, the Conclusion must be Negative. Doctrine of inference.

The case is covered by the second canon. If S (or P) is M, and if P (or S) is not M, S and P must be, not one thing, but two different things.

(6.) From Premises, both of which are Negative, no Conclusion can be inferred.

The case, not being covered by either of the canons, is thus virtually excluded; and it is self-evident that the exclusion is right. The assertion that both S and P are non-identical with M, leaves it utterly undetermined whether they are or are not identical with each other.

A violation of the first rule is a fallacy which throws the reasoning out of the very form of a syllogism. Violations of the second and third rules are fallacies of Quantity. Violations of the fourth, fifth, and sixth rules are fallacies of Quality. When the error does not flow from the most abundant of all sources, the ambiguity of terms, the fallacies most likely to occur are those of quantity; namely, undistributed middle and illicit process.¹

There are annexed a few examples, in which the Six Rules are palpably violated.²

¹ There have been laid down several other rules, all of which are truly derivative, either from the six above given, or from other obvious laws.

For example: When a universal Conclusion may be inferred there may be inferred also a Particular. This is nothing more than an assertion of the possibility of immediate inference, from the truth of the subalternant to the truth of the subalternate. But the point is worth observing; since it has a bearing on the scheme of the syllogistic moods.

Two of the scholastic rules deserve the subordinate place assigned to them by Whately. The violation of either of them warns us, that there must have been committed one or another of the fallacies of quantity. They may be numbered as supplementary to the six of the text.

(7.) When one of the premises is Particular, the conclusion must be Particular. The transgression of this rule is a symptom of illicit process of the minor.

This, and the fifth rule of the text, are combined by many of the old logicians into the one rule: That the conclusion, both in quality and in quantity, follows the Worse, or weaker, premise; "Conclusio sequitur partem deteriore." Negation is "worse" than affirmation, particularity than universality.

(8.) From premises, both of which are Particular, no Conclusion follows. The transgression of this rule is a symptom, either of undistributed middle, or of illicit process of the major, the two fallacies which arise out of bad premises.

Premises in OO, as being both negative, are condemned otherwise. Premises in II plainly give undistributed middle. Premises in IO (the major premise first), require O in the conclusion, and give illicit process of the major; while in Figure III. there will also be undistributed middle. Premises in OI give undistributed middle, when that term is subject of the major premise (that is, in Figures I. and III.): they give illicit process of the major, when that term is subject of the major premise (that is, in Figures II. and IV.).

* Breaches of the Six Syllogistic Rules.

Rule 1. Nettles are stinging plants; and fig-trees are nettles: therefore it must be true that fig-trees sting. "All M's—are—some P's; all S's—are—some M's: ∴ all S's—are—some P's" (Ambiguous middle, making four terms).—The fig belongs to a tribe of plants, the typical name of which (Lindley's "Urticales") is taken from the common nettle.

Rule 2. Since many plants are beautiful, and many plants are rare; may we not infer, that among the things that are rare, there are some that are beautiful? "Some M's—are—some P's; some M's—are—some S's: ∴ some S's—are—some P's" (Undistributed middle).

Rule 3. (1.) Interest attaches to all plants, and rarity may be asserted of many plants; is it therefore true that every thing rare is also interesting? "All M's—are—some P's; some M's—are—some S's: ∴ all S's—are—some P's." (Illicit process of minor).

(2.) We infer that there is no beauty in flower-beds; because grassy surfaces are beautiful, and flower-beds are not grassy surfaces. "All M's—are—some P's; any S's—are not—any M's: ∴ any S's—are not—any P's." (Illicit process of major).

Rule 4. Assuming that every exotic plant is interesting, but that not a few such plants are useless; should we be in any danger of

Doctrine of inference. Determination of the eleven valid moods.

84. When the sixty-four possible Moods of the syllogism are tested by the six rules, it is discovered that fifty-three of them do necessarily, whatever the figure may be, yield bad conclusions. None of them can violate the first rule: but all of them violate either rules of quality, or rules of quantity, or rules of both kinds. Accordingly, no more than *eleven* of the sixty-four can ever be valid.¹

First, There are thirty-two moods which appear, on the face of them, to involve fallacies of quality. Our fourth rule is transgressed by AAE, AAO, AIO, IAO; our fifth by AEA, AEI, AOA, AOI, EAA, EAI, EIA, EII, IEA, IEL, OAA, OAI; our sixth by EEA, EEE, EEI, EEO, EOA, EOE, EOI, EOO, OEA, OEE, OEI, OEO, OOA, OOE, OOI, OOO.

Secondly, There are twenty-one moods which, when the distribution of the terms is examined, are found to involve fallacies of quantity.

inferring that few things which are useless are also interesting? "All M's—are—some P's; sothe M's—are—some S's: ∴ some S's—are not—any P's." (Both premises affirmative; conclusion negative).

Rule 5. If all imperfect plants want true flowers, and if true flowers grow on all trees; we are surely not tempted to infer that trees are imperfect plants. "Any P's—are not—any M's; all S's—are—some M's: ∴ all S's—are—Some P's." (One premise negative; conclusion affirmative).

Rule 6. If we wish to determine whether the potatoe-plant is or is not a nightshade (*Solanum*), we shall hardly suppose ourselves to have sufficient data, though we know that neither any potato, nor any nightshade, produces fruit which can safely be eaten. "Any P's—are not—any M's; any S's—are not—any M's." (Both premises negative; no conclusion possible).

In a preceding article of the Encyclopædia [FALLACY], the principal sources of inconclusiveness in argumentation were described in outline. The topic is hardly anywhere treated so thoroughly, and nowhere so practically, as in Whately's dissertation, "Of Fallacies."

Fallacy may have place, either in the *form* of an argument, or in its *matter*. If it is formal, the conclusion does not follow from the premises; and the logical rules expose the flaw. If it is material, the conclusion does follow from the premises; and logical rules have no bearing; but, here, the fault may be, either in the premises, or in the conclusion. Accordingly, all the kinds of fallacy may be distributed in the following way. Either they are *Fallacies of Inference*, which are formal, but may be either *patent* or *latent*; or they are *Fallacies of Assumption* or of *Exposition*, both of which are material. Not infrequently, an argument combines fallacies of more kinds than one.

(1.) A fallacy of inference is patent, when the logical rules detect it without interpretation of terms. It is latent, when interpretation of terms must precede logical analysis. The latency of formal fallacies arises always from the *ambiguity of words*; and the treatises on fallacies, which are so full in many logical works, are chiefly occupied in explaining the causes and kinds of ambiguity. (2.) A fallacy of assumption consists in arguing from one or more premises which are not true or not admitted. It is most frequently latent; the faulty premise being virtually, but not obviously, either identical with the conclusion or dependent on it. This latency is the case of "petitio principii" or "quæsti," the begging of the question; and the name "arguing in a circle" should mean a repetition of this error, by inferring back to something which was really a preceding premise. (3.) A fallacy of exposition is a mis-statement of the question which is at issue. Its scholastic name is "ignoratio elenchi," the ignoring or shunning of the conclusion which would contradict the position of the adversary: the argument has as its result an "irrelevant conclusion," a conclusion different from that which ought to have been proved. This fallacy is signified by the common expression of "shifting the ground." A union of it with ambiguity of terms is perhaps the most frequent of all flaws in reasoning. To it are referable instances in which any principle, rightly pleasurable in some cases, is applied to a case which it does not cover. This is exemplified by the "argumentum ad verecundiam," the appeal to authority; and by the "argumentum ad hominem," the attempt to show that an opponent's position is taxable with inconsistency: and in a similar predicament are illegitimate endeavours to influence judgment through emotion.

¹ Henceforth, in this division, the common order of the premises, as being that which is taken for granted in the received doctrine of mood and figure, must be steadily adhered to. The major premise precedes the minor.

(1.) The supplementary rule, numbered as our seventh, Doctrine of inference. gives notice that the third rule is violated by AIA, AIE, AOE, EIE, IAA, IAE, IEE, OAE.

(2.) The supplementary rule, numbered as our eighth, gives notice that either the second rule or the third must be violated by IIA, IIE, III, IIO, IOA, IOE, IOI, IOO, OIA, OIE, OII, OIO.

(3.) The mood IEO necessarily violates the third rule through illicit process of the major. The major term is distributed in the conclusion; while it cannot, whether as subject or as predicate, have been distributed in its premise.

Not a few of the moods thus excluded, violate evidently more rules than one.

The other moods, which only can ever yield a valid inference, are these eleven: four moods having affirmative conclusions, AAA, AAI, AII, IAI; seven moods having negative conclusions, AEE, AEO, AOO, EAE, EAO, EIO, OAO.¹

85. It must now be considered how the relation of Mood Determination is affected by the relation of Figure.

We see that there are no more than eleven combinations of propositions, which can, in any figure, stand the test of the syllogistic rules. Further, the functions imposed on the terms, as subject or predicate, in the premises of the Four Figures, vary far enough to make us expect, before minute inspection, that a mood may be valid in one figure yet invalid in others. And the fact is so.

The moods are not applicable to use, unless through the adoption of one or another of those modes of constructing premises which constitute the figures. Accordingly, we may henceforth understand, by a mood, a Mood in a given Figure. Of the eleven valid moods, each of the figures admits six: whence, of Moods in Figure, there are in all Twenty-Four. Five of these, however, noted in the following list by italic letters, are unused, as giving particular conclusions where the premises allow the conclusions to be universal. These particular conclusions, indeed, may always be held to have been reached through subaltern inference from the universals.

Figure I. has these moods; AAA, *AAI*, EAE, *EAO*, AII, EIO.
Figure II. EAE, *EAO*, AEE, *AEO*, EIO, AOO.
Figure III. AAI, IAI, AII, EAO, EIO, OAO.
Figure IV. AAI, AEE, *AEO*, IAI, EAO, EIO.*

¹ The moods might be scrutinized, also, in another and quicker way. The exclusion of the bad moods is gained, by far most readily, through this question: How many pairs of premises are there, which, as being neither both negative nor both particular, may yield some conclusion or other? There are nine such pairs; but one of them, IE, breaks down when closely handled. Therefore the valid pairs of premises are only eight: AA, AE, and EA, both universals; AI, IA, AO, EI, OA, of which the one is universal, the other particular. Each of the three pairs of universals admits two conclusions, a universal and a particular: each of the others is tied down to one particular conclusion. The conclusions being supplied, we have the same eleven moods which had been discovered through the more cumbrous process.

* This table allows a comparison of the figures, in reference both to the structure of their syllogisms, and to the forms of propositions which are attainable as conclusions through them. Of many considerations which suggest themselves, the following are the most important:—

I. Of the eleven moods, there are only two which distribute their terms widely enough to sustain, without lapsing into fallacies of quantity, all the changes of structure which the variation of figure causes in premises. These, as we should expect, are negative moods; they are EAO and EIO. But, though these moods are good in all the four figures, the former is useless in two of them. Still, the fact stands, that, in all figures, EA, and even EI, are good premises.

II. The figures differ widely, in respect of the range of their conclusions.

(1.) The pre-eminent power of the First Figure is shown in two features. It is the only figure in which we can prove a universal

Doctrine of
inference.
The special
rules of the
four fi-
gures.

86. These twenty-four valid Moods in Figure are easily ascertained, through application of the six universal rules of the syllogism to those modifications of the functions of the terms in premises, which severally constitute the four syllogistic figures. The limitations which the six rules impose on the character, both qualitative and quantitative, of the propositions admissible to constitute a syllogism in each of the figures, might be gathered from the table, just set down, of the moods in figure. But some uses are served by the generalizing of those limitations into Special Rules of the Figures, and by a brief deduction of these from the six universal rules.¹

Figure I.

The three special rules of the First Figure have already been proved through the dictum. They are proveable, also, through the canons and the deduced universal rules; not with so close a reference to principles, but much more briefly than in the other way.

(1.) The Minor premise must be Affirmative. Suppose it negative: the major premise must then, by the sixth rule, be affirmative; and the major term, being its predicate, will be undistributed. But, by the fifth rule, the conclusion must be negative, and will accordingly have its predicate, the major term, distributed. Therefore, a breach of this special rule would cause the incurable fallacy of an illicit process of the major.

(2.) The Major premise must be Universal. Let it be particular; in other words, let its subject, the middle term, be undistributed. By the special rule just proved, the minor premise must be affirmative, and will not distribute its predicate, the middle term. Therefore, a breach of this rule produces the incurable fallacy of undistributed middle.

(3.) The Quality of the major premise determines the quality of the conclusion; the Quantity of the minor premise limits the quantity of the conclusion. (1.) If the major premise were negative, and the conclusion affirmative, the fifth rule would be violated: if the minor premise were affirmative, and the conclusion negative, then (besides the qualitative fallacy caused by the two affirmative premises), the major, being predicate of both propositions, would suffer illicit process. (2.) The minor term, being subject both of the minor premise and of the conclusion, would suffer illicit process if it were undistributed in the former, and distributed in the latter. If the minor premise is universal, the conclusion may be so: and subalternation would thence yield a particular.

Figure II.

The special rules of the Second Figure are three.

affirmative; and it is the only figure in which we can prove conclusions having all the four forms, A, E, I, and O.

(2.) The Second Figure allows no conclusions but negatives.

(3.) The Third Figure allows no conclusions but particulars.

(4.) While the Fourth Figure allows all forms of conclusion except A, its weakness is shown by this fact, among others: that in it we can prove an I only, from the same premises which, by being merely transposed, would fall into the first figure, and give a conclusion in A.

III. The several pairs of premises are very unequally applicable to the proof of conclusions belonging to the four several kinds. The data sufficient for establishing propositions Particular, or Negative, are, in a humbling degree, more various than those that are required for establishing Universals, or Affirmatives. The five subalternated conclusions being thrown out of account, the reckoning for the other nineteen stands as follows:—

(1.) The moods proving universal conclusions are five; those proving particulars are fourteen.

(2.) The moods proving affirmatives are seven; those proving negatives are twelve.

(3.) A is proveable by one mood; E by four moods; I by six; and O by eight.

¹ Among the neatest demonstrations of the Special Rules of Figure from the six rules, are those of Huyshé. The third rule of the first figure is not given in the English books.

(1.) One of the Premises must be Negative. The middle term, being the predicate of both premises, would be twice undistributed if both were affirmative. The Doctrine of inference.

(2.) The Conclusion must be Negative. One of the premises being negative, the conclusion also must be so, by the fifth rule.

(3.) The Major premise must be Universal. It must be so on pain of illicit process of the major term. The conclusion, being negative, distributes that term: consequently, it must be distributed in its premise, of which it is the subject.

Figure III.

The special rules of the Third Figure are two.

(1.) The Minor premise must be Affirmative. If it were negative, the major premise must, by the sixth rule, be affirmative, and would not distribute its predicate, the major term. But, by the fifth rule, the conclusion must be negative, by reason of the negative premise: consequently, the major term would here be distributed; in other words, there would be committed an illicit process of the major.

(2.) The Conclusion must be Particular. By the rule just proved, the minor premise is affirmative; and the minor term, being its predicate, is undistributed: consequently, if that term were distributed in the conclusion, there would be an illicit process of the minor.

Figure IV.

The awkwardness of the Fourth Figure is never more striking, than when the attempt is made to lay down special rules for its construction. The three following are the most comprehensive of those that have been applied to it:—

(1.) If the Major premise is Affirmative, the Minor premise must be Universal. The middle term, being the predicate of the major premise, is undistributed when that premise is affirmative. If, then, the minor premise were particular, the middle, being subject, would be again undistributed. The rule must be obeyed, for the avoidance of undistributed middle.

(2.) If one premise is Negative, the Major premise must be Universal. If the major premise were particular, the major term, being its subject, would be undistributed. But, by the hypothesis and the fifth rule, the conclusion must be negative, and the major term must there be distributed. The penalty for breach of the rule is illicit process of the major.

(3.) If the Minor premise is Affirmative, the Conclusion must be Particular. The minor term, being predicate of its premise, is, by the hypothesis, undistributed: consequently, it cannot be distributed in the conclusion. The rule is fenced by illicit process of the minor. It is this limitation that makes premises in AA so much less valuable in this figure, than they are when transposed into the first, where the term which was subject of the conclusion becomes predicate, and is, therefore, left undistributed without harm.¹

87. Those logicians who maintain the pre-eminent validity of the first figure, describe syllogisms in it as Perfect and Direct; syllogisms in the other three figures as Imperfect and Indirect.² All syllogisms of the indirect figures The reduction of syllogisms.

¹ These are the rules of the Fourth Figure assigned in the Port-Royal Logic, and by several of the German logicians, as Höffbauer and Bachmann. Huyshé's rules are these three: 1. The Major premise must not be O, else there is an illicit process of the major; 2. The Minor premise must not be O, else there is an undistributed middle; 3. The Conclusion must not be A, else there is an illicit process of the minor.

² In some of the more complex of the old systems, the name of "Indirect" is given to certain moods, of which there are not here recognized any, except such as slip in under the disguise of the

Doctrine of admit of being transformed into syllogisms of the first inference. figure. The process of transformation is called Reduction.

The method which must chiefly be available is evidently the conversion of one or both of the premises. In reducing from the second figure, where the middle term has already its right place in the minor premise, the conversion of the major premise would seem to be sufficient. For the third figure we should require conversion of the minor premise; for the fourth figure, conversion of both.

But, conversion having been performed, we should sometimes have gained premises which, though good in the given figure, are not so in the first. Thus AE, valid data in the second figure, would, in the first, yield an illicit process of the major. EA, however, are good premises in the first figure: therefore the remedy is found in the transposition of the premises, which, also, in some cases, supersedes conversion of them.

Finally, if the premises are transposed, the major and minor terms have exchanged functions. Effect must be given to this exchange by the conversion of the conclusion.

There are required, accordingly, for reduction, all the three methods: conversion of one or both premises, as a step to be taken almost always; transposition of the premises, when they would otherwise be bad; conversion of the conclusion, when the premises have been transposed.

The conclusion of the given indirect syllogism, when it has not been converted in the reduction, is proved directly by the new syllogism in the first figure. If it has been converted, there is proved, in the new syllogism, a conclusion from which the given one may be inferred by re-conversion.

With these alternatives open, reduction is possible and easy for all the indirect moods except two; AOO in the second figure, OAO in the third. The difficulty with these lies in the impossibility of directly converting O. The obstacle may be cleared away through contraposition. But an indirect reduction of another kind is also available.

The Rules of Reduction for all the indirect moods, and the relations between them and the moods of the first figure, were abbreviated by the schoolmen into clumsy names, in which certain of the letters have conventional meanings. For further aid to the memory, the names were cast into five halting hexameters, in several readings, of which the following is one:—

- I. *bArbArA, cElArEnt, prima, dArII, fErIOque*;
- II. *cEsArE, cAmEstrEs, fEsInO, bArOcO, secunde*;
- III. *tertia dArAptI, dIsAmIs, dAtIsI, fElAptOn,*
fErIsO, bOcArO, habet: quarta insuper addit
- IV. *brAmAntIp, cAmEnEs, dImArIs, fEsApO, frEsIsOn.*

Of the twenty-four valid moods in figure, the scheme rejects the five which have subalternated conclusions; and these, when they have to be referred to, may be described as Nameless Moods. The Named Moods, denoted by the leading words in the verses, are thus nineteen.

The First Figure has four named moods. Its admissible number of six is completed by two nameless moods, AAI and EAO, whose conclusions are severally subalternated from those of *Barbara* and *Celarent*.

The Second Figure has four named moods. It has two nameless moods, EAO, and AEO, standing respectively under *Cesare* and *Camestres*.

The Third Figure has six named moods. Its conclusions, being all particulars, cannot have subalternates.

The Fourth Figure has five named moods. Its one nameless mood is AEO, under *Camenes*.

fourth figure. The received moods yield to them the premises without change, and the conclusion by conversion.

The names given to the moods in the "Barbara" lines signify the rules of reduction in this way:—The vowels mark, self-evidently, the quantity and quality of the propositions constituting each mood. Of the consonants, those only are significant which are printed in italics. (1.) The *b, c, d,* and *f,* the initial letters of the four names in figure first, are the only initials used for any of the other names. An indirect mood is thus signified to be reducible to that direct mood, whose name begins with the same letter. (2.) The other significant consonants are four: *s* directs Simple Conversion; *p* Conversion *per accidens*; *m* Transposition of Premises (*metathesis* or *mutatio*); *c* Reduction through Contradiction. The proposition to be operated on through *s, p,* or *c,* is that which is symbolized by the vowel immediately preceding the consonant: the place of *m* in the name is indifferent. The process of reduction is illustrated in the second of the annexed notes.

NOTE I.

EXAMPLES OF THE NINETEEN NAMED MOODS.

Each of the moods is here exemplified twice: first, by a formula framed with symbolic terms, each of which receives the signature of quantity; next, by an argument in significant terms. The matter of all the arguments is gathered from the Preface to Bishop Butler's *Sermons*. There might have been found, probably, apter instances than several of them; but brevity of expression has had to be studied.

FIGURE I.

1. *Barbara*.

A. All M's—are—some P's.

A. All S's—are—some M's.

∴ A. All S's—are—some P's.

A. All beings who on reflection approve virtue—are—beings conscious of obligation to act virtuously.

A. All men—are—beings who on reflection approve virtue.

∴ A. All men—are—beings conscious of obligation to act virtuously.

2. *Celarent*.

E. Any M's—are not—any P's.

A. All S's—are—some M's.

∴ E. Any S's—are not—any P's.

E. Beings conscious of law—are not—beings entitled to disobey law.

A. All men—are—beings conscious of law.

∴ E. Men—are not—beings entitled to disobey law.

3. *Darii*.

A. All M's—are—some P's.

I. Some S's—are—some M's.

∴ I. Some S's—are—some P's.

A. All beings conscious of law—are—beings liable to punishment.

I. Some living creatures—are—beings conscious of law.

∴ I. Some living creatures—are—beings liable to punishment.

4. *Ferio*.

E. Any M's—are not—any P's.

I. Some S's—are—some M's.

∴ O. Some S's—are not—any P's.

E. Beings conscious of law—are not—beings exempt from punishment.

I. Some living creatures—are—beings conscious of law.

∴ O. Some living creatures—are not—beings exempt from punishment.

FIGURE II.

1. *Cesare*.

E. Any P's—are not—any M's.

A. All S's—are—some M's.

∴ E. Any S's—are not—any P's.

E. Parts wanting mutual relation—are not—means conducing to one end.

A. All parts of a system—are—means conducing to one end.

∴ E. Parts of a system—are not—parts wanting mutual relation.

2. *Camestres*.

A. All P's—are—some M's.

E. Any S's—are not—any M's.

∴ E. Any S's—are not—any P's.

Doctrine of inference. A. All parts of a system—are—means conducing to one end.
E. Parts wanting mutual relation—are not—means conducing to one end.
∴ E. Parts wanting mutual relation—are not—Parts of a system.

3. *Festino*.

E. Any P's—are not—any M's.
I. Some S's—are—some M's.
∴ O. Some S's—are not—any P's.
E. Parts of a system—are not—things without a bearing on one design.
I. Some parts of a whole—are—things without a bearing on one design.
∴ O. Some parts of a whole—are not—parts of a system.

4. *Baroco*.

A. All P's—are—some M's.
O. Some S's—are not—any M's.
∴ O. Some S's—are not—any P's.
A. All systems—are—things presupposing mutual relation of parts.
O. Some wholes—are not—things presupposing mutual relation of parts.
∴ O. Some wholes—are not—systems.

FIGURE III.

1. *Darapti*.

A. All M's—are—some P's.
A. All M's—are—some S's.
∴ I. Some S's—are—some P's.
A. All beings obeying the supreme law of their nature—are—beings acting rightly.
A. All beings obeying the supreme law of their nature—are—beings acting naturally.
∴ I. Some beings acting naturally—are—beings acting rightly.

2. *Disamis*.

I. Some M's—are—some P's.
A. All M's—are—some S's.
∴ I. Some S's—are—some P's.
I. Some laws of being—are—laws of supreme obligation.
A. All laws of being—are—laws sanctioned by a penalty.
∴ I. Some laws sanctioned by a penalty—are—laws of supreme obligation.

3. *Datisi*.

A. All M's—are—some P's.
I. Some M's—are—some S's.
∴ I. Some S's—are—some P's.
A. All judgments of reflection—are—laws superior in obligation to mere propensions.
I. Some judgments of reflection—are—judgments of conscience.
∴ I. Some judgments of conscience—are—laws superior in obligation to mere propensions.

(The truth asserted in the minor premise might have been alleged in I². The conversion of the I² into A would throw the argument into the First Figure, and justify a conclusion in A.)

4. *Felapton*.

E. Any M's—are not—any P's.
A. All M's—are—some S's.
∴ O. Some S's—are not—any P's.
E. Judgments of conscience—are not—laws affecting the individual only.
A. All judgments of conscience—are—judgments of reflection.
∴ O. Some judgments of reflection—are not—laws affecting the individual only.

5. *Feriso*.

E. Any M's—are not—any P's.
I. Some M's—are—some S's.
∴ O. Some S's—are not—any P's.
E. Beings obeying laws of their nature—are not—beings acting unnaturally.
I. Some beings obeying laws of their nature—are—beings acting rightly.
∴ O. Some beings acting rightly—are not—beings acting unnaturally.

(Here, again, the datum of the minor premise would justify an I², and enable us to reach, in the First Figure, a conclusion in E.)

6. *Bocardo*.

O. Some M's—are not—any P's.
A. All M's—are—some S's.
∴ O. Some S's—are not—any P's.
O. Some beings obeying laws of their nature—are not—beings acting rightly.
A. All beings obeying laws of their nature—are—beings acting naturally.
∴ O. Some beings acting naturally—are not—beings acting rightly.

FIGURE IV.

(The examples in this Figure are purposely constructed with materials already used for the First).

1. *Bramantip*.

A. All P's—are—some M's.
A. All M's—are—some S's.
∴ I. Some S's—are—some P's.
(The Premises justify the conclusion, in I², "Some S's—are—all P's." See, in the next note, the last of the paragraphs dealing with this mood.)
A. All men—are—beings who approve virtue.
A. All beings who approve virtue—are—beings conscious of obligation to virtue.
∴ I. Some beings conscious of obligation to virtue—are—men.

2. *Camenec*.

A. All P's—are—some M's.
E. Any M's—are not—any S's.
∴ E. Any S's—are not—any P's.
A. All men—are—beings conscious of law.
E. Beings conscious of law—are not—beings entitled to disobey law.
∴ E. Beings entitled to disobey law—are not—men.

3. *Dimaris*.

I. Some P's—are—some M's.
A. All M's—are—some S's.
∴ I. Some S's—are—some P's.
I. Some living creatures—are—beings conscious of law.
A. All beings conscious of law—are—beings liable to punishment.
∴ I. Some beings liable to punishment—are—living creatures.

4. *Fesapo*.

E. Any P's—are not—any M's.
A. All M's—are—some S's.
∴ O. Some S's—are not—any P's.
E. Beings exempt from punishment—are not—beings conscious of law.
A. All beings conscious of law—are—living creatures.
∴ O. Some living creatures—are not—beings exempt from punishment.

5. *Fresiso*.

E. Any P's—are not—any M's.
I. Some M's—are—some S's.
∴ O. Some S's—are not—any P's.
E. Beings exempt from punishment—are not—beings conscious of law.
I. Some beings conscious of law—are—living creatures.
∴ O. Some living creatures—are not—beings exempt from punishment.

NOTE II.

ILLUSTRATIONS OF SYLLOGISTIC REDUCTION.

1. *Extensive or Direct Reduction*.

1. The application of all the rules, except that indicated for two of the moods by c, is obvious and easy. A very few moods will suffice as examples.

FIGURE II.

The structure of this figure is such, that conversion of its major premise throws it into Figure first. That premise, being for Cesare an E, may be converted simply. We thus gain premises which, continuing to be in EA, are good for proving, in Celarent, the E of the *reducens*.

Cesare	Reduced to	Celarent.
The P's—are not—any M's—E.	The M's—are not—any P's—E.	
All the S's—are—some M's—A.	All the S's—are—some M's—A.	
∴ The S's—are not—any P's—E.	∴ The S's—are not—any P's—E.	

Camestres, similarly, would fall into Figure first, if the major premise were converted. But, that premise being an A, its converse would be an I; and the resulting mood would be IE, involving illicit process of the major. If, however, the given pre-

Doctrine of inference.

Doctrine of mises are transposed, they become EA; and the premise which is inference. now the major admits simple conversion into E. The conversion being performed, we have EA, the premises of Celarent. But the terms of the given conclusion have in these premises exchanged functions: therefore, our new conclusion must be the converse of the given one; and the new conclusion may be an E. The process, in fact, is equivalent to the transforming of Camestres into Cesare, followed by the reduction of Cesare to Celarent.

Camestres	Reduced to	Celarent.
All the P's—are—some M's—A. The S's—are not—any M's—E. ∴ The S's—are not—any P's—E.		The M's—are not—any S's—E. All the P's—are—some M's—A. ∴ The P's—are not—any S's—E.

FIGURE III.

Disamis is in the same predicament with Camestres; only that, the Figure being the third, the premise which would suggest itself for conversion is the minor. There would emerge bad premises in II. The remedy is found by reversing the premises, converting the I which has thus become the minor, and giving effect to the reversal by conversion of the given conclusion. The same result would follow, if Datisi were first formed from the given Disamis, and then reduced to Darii by simple conversion of the minor premise.

Disamis	Reduced to	Darii.
Some M's—are—some P's—I. All M's—are—some S's—A. ∴ Some S's—are—some P's—I.		All M's—are—some S's—A. Some P's—are—some M's—I. ∴ Some P's—are—some S's—I.

FIGURE IV.

Fresison has premises which, by simple conversion of both, become EI in Figure first. Therefore it is manageable by this, the process which would naturally be first thought of.

Fresison	Reduced to	Ferio.
The P's—are not—any M's—E. Some M's—are—some S's—I. ∴ Some S's—are not—any P's—O.		The M's—are not—any P's—E. Some M's—are—some M's—I. ∴ Some S's—are not—any P's—O.

Camenes, on the other hand, if so treated, would give premises in II, yielding no conclusion. But Figure first would be gained, also, by transposition of the premises, which would then be those of Celarent. This, with the consequent conversion of the conclusion, is the method ordered.

Camenes	Reduced to	Celarent.
All P's—are—some M's—A. The M's—are not—any S's—E. ∴ The S's—are not—any P's—E.		The M's—are not—any S's—E. All P's—are—some M's—A. ∴ The P's—are not—any S's—E.

Those old logicians, who framed the name Bramantip, followed Boethius in admitting, under the name of Conversion *per accidens*, all conversions in which the *matter* allowed change of quantity, whether by particularizing or by universalizing. When we admit, as we should, no conversions but such as are correct formally, the name is deceptive: its *p* orders an operation which is impracticable. If the given conclusion is to be dealt with at one sweep, what has to be done is the conversion of I, illogically, into A. The rationale of the process (in the more obvious view of it) is this:—The premises, being transposed, become AA in Figure first. They yield, in the nameless mood AAI, a conclusion which is the simple converse of the given one. But they yield also, in Barbara, a conclusion in A. We may adopt the conclusion in A, not as holding it to be a good converse of our I, but because it follows from the premises. We do adopt it, in obedience to the principle of the scheme, that of always inferring, from premises, the widest conclusion they permit. If we still wish for the I, we may earn it lawfully by subalternation from the A.

Bramantip	Reduced to	Barbara (or AAI).
All P's—are—some M's—A. All M's—are—some S's—A. ∴ Some S's—are—some P's—I.		All M's—are—some S's—A. All P's—are—some M's—A. ∴ All P's—are—some S's—A. (∴ Some P's—are—some S's—I.)

But Bramantip should be looked into more closely. Its premises justify a conclusion, not in I merely, but in I²: "Some S's—are— all P's." The simple converse of this is, "All P's—are—some S's," being the A which we have just gained in Barbara. When we conclude in I from the premises of this mood, we are really inferring a subalternate of the conclusion to which we were entitled. Bramantip, however, is the only mood of the nineteen, the analysis of which requires, for its completion, any propositional form besides the received four.

2. Indirect Reduction.

2. The moods Baroco and Bocardo are, in the syllogistic doctrine, the *crux logicorum*. Their inflexibility arises from the double occurrence of O. The character of the conclusion compels us to look for reduction into Ferio; and this mood is not approachable through any of the methods *s, p, m*.

Those who named the two unmanageable moods, were logicians who refused to allow the conversion of O through contraposition. On this footing, it is impossible to transform either of the two into any other syllogism that shall yield, either the given conclusion, or an equivalent of it. We cannot, in the first figure, prove, from the data, that the given conclusion must be true if the premises are so. In short, that which is called ostensive reduction is impossible. But the syllogism may be reduced indirectly. We can prove, not properly in, but only through, the First Figure, that, if the premises are true, the given conclusion cannot be false.

This manner of arguing is founded on the doctrine of contradictory propositions; the two which come into play being O and A, the given conclusion and its contradictory. It is proved that, if the premises of the given syllogism are assumed to be true, the A must be false: whence, by the rule of contradictories, it is inferred that the O must be true. The only assumptions required are two, which are involved in the nature of all inference: first, that the premises of a syllogism are admitted, or are assumed to be true; secondly, that, if the conclusion of a valid syllogism be false, one or both of the premises must be false. The process of which these are the principles is called Indirect Reduction—Reduction *ad impossibile* or *absurdum*, or *ex impossibili* or *absurdo*.

The steps are the following:—The premise denoted by the vowel preceding the *c* is thrown aside; and there is substituted for it the contradictory of the given conclusion. From this new premise (an A), and the retained premise (another A), there is inferred an A in Barbara. The reduction is thus completed, according to the rules symbolized in the name.—But, if we stop here, we have proved nothing to the purpose. Our new conclusion in A has not even the same terms with the given conclusion in O. We have promoted our given middle term to the rank of major in dealing with Baroco, to that of minor in dealing with Bocardo. In effect, the syllogism in Barbara has merely supplied one datum for a process of inference through contradiction, in which the essential part of the operation lies.

The A which is the conclusion in Barbara is found, on comparison, to be the contradictory of the O which was the premise elided from the given syllogism. But this O, as a datum, must be assumed to be true: therefore the A must be false. Now, the A has been inferred validly from its premises: therefore, one or both of these must be false. The premise borrowed from the given syllogism must, as a datum, be true: therefore the falsity must lie in the premise which we constructed for ourselves. But this premise is the contradictory of our given conclusion; and, the contradictory being false (having been proved to be inconsistent with the original data), the given conclusion must be true. Q. E. D.

Baroco	Reduced to	Barbara.
All P's—are—some M's—A. Some S's—are not—any M's—O. ∴ Some S's—are not—any P's—O.		All P's—are—some M's—A. All S's—are—some P's—A. ∴ All S's—are—some M's—A.

A, the conclusion in Barbara, is the contradictory of O, the rejected premise in Baroco: the O being assumed as true, the A must be false. Consequently, one or both of the premises of the Barbara must be false. Its major premise must be assumed as true, having been a premise in the given Baroco: therefore the minor premise must be false. But this minor premise is the contradictory of the given conclusion: therefore the given conclusion must be true.

Bocardo	Reduced to	Barbara.
Some M's—are not—any P's—O. All M's—are—some S's—A. ∴ Some S's—are not—any P's—O.		All S's—are—some P's—A. All M's—are—some P's—A. ∴ All M's—are—some S's—A.

The subsequent inferences proceed, step by step, as for Baroco.

3. The demonstration that a proposed conclusion must be true, because it is impossible that it can be false, is not only always cumbrous, but also, in many instances, slow in generating conviction. It is never used, by logicians or by others, when it can be escaped from. Yet it is of common use and very wide application. Even axioms, whether popular or philosophical, may have their meaning, if not their truth, brought out more clearly, when it is shown that the denial of them must lead to consequences which are absurd. In controversy, demonstration through impossibility lies at the root of the argument *ad hominem*: an opponent denying a conclusion of ours, we endeavour to prove that his denial is contradictory of propositions which he himself admits. In geometry, indirect demonstration is familiar; and the name, *Reductio ad absurdum*, which mathematicians are wont to give it, comes from its syllogistic application, and is needlessly retained when reduction is not aimed at.

It may be worth while to observe two points of difference, between the logical uses of indirect demonstration on the one hand, and the scientific and popular uses of it on the other.

First, In the search for propositions whose truth is inconsistent with the falsity of a proposition to be proved, an expounder of the

Doctrine of inference. exact sciences has before him a field of choice broadening with every truth he has already been able to prove. The impossibility of the falsehood of a theorem is demonstrable through the inconsistency of the falsehood with any of the truths which, whether as axioms or as propositions proved, have previously received a place in the system. Even in questions involving contingent truths the position of a reasoner is not dissimilar to this.—Contrariwise, in the indirect reduction of a syllogism, the logician can assume nothing except his two premises. But, as we have learned, nothing else is necessary. The logical procedure is, in fact, with the one exception of its working towards the first figure, the very same process which is and must be followed, in all demonstrations through contradiction. The search for data is only a gathering of the materials, out of which is woven a chain of reasoning, every link of which depends on the law of contradiction, and is transmutable into the strictest logical forms.

Secondly, In mathematics always, in other kinds of matter not seldom, the inconsistency founded on lies between propositions logically describable, not as contradictories, but only as contraries: that is, it lies between E and A. Why, it may be asked, is this sufficient? For plain reasons, indicating very frequent cases. In the first place, contraries cannot both be true: if we can hold the one to be true, we may infer the falsity of the other. Again, in the exact sciences, it is evident that no propositions are particular: all are either universal or singular. Therefore the law of contradiction presses from all sides on the contraries, with the same force as on contradictories when they are possible. This remark might be stretched very far indeed beyond the bounds of the sciences treating number and quantity. All philosophical doctrines, whether of mind or of matter, are strictly universals. But the illustration of this point would lead us much out of our way.

3. Reduction through Contraposition.

4. Contraposition, and Conversion of the Contraposita, being allowed for O and A, Baroco and Bocardo may be reduced directly or ostensively.

The principle of the process appears most clearly, when we suppose the contraposition to be first completed, to the effect of throwing the syllogism into another mood in the same figure. In the second figure, our negative conclusion must be retained: therefore, for Baroco, we must transform the AO of the premises into EI. The syllogism thus passes into Festino. Indeed, in framing a syllogism from given materials, it is often a matter of indifference which of these two moods we throw it into. The relation between Baroco and Festino is paralleled, in the third figure, by that between Bocardo and Disamis: the transformation is here effected by transforming each of the O's into an I. The syllogisms thus framed, in Festino and Disamis, are then subject to the ordinary rules of Ostensive Reduction.

Some of the logicians who admit this method, have emulated the schoolmen in the fabrication of names, designed to intimate, like the old ones, the manner of performing the process at one step. In these names, the *c* denotes conversion, through contraposition, of the preceding proposition: *m* denotes transposition of premises as before. In this way, Baroco is represented by Facoro, and Bocardo by Docamo. But these names, though adopted by Whately, fail to point out all the steps. If we must have names, exactness would require such as these still more whimsical ones—Facoco, Docamoc.

Baroco, thus treated, gives a syllogism in Ferio, proving the given conclusion. Bocardo gives a syllogism in Darii, proving the converse of the contraposita of the given conclusion.

The reduction, whether taken at one step or in two, requires no illustration beyond the examples.

BAROCO—Reduced (through Festino) to—FERIO.

1. Baroco.

All P's—are—some M's—A. The P's—are not—any things—not M's—E.
Some S's—are not—any M's—O. Some S's—are not—any things—not M's—E.
∴ Some S's—are not—any P's—O. ∴ Some S's—are not—any P's—O.

2. Festino.

The P's—are not—any things—not M's—E.
Some S's—are not—any things—not M's—E.
∴ Some S's—are not—any P's—O.

3. Ferio.

Things not M's—are not—any P's—E.
Some S's—are—some things not M's—I.
∴ Some S's—are not—any P's—O.

BOCARDO—Reduced (through Disamis) to—DARII.

1. Bocardo.

Some M's—are not—any P's—O. Some M's—are—some things not P's—I.
All M's—are—some S's—A. All M's—are—some S's—A.
∴ Some S's—are not—any P's—O. ∴ Some S's—are—some things not P's—I.

2. Disamis.

Some M's—are—some things not P's—I.
All M's—are—some S's—A.
∴ Some S's—are—some things not P's—I.

3. Darii.

All M's—are—some S's—A.
Some things not P's—are—some M's—I.
∴ Some things not P's—are—some S's—I.
∴ Some S's—are—some things not P's—I.
∴ Some S's—are not—any P's—O.

4. Wider Applicabilities of Reduction.

5. If the Reduction of syllogisms were merely a game to be played at (and sometimes it has been elaborated till the practical sinks out of sight), the ball might evidently be tossed from any of the four quarters of the field, and pass from any one hand into any other. It would be difficult to exhaust, for any given syllogism, the possibilities of metamorphosis through such operations as the rules of reduction allow.

In transferring imperfect syllogisms to the first figure, the quality of the propositions would raise no very strong barrier between the affirmative moods and the negative: the quantity of the terms would fix the only peremptory limit. Reduction *ex impossibili* is as apt, and as easy, for any other moods, as for the two which have a monopoly of it; although, for some of them, we should have to be content with arguing from the contrary instead of the contradictory. Further, moods of any figure might be changed into moods of any other.

The scrutiny of syllogisms for such purposes as this, does, in more instances than one, point to curious relations between moods, all of them traceable ultimately to the fundamental laws. The inquiry might be made, in logical teaching, a useful discipline of sagacity and exactness; and it might also draw the study of the syllogism away from that mechanical reliance on rules, into which the very symmetry and completeness of the scholastic system are apt to make it degenerate.

But the results have no claim to reception in an outline of logical science.

DIVISION II.—THE SYLLOGISM ANALYSED IN EXTENSION AND COMPREHENSION.

88. If we were to be content with possessing a set of The bearing of the wholes of predication on the structure of the syllogism. rules enabling us to test, easily and infallibly, the conclusiveness of every argument that could be proposed, the syllogism would have been dissected deeply enough, when it had yielded the two canons, and the corollaries flowing from them. Differences of figure would have no importance: the process of reduction and its principle might, with equal safety, have been left unexamined. If, again, seeking for a higher law, we still aimed only at forcing the indirect moods into the precinct over which the *dictum* bears sway, the end would have been attained when the study of the scholastic scheme had put it in our power to transform every imperfect syllogism into one of the perfect forms which are to be found in the first figure.

But, while the canons, and the rules of reduction, have each a substantive logical value, the syllogism is most incompletely understood, if it is studied only through either of those media, or even through both. The former, taken alone, would leave us where we should be left, in biological science, if we had qualified ourselves only for distinguishing and describing a part of the animal body, without having learned anything as to the physiological relations between the given object and others. By the latter method, on the other hand, we should, indeed, begin the study of functions; but we should drop it before having gone further than the collection of data: our position would be that of the anatomist, who, after having microscopically determined the structure of the animal tissues, should refrain from asking how that structure affects the action of the organs which the tissues constitute.

Reasoning through common terms has pre-formed classifications as its data. It is merely an explication, an evolution into the form of judgments and propositions, of relations implied in a presupposed ordination of the concepts and terms.

What the ordination is, that is presupposed in a given process of mediate inference, we ascertain at a glance when the syllogism is in the first figure. In that figure we infer, in regular descent of extension, from term containing to term contained; from the major, through the middle, to the minor. This order of the terms is necessarily, for the first figure, the order of extension assumed in the pre-formed series of terms. The order of comprehension is, of course, that order reversed.

Doctrine of inference.

Doctrine of inference. What the presupposed ordination of terms is, in a syllogism in any of the indirect moods, is learned through the relation of that mood to a mood in the first figure. That relation has been exhibited to us, for all the indirect moods, in the Rules of Reduction. Though reduction should in itself be held worthless, its rules are invaluable, as facilitating progress to something beyond them. They are premises, regularly and completely arranged, from which may be inferred, more easily by far than if we wanted them, the true relations of the several syllogistic figures, the truths in virtue of which each of the figures has a place, though not all a place equally high, in the actual system of human intelligence.

The rules bridge over, for occasional passage, the gap which yawns between the first figure and the others. Where their foundations are dug into, modes of thought are laid bare, which unite all the figures into one symmetrical formation.¹

¹ The principle which it is here attempted to bring to bear on the syllogism, is that whose positive applicability to such a use may fairly be said to have been undreamt of till it was declared by Sir William Hamilton, and which has hitherto been so applied by him alone. (See Note to Section 33.) Those students of the science (and they do seem to be as yet few) who, in their inspection of Hamilton's logical system, have advanced, from his doctrine of quantification, to this deeper-lying section of his theory, will perceive already, that the purpose for which the principle is here used is different from his;—if, indeed, those scanty notices, which only have hitherto been made public, entitle us to judge precisely as to his views of the ultimate bearing of the principle.

Both in the *New Analytic*, and in Hamilton's own Appendix to the *Discussions*, the point which comes out most prominently is, the reducibility of all the three receivable syllogistic figures under one law. The characteristic differences of the three figures, as traceable to the wholes in which their propositions severally predicate, are, indeed, exhibited to demonstration; but reduction of the second and third figures to the first seems to be condemned, as a process both needless and unscientific. The opinion which has forced itself on the present writer is this: that the first figure, as founded on the ordained hierarchy of the three terms, while the others are not so, must retain its Aristotelic pre-eminence; that the functions of the other figures, as expressions for processes of thought, do not appear clearly unless through comparison with the first figure; that reduction by the common rules gives the only means of such a comparison; and that the view here taken of conversion, as a transference of predication from whole to whole, reconciles reduction completely to the true theory of the relation between extension and comprehension.

Trendelenburg, it was already observed, asserts peremptorily the necessity for considering both wholes, if we are to have a philosophical theory of the syllogism. But he treats the question quite generally, and also (it may rightly be said) no more than negatively. Even here, he stands much closer to Schleiermacher than to Hamilton. He maintains the insufficiency of the analysis in extension: but, taking his position as an out-and-out adversary of the Formal Logic, he abstains from all attempts at positive application of the principle to the formal syllogistic scheme. Indeed, his comparison of the wholes leads him, at once, on to that objective ground, on which he aspires to founding logical science. That the distance between his point of view and Hamilton's may be the more clearly seen, there are here set down, from his *Logische Untersuchungen* (sect. xvi., vol. ii.), a few of those passages in which his opinions appear with the smallest admixture of the metaphysical element.

After having observed that the usual form of the "Dictum" contemplates extension, and that the "Nota notæ" contemplates comprehension, he proceeds thus: "The syllogism emerges out of the reciprocal reference of comprehension and extension. If the comprehension of a concept (the positive or negative law) is applied to its extension, there arises the *categorical* syllogism. The comprehension (major term) of a concept (middle term) governs its extension (any of the species, minor term). If, on the other hand, the same law is expressed for all the species, and if, out of this content (or comprehension) of the extension, the comprehension of the containing universal is collected, there arises the *disjunctive* syllogism. The species constitute the middle term, or concept, whose comprehension becomes the comprehension of the genus." (Pp. 239, 240). . . . "Comprehension and extension, in the relation of Law and Phenomenon, constitute the essential elements (*Seiten*) of the concept; and their reciprocal relation constitutes

89. Two preliminary points require to be considered, for enabling us to extricate, out of the received syllogistic doctrines, all the relations of the syllogism, both to the extension and to the comprehension of its three terms. The differences in the character of predication between the first figure and the other three.

In the first place, the forms of predication, on the analysis of which the received system rests, are those in which the terms are concrete, not abstract. It is, in fact, all but impossible, as we have already seen, to express intelligibly differences of quantity, when abstract terms are adopted throughout; while, likewise, the union of concrete terms with abstract, both betrays and causes confusion of thought. Concrete terms, however, point directly to predication in extension; and this is one of several reasons why the relation of comprehension has been so much overlooked.

Secondly, the conversion of a proposition is nothing else or more than the transference of predication from the one whole into the other. When this doctrine is called to mind, it becomes evident how thoroughly the relations of the figures to the wholes are implied in the rules of reduction.

These considerations being premised, it is the easiest thing in the world to mark, for all syllogisms whose propositions are either A, E, I, or O, the whole in which every one of the propositions predicates.

Considered without reference to the wholes of predication, the three receivable figures severally exhibit the three terms as formally ordained in this way. In figure first, the middle stands between the minor and the major; in figure second, the middle stands above both of them, the one being predicated in, the other out of it; in figure third, the middle stands below both of them, being predicated in both, or in the one and out of the other. When we have discovered in which of the wholes it is that each of the predications takes place, we have discovered also how it is, that, in the second and third figures, the middle term has come to hold a position different from that which should belong to it, as being the connecting link of thought between the minor and the major.

I. In the first figure, each of the three propositions is a Predication in Extension. The minor term is placed in the extension of the middle, the middle in the extension of the major, or of its contradictory; and, consequently, the minor is placed in the extension of the major, or of its contradictory.

Clearly, too, by converting all the three propositions, we should gain three propositions in comprehension. If, indeed, we are prohibited from adopting any propositional forms except the received four, the syllogism formed must be bad. But if the conversion were made thorough, through additional forms, the new syllogism would not violate, either the law of mediate inference, or any of the common rules. This view, however, is neglected in the books.

its life." (P. 241). . . . "What vouches, then, for the completeness of the forms of the syllogism? The comprehension is referred to the extension; and out of the extension the comprehension is determined, and that both positively and negatively." (P. 248). . . . "Must the syllogism, then, be nothing but a subjective function without a real counterpart? No. The comprehension, representing the law of the extension, contains the possibility of the syllogism; and therein also is its objective value intimated. To the *genetic* universal, which rests on an original community of thought and existence, there corresponds the *quantitative* universal. The necessary ground (reason) hence clothes itself in the expression of a universal fact, and becomes, in this form, the middle concept of an objective syllogism. That which, in the real, is the ground (reason), becomes, in the logical, the middle term of the syllogism. Aristotle himself acutely pointed out this parallelism. (*Analyt. Post.* ii., 2, 11, 12; *De Anima*, ii., 2: compare Trendelenburg's *Elementa Logices Aristotelicae*, § 58, &c.) But the formal logic, which would have nothing to do with the real, allowed this profound suggestion to lie unused." (P. 280).

Doctrine of inference. whole. In a word, the first figure predicates exclusively in one whole.

II. None of the other three figures predicates exclusively in one whole. In each of them, two of the propositions are predications in the one whole; while the third is a predication in the other.

The several indirect moods stand in two several relations to the first figure, indicated respectively by their requiring or not requiring, in reduction, transposition of premises, and consequent conversion of the conclusion. This difference makes it impossible to lay down, for syllogisms expressible through the four received forms of predication, laws systematically distinguishing each of the indirect figures from the others. But an approach is made to such laws in the following statement:—

Figure II.

In *Cesare*, *Festino*, and *Baroco*, the major premise predicates in comprehension; the minor and the conclusion predicate in extension. In *Camestres*, whose premises in this order are bad for the first figure, the major premise predicates in extension; the minor and the conclusion predicate in comprehension. In this figure, for all moods, the whole in which the minor premise predicates, determines the whole predicated in by the conclusion.

Figure III.

In *Darapti*, *Datisi*, *Felapton*, and *Feriso*, the minor premise predicates in comprehension; the major and the conclusion predicate in extension. In *Disamis* and *Bocardo*, whose premises (equivalents through contraposition) are in this order bad for the first figure, the minor premise predicates in extension; the major and the conclusion predicate in comprehension. In this figure, for all moods, the whole in which the major premise predicates, determines the whole for the conclusion.

Figure IV.

In *Bramantip*, *Camenes*, and *Dimaris*, both premises predicate in extension; the conclusion predicates in comprehension. In *Fesapo* and *Fresison*, both premises predicate in comprehension; the conclusion predicates in extension. In the moods whose premises must be transposed to pass into the first figure, the conclusion is in comprehension; in those whose premises do not require transposition, the conclusion is in extension.

The predications of the first figure analysed in extension.

90. The general character of the First Figure has already come out so clearly, as to call, now, for no special explanation.

It is distinctively the form of Deductive Thinking. It presupposes the classification of objects in the progressive order of generalization; and, starting from the widest class, it infers, through a class intermediate, the inclusion of a lowest class within the sphere of the highest.

A principle or law, assumed as already established, is inferred to govern or not to govern a given case, because it is asserted that the given case is included in a class of cases which are known to be governed or not to be governed by the assumed law or principle. The given case S is included in the class of cases M; the whole class of cases M is governed by the law P or Not-P: therefore the case S is governed by the law P or Not-P. Or, otherwise, for negatives, the case S is included in the class of cases M; the whole class of cases M is excluded from the cases governed by the law P: therefore the case S is excluded from the class of cases governed by the law P. The ordination of terms is, always, from most to least extensive, P (or Not-P), M, S.

There thus appears, first of all, the distinction between the two Affirmative moods of the figure, *Barbara* and

Darii, and the two Negative moods, *Celarent* and *Ferio*. Doctrine of inference. The difference arises wholly out of the quality of the assumption made in the major premise. That premise determines the conclusion to affirmation or to negation. When it is affirmative, the inclusion of the terms is direct in all its three steps. When it is negative, the inclusion in the second step, and, consequently, that in the third, may still be held to be a direct inclusion in the contradictory of the major. But the laws of ordination would allow us, also, for negatives, to hold the second step as being an exclusion of co-ordinates (M excluded from the extension of P), and the third step, consequently, as an exclusion of a subordinate from a co-ordinate of its superordinate (S excluded from the extension of P).

Next appears the distinction between the two Universal moods, *Barbara* and *Celarent*, and the two Particular moods, *Darii* and *Ferio*. This difference arises wholly out of the quantity of the subsumption made in the minor premise. According as all of the S's, or only some of them, are placed in the middle term, so all, or only some, are inferred to be in, or out of, the major. The difference may, in effect, be considered as accidental: it arises properly out of our poverty in class-names. The objects designated by our minor term are for us a whole: they are a whole which we are not compelled to regard as constituted by parts: they are our lowest datum, which must pass, through the middle term, into or out of the major, without change or analysis. In this figure, indeed, the minor term may be a singular, without any impinging either on principle or on form. If we give to the minor term the signature "some," this is only because we have not a name narrow enough to yield "all:" we cannot specificate the objects more exactly than by saying, that they are "some" of the objects constituting the class S. If we were to describe them as "All the objects which are called some S's," we should have ground for a universal conclusion: and this suggestion may help to show how these particular moods are really inessential variations of the universal ones.¹

91. The mutual dependence of comprehension and extension makes inference to be possible, though the deductive sequence of the terms is departed from. But the departure imposes limitations, either on the quality of the conclusion or on its quantity.

When the sequence is deserted in the premise which either is the *major* as given, or would be the major if the sequence were obeyed, the conclusion is made *negative*. This is the predicament of the Second Figure. Its characteristic shortcoming, when looked at from the objective side, lies in this. While it asserts, in its lowest step, the minor premise, that S is one of the class of cases M, it does not assert, in the major premise, either that the class of cases M is included under, or excluded from, the operation of the law P. Hence there are no data for affirmation: and it is only indirectly that even negation is justified.

I. The normal character of the figure is exhibited by *Cesare*, and its subalternate mood *Festino*. In the minor premise of these, the foundation is laid for a deductive argument. The minor is placed in the extension of the middle. But there does not follow a major premise, which shall place

The predications of the second figure in both wholes.

¹ This universalizing of the minor term would be useful, also, if we were to attempt expressing *Ferio* in comprehension. It would enable us to dispense altogether with Hamilton's partial negatives. It serves the same use in the second and third figures, for moods which have the conclusion in O. For the universalizing may be used, in the indirect figures, not indeed always for the minor term, but always for the term which would be the minor if the syllogism were reduced to Figure first. *Festino* is thus manageable directly, *Baroco* through it, but not otherwise; *Felapton* and *Feriso* directly. *Bocardo* cannot discard the partial negatives in comprehension, unless by being transformed into the affirmative mood *Disamis*: *Fesapo* is independent of them, without being universalized.

Doctrine of the middle term either in or out of the extension of the inference. major. We turn abruptly round, and predicate in comprehension. The placing of the major in the comprehension of the middle would plainly determine nothing, the middle having in the other premise been considered only in part. Therefore we exclude the major term from the comprehension of the middle.

II. The necessity of transforming *Baroco* into *Festino*, through contraposition, if it is to exhibit the ordination of terms in any workable shape, is prognosticated by its initial step. Its minor premise excludes the minor from the extension of the middle, and thus seems to bar all further progress.

III. *Camestres* is merely *Cesare*, with the premises misplaced, and with the legitimate functions of the minor and major terms consequently interchanged.

The predications of the third figure in both wholes.

92. The position of the Third Figure is this. It deserts the sequence of deduction in its initial step: its *minor* premise, or that which is the minor when the deductive sequence is established, predicates in comprehension. The consequent limitation of the result falls on the quantity: the conclusion is necessarily *particular*.

The root of the restriction lies in the opposite quarter from that which made the second figure negative. The compass of the law P is here definitively fixed, either positively or negatively; but the cases to be placed within the law, or out of it, are assumed as being only a part of S. The reason is, that, in our lowest step, we want the clue to the ordination. We are not able to assert, in our minor premise, that the S's, or any of them, are in the class of cases M: we are able to assert, only, that the cases M, or some of them, possess the attribute S; and, not holding ourselves entitled to aver that they are in exclusive possession of that attribute, we say only that the M's, or some of them, are some of the S's. Accordingly, when, in our major premise, all the M's have been asserted to be under, or free from, the law P, it is only of some of the S's that we can infer the subjection to the law, or freedom from it.

The moods of this figure, when they are examined with reference to the deductive sequence of terms, and the consequent relations to the first figure, are found to fall into three classes. In scrutinising all of these, we must remember that, as a consequence of the imperfection of knowledge implied in the lower of the premises, the minor term must pass through the syllogism unchanged, as "some S's."

I. The character of the figure appears most purely in *Datisi*, and the parallel negative, *Feriso*. The particularity of the minor term being kept in view, the terms appear as rising by steps, each of which is a part only of the higher. Our "some S's" are a part of the class M; the whole class M is a part of the class P (or Not-P): consequently the "some S's" are a part of the class P (or Not-P). The data do not exceed the minimum required for justifying the result.

II. In *Darapti*, and its negative *Felapton*, the data do exceed the minimum; for, though the subsumption is wider than in the first two moods, the conclusion is not so. When all the propositions have been made predications in extension, their import, quantities being fully expressed, is this: "Some S's are all M's; all M's are some P's (or Not-P's): therefore some S's are some P's (or Not-P's)." The class which, for want of a more precise name, we call "some S's," is not, as before, a part of the class M: it is identical with that class, or constitutes the whole of it. The subordination of the minor term to the middle is merely formal; and even the appearance of subordination vanishes when the minor premise is fully converted. The ordination presupposed is not genuine. "Some S's" and "all M's" are equipollent terms, identical both in extension and in comprehension.

III. *Disamis*, and its negative *Bocardo*, are in the same situation as *Camestres*. *Disamis* takes a circuitous path to reach the conclusion of *Datisi*: and *Bocardo*, going still further astray, by starting from a negation in its lower premise, cannot be brought to exhibit the deductive relations of its terms, otherwise than by a process which is equivalent to its passage through *Disamis*.

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93. The rules for reduction exposed the Fourth Figure, as being a deformed variety of the first. Inspection of the wholes of predication at once renders the reason of the rules, and shows the source of the clumsiness.

The five moods fall obviously into two classes, differing diametrically in the character of their deviations from the deductive progress.

The predications of the fourth figure in both wholes.

I. In *Bramantip*, *Camenes*, and *Dimaris*, we have received good premises for *Barbara*, *Celarent*, and *Darii*: and we retain these as predications in extension. But we misplace them; or, without misplacing, we mistake the functions of the major and minor terms. From our premises in extension, we draw, by a sudden inversion, a conclusion in comprehension.

II. In *Fesapo* and *Fresison*, both premises predicate in comprehension. These would yield, also, in comprehension, good conclusions, but only in $\frac{1}{2}E$, unless we were to universalize the minor term. The conclusions which we do infer are predications in extension. *Fesapo*, again, is, in respect of ordination, situated similarly to *Felapton*.

It is plain that, in neither of the classes, does the character of the premises present any feature entitling the figure to be ranked as natural or independent. In the moods of the first class, we have simply misused premises which are good for the first figure, and which are expressed in a form fitting them for convenient use. In the moods of the second class, the difficulty of managing the given predications in comprehension does make it more difficult, but still not impossible, to reach the pure deductive sequence. If the figure had any claim to a place in the legitimate system, it could only be in respect of these two moods, or rather in respect of *Fresison* alone.

94. A Proposition must be a Predication in one Whole. But every proposition may, through conversion, become a predication in the whole opposite to that in which it was given. Consequently, every one of the nineteen or twenty-four syllogisms of the scholastic scheme might be made to assume a new form, by having each of its three propositions converted.

The transformatibility of all syllogisms by exhaustive conversion.

The new syllogisms, however, would correctly represent the old, on this condition only, that the conversion should everywhere be not only safe but exhaustive. Not only must no term be distributed in the converse, which was undistributed in the convertend; but, also, no term must be undistributed in the converse which was distributed in the convertend. Clearly, if this requirement were not complied with, the converted syllogisms might, through failure of distribution, contain fallacies of quantity not committed in the syllogisms from which they had been formed.

The condition, however, cannot be fulfilled through methods of conversion obeying the common rules, or confined to the four propositional forms A, E, I, O.

Ordinary speech, like ordinary thinking, proceeds by preference in the whole of extension: we never do, continuously or systematically, either think or speak in comprehension. The received doctrine of predication, and the syllogistic theory which assumes it, are alike accommodated to this universal tendency. The four propositional forms are designed, and are adequate, to express processes of thought, which are conducted explicitly in extension, comprehension being only silently implied. The mediæval theory of the categorical

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sylogism, in which the doctrine of predication receives its highest development, takes for granted predication in extension only. Accepting the first figure as the norm, it lays down, indeed, general principles, which are correctly applicable to propositions expressed in either whole: but its whole array of specific rules is worked out on the supposition, that the propositions of that figure predicate in extension, and not otherwise.

In every one of the indirect moods there are, as we have discovered, propositions which, extension being accepted as the form of the first figure, must be interpreted as predications in comprehension, in virtue of that ordination of terms, of which the first figure is an explication. No serious difficulty arises hence, so long as we rest satisfied with treating syllogisms in the scholastic fashion. Almost all those propositions in comprehension, which appear in any of the indirect moods, are expressible in one or another of the four established forms: indeed, the genuine conclusion of *Bramantip* is the only exception. Even though we pass to reduction, those forms are sufficient for exhaustive conversions in all cases, except the minor premises of the three anomalous moods, *Darapti*, *Felapton*, and *Fesapo*.

If, however, we aim at a conversion of *all* the propositions of a syllogism, there is not found, among the fourteen named moods of the three genuine figures, any one for which the A, E, I, O are sufficient. The I² is peremptorily called for as expressing the only thorough converse of A. Even the $\frac{1}{2}$ E, too, would have to be taken as the converse of O if conversion of it were insisted on. This weak form is indeed avoidable, through universalizing of minor terms, for all moods except *Baroco* and *Bocardo*: but for these it is inevitable, unless we hold (as we ought) that they are not directly expressible through conversion.

To a series of syllogisms thus made up almost all the specific rules of the common system would clearly be inapplicable. But it is a test of the soundness of the orthodox system, so far as it goes, that all the principles on which its rules are founded tell on the transformed syllogisms with undeviating exactness.

The predi-
cations of
the first
figure ana-
lyzed in
compre-
hension.

95. The possibility of thus setting forth any syllogism of the common scheme in each of two convertible shapes, is a point of doctrine for which we cannot be too thankful. It is at once a decisive proof, and an instructive illustration, of that theory of the counter-relations connecting the wholes of a concept, without which the laws of the syllogism are left destitute of a firm philosophical foundation.

But nothing of a practical applicability seems to be attainable through the exhaustive transformation of the received moods. It is enough, at all events, for the purpose here in view, that the process be exemplified by exhibition of the forms which the Named Moods of the First Figure put on, through exhaustive conversion of all their propositions.

The premises in extension are here set down in the usual order. For expression of the syllogism in comprehension, they must of course be transposed; since the conversion of the conclusion makes its terms exchange functions.

BARBARA.

1. In Extension.

Major Premise All M's—are—Some P's (A).
Minor Premise All S's—are—Some M's (A).
Conclusion ∴ All S's—are—Some P's (A).

2. In Comprehension.

Major Premise Some M's—are—All S's (I²).
Minor Premise Some P's—are—All M's (I²).
Conclusion ∴ Some P's—are—All S's (I²).

CELARENT.

1. In Extension.

Major Premise Any M's—are not—Any P's (E).
Minor Premise All S's—are—some M's (A).
Conclusion ∴ Any S's—are not—any P's (E).

2. In Comprehension.

Major Premise Some M's—are—all S's (I²).
Minor Premise Any P's—are not—any M's (E).
Conclusion ∴ Any P's—are not—any S's (E).

DARII.

1. In Extension.

Major Premise All M's—are—some P's (A).
Minor Premise Some S's—are—some M's (I).
Conclusion ∴ Some S's—are—some P's (I).

2. In Comprehension.

Major Premise Some M's—are—some S's (I).
Minor Premise Some P's—are—all M's (I²).
Conclusion ∴ Some P's—are—some S's (I).

FERIO.

1. In Extension.

Major Premise Any M's—are not—any P's (E).
Minor Premise Some S's—are—some M's (I).
Conclusion ∴ Some S's—are not—any P's (O).

2. In Comprehension.

Major Premise Some M's—are—some S's (I).
Minor Premise Any I's—are not—any M's (E).
Conclusion ∴ Any P's—are not—some S's ($\frac{1}{2}$ E).¹

¹ The Toto-Partial Negative in *Ferio* is avoidable, if, adopting a hint already thrown out, we read the mood as *Celarent*, by interpreting the minor term as distributed: "All the things we call some S's." Its transference to comprehension then yields again I²EE.

If, throwing aside figure fourth, we do thoroughly convert all the propositions of all the fourteen named moods in the others, we double our list of admissible moods. The twenty-eight thus appearing are just so many of Mr Thomson's or of Sir William Hamilton's. It may be convenient, both for students of those systems, and for any who may wish to test minutely the suggestions here offered, that the twenty-eight be summarily identified with the corresponding moods of those authors. Mr Thomson (p. 248), has tabularized all Sir W. Hamilton's moods, translating the names into his own symbolic letters. A, E, I, O, retain their old significations: our A², Hamilton's toto-total affirmative, is Thomson's U; our I², the parti-total affirmative, is his Y; our $\frac{1}{2}$ E, the toto-partial negative, is η ; our $\frac{1}{2}$ O, the parti-partial negative, is ϵ . Our own symbols, here to be repeated, are easily interpretable into either of the other sets.

The formal outline of Hamilton's scheme is this. The first three figures only are admitted. The eight possible forms of predication being accepted, there are, in each figure, twelve valid affirmative moods. Each of these yields in each figure two negative moods: No. 1, by making the major premise negative; No. 2, by making the minor premise negative. There are thus, in each of the three figures, 36 moods: 12 Affirmative, and 24 Negative. Sir W. Hamilton's moods are, accordingly, 108 in all. Mr Thomson reduces the number to 63, by rejecting 45 moods, which introduce $\frac{1}{2}$ E or $\frac{1}{2}$ O, or both.

In identifying the moods, we must bear in mind certain consequences of the conversion. By converting the conclusions, we make transposition of premises necessary for all the three admitted figures. The conversion, also, throws the Second Figure into the Third, and the Third into the Second.

In the Fourth Figure, conversion of all propositions would only displace one anomaly to make room for another. Not recognised in the new scheme, it can be treated only by having all its predications thrown into the same whole, and the premises arranged for the first figure. If they are all expressed in extension, we gain, except for one mood, named syllogisms of the common scheme; and its moods, so treated, may then be transferred, if we will, to comprehension.

In the following summary, the Named Moods, and their converse equivalents, are referred to the numbers which the Affirmatives bear in Mr Thomson's table, from i. to xii., the Negatives under each being noted as 1 and 2.

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THE NINETEEN MOODS.

FIGURE I.

1. Common Form.

1. BARBARA.....AAA — No. iii.
2. CELARENT.....EAE — From No. ix., A²AA: Neg. 1.
3. DARI — No. v.
4. FERIO.....EIO — From No. xi., A²II: Neg. 1.

2. Converted Form.

1. BARBARA.....I²I²I² — No. iv.
2. CELARENT.....I²E²E — From No. x., I²A²I²: Neg. 2.
3. DARI.....II²I — No. vi.
4. FERIO.....LE²I — From No. xii., IA²I: Neg. 2.

FIGURE II.

1. Common Form.

5. CESARE.....EAE — From No. ix., A²AA: Neg. 1.
6. CAMESTRES.....AEE — From No. x., AA²I: Neg. 2.
7. FESTINO.....EIO — From No. xi., A²II: Neg. 1.
8. BAROCO.....AOO — From No. iv., AI²I²: Neg. 2.

2. Converted Form; yielding Figure III.

5. CESARE.....I²E²E — From No. x., I²A²I²: Neg. 2.
6. CAMESTRES.....EI²E — From No. ix., A²I²A: Neg. 2.
7. FESTINO.....IE²I — From No. xii., IA²I: Neg. 2.
8. BAROCO..... $\frac{1}{2}$ EI² $\frac{1}{2}$ E — From No. iii., AI²A: Neg. 1.

FIGURE III.

1. Common Form.

9. DARAPTI.....AAI — No. ii.
10. DISAMIS.....IAI — No. vi.
11. DATISI.....AII — No. v.
12. FELAPTON.....EAO — From No. vii., A²AI: Neg. 1.
13. FERISO.....EIO — From No. xi., A²II: Neg. 1.
14. BOCARDO.....OAO — From No. iv., I²A²I²: Neg. 1.

2. Converted Form; yielding Figure II.

9. DARAPTI.....I²I²I — No. ii.
10. DISAMIS.....I²II — No. v.
11. DATISI.....I²I — No. vi.
12. FELAPTON.....I²I²E — From No. viii., I²A²A: Neg. 2.
13. FERISO.....IE²I — From No. xii., IA²I: Neg. 2.
14. BOCARDO.....I² $\frac{1}{2}$ E² $\frac{1}{2}$ E — From No. iii., I²AA: Neg. 2.

FIGURE IV.

1. Common Form.

15. BRAMANTIP...AAI(=rather I²) — Unacknowledged.
16. CAMENES.....AEE — Unacknowledged.
17. DIMARIS.....IAI — Unacknowledged.
18. FESAPO.....EAO — Unacknowledged.
19. FRESISON.....EIO — Unacknowledged.

2. Re-arranged Form; yielding Figure I. in Extension.

15. BRAMANTIP...AAA — No. iii. (=Barbara).
16. CAMENES.....EAE — From No. ix., Neg. 1: (=Celarent).
17. DIMARIS.....AII — No. v. (=Darii).
18. FESAPO.....EI²O — From No. viii., A²I²I²: Neg. 1.
19. FRESISON.....EIO — From No. xi., Neg. 1: (=Ferio).

When *Fesapo*, as thus thrown into the first figure, is transferred from extension to comprehension, it gives AB $\frac{1}{2}$ E, from No. viii., AA²A, Neg. 2. The readings of the other moods of the fourth figure in comprehension, are supplied by the named moods of the first figure.

DIVISION III.—THE FUNCTIONS OF THE SYLLOGISM AND OF THE SYLLOGISTIC FIGURES.

Abbreviations of thought, and sup-pression of steps in reasoning.

96. Thought is more rapid than speech, by an excess which hardly can be over-estimated. Of the characteristics common to all languages, as well as of those which are peculiar to each, an immense proportion are, as it has justly been said, nothing else than expedients devised for the purpose of abbreviation. The inequality of the race causes diversity in the kinds of motion. Thought may proceed by steps; language, in the endeavour to keep

up with it, must and does advance by leaps. When we throw our thinking into words, though it be only in self-communing, we continually pass, with a bound, over those steps which, for ourselves, are plainly and necessarily implied: when we aim at imparting our thoughts to others, we suppress similarly everything which it seems safe to leave in implication.

The desire of compression becomes especially active when concepts are the elements; for here we are forced on words, on common terms, as well in silent thought as in utterance. This is one of the causes why, although imagination may dart from object to object with the swiftness of the telegraphic flash, reasoning, burdened by its weight of words, must travel from truth to truth with comparative slowness. But we strive incessantly to expedite the journey.

Thus, as has already been observed, propositions, after having been distinctly thought, are made to yield complex terms, which supply their place: "This man is amiable," is substantially preserved in the form, "This amiable man." Such abbreviation gives, among other products, the means of substituting, for the cumbersome form of hypothetical reasoning, the simpler form of reasoning categorically. In the meantime, dealing with the latter species of thinking, we have to note the fact, that mediate inference brings the abbreviative tendency to light in another shape. In a large majority of actual instances, such inference assumes an appearance which disguises its real character. We have reached the utmost limits of direct abridgment: we strive towards the same end by having recourse to suppression. Not merely when we impart thought, but also very often when we think without communication, we evolve to ourselves, we extricate in explicit judgments and propositions, those steps only of our reasoning which the state of our knowledge causes to need explication.

We suppress one of the two premises of a syllogism: often we throw the whole of it into one complex assertion: "The X's are Y's, therefore they are Z's"; or, "The X's, being Y's, are Z's." A syllogism expressed thus incompletely is technically called an *enthymeme*.¹

The state of things may be best observed through the First Figure. This figure, when considered as to its matter, is a process in which a given principle or law, the compass of which is known, is applied to a given case, or cases. The major premise asserts that certain cases M are governed by the law P; the minor premise asserts that the given case S is one of those certain cases M; the conclusion asserts that the given case S is governed by the law P.

Now, in solitary thinking, it can happen but seldom,—in the transference of thought from mind to mind it will not happen very often,—that both of the antecedent truths shall demand to be explicitly brought up to the surface. In most instances, the premise which we wish to present clearly, to ourselves or to others, is the minor, asserting the identity of the given case S with one of the cases M. We follow this assertion immediately, by inferring that the case S is governed by the law P. The implied assertion of the major premise, that all the cases M are governed by the law P, may safely be left unexplicated if two conditions concur: first, that it shall be undeniable; secondly, that it shall necessarily be suggested by the two express assertions. The suppression of the minor premise may have place when our position is reversed. But that of the major is by far the more common: we leave the compass of the law unexpressed; we affirm only the inclusion of the given case in that compass.

¹ This is the scholastic meaning of the word: but, as Hamilton has shown, it had, in its Aristotelic acceptation, no reference to form. Aristotle's *enthymeme* was an inference in matter necessary; his *enthymeme* was an inference in matter probable. (See also Bachmann, p. 260.)

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97. The necessity of the suppressed premise, as one of the steps in mediate inference, is demonstrable indirectly, through the supposition of its being either supplied wrongly or denied.

The logical necessity of explicating suppressed premises.

Let the terms be symbols of indeterminate meaning: "All Y's are X's; therefore all Y's are Z's." Evidently there is here an argument, on the validity of which a person unfamiliar with logical analysis might be puzzled to decide. Every one would perceive that some assertion is implied: many might supply the deficiency wrongly. "All Z's are X's" might suggest itself to some, and would vitiate the argument. The right premise wanted, the major, is, "All X's are Z's." Let that premise be denied, and any one would pronounce the reasoning inconclusive.

When the terms are determinately significant, our previous knowledge, and our practice in reasoning, concur to make it very unlikely that we shall catch up a wrong premise instead of the missing one. But we shall always discover the necessity for supplying something. "This theory is a novelty in science; therefore it is dangerous." The required major is the assertion, that "All scientific novelties are dangerous." Those who admit this major must admit the conclusion: those who deny it are entitled to assert that the conclusion is unproved. "All Mr M.'s opinions deserve great deference: therefore the opinion that we can infer from one premise deserves great deference." Palpably, there is here implied a minor premise, asserting that the opinion inferred of is an opinion of Mr M.'s. It being admitted, the reasoning is good: if it be denied, the reasoning goes for nothing.

To the argument thus raised, no sufficient answer has been given, by any of those who have maintained the inessentiality of the suppressed premise. They have not been able to show how we could dispense with the *major* premise. Its suppression indicates, only, that the compass of the law which founds the argument is supposed to be so evident, and so directly suggested, as to make the statement of it unnecessary.¹

Supposed suppression of the minor syllogistic premise.

98. With the suppression, much less usual, of the *minor* premise, the objectors have dealt less closely. But one argument referable to this premise brings out a distinction, which disposes of many very plausible instances urged as difficulties.

"A naturalist finds the remains of a horned quadruped, and pronounces that it was a ruminant animal. The reasoning here, if considered as class-reasoning, is perfectly expressed by a single premise with the conclusion. All

horned quadrupeds are ruminant; therefore this horned quadruped was ruminant. A logician may say, 'Yes; but you here comprise in the conclusion two facts or propositions; and when these are separated, you obtain a regular syllogism. All horned quadrupeds are ruminant; this quadruped had horns: therefore it was ruminant.' The introduction of a separate proposition, nevertheless, is obviously forced; it adds no strength to the inference, and represents no separate mental operation."¹

The introduction of it would, at all events, be in many cases quite needless. Not a few of the stereotyped logical examples are in the same predicament with this, of seeking to expand into a syllogism an inference which may be regarded as not really syllogistic,—as being, not mediate, but really immediate. It has appeared already that a syllogism in the first figure is a process of double subalternation. When we can safely infer from the subalternant directly to a subalternate, we always do so; but, if we cannot, we may still be able to infer, from the subalternant, through a proximate subalternate, to the still lower subalternate in which we are interested. In the former case, we have an Immediate inference; in the latter, we have an Inference Mediate or Syllogistic. In which of the two forms we shall either think or speak, is a question which we decide by considering the circumstances in which we are, or suppose ourselves to be. In the first form of the example quoted, the subalternate term, "this horned quadruped," expresses a complex idea, which is supposed to have been antecedently extricated from the proposition, "This animal is a horned quadruped." It is assumed, in short (as in an instance so simple it safely may be), that the fact of the animal being a horned quadruped is not worth explication into a proposition; and, on this assumption, our inference is immediate. But, if we were anxious to invite to that fact the attention either of ourselves or of others, we should require to explicate it: and the inference would become mediate. The minor premise would certainly, in this alternative, be expressed; and, further, if the compass of the law were doubtful (if, for example, we addressed ourselves to persons unfamiliar with zoology), the major premise would have to be expressed also.

In a word, arguments, where the minor premise seems to be suppressed, are really, in a majority of instances, as in this, cases of simple subalternation. There is no spell in the triplicity of the syllogism; and an inference not requiring expansion into the syllogistic shape, should never be violently stretched into it.

99. In every argument, then, which is actually thought to be a mediate inference, two premises are necessary as the Antecedent; although, not in communication only, but also in uncommunicated thought, one of the two may be unevolved when the argument first presents itself, and may remain unevolved unless a call arises for analysis. The accusation made against the syllogism, of representing, as embraced in mediate inference, more steps than those which it really contains, cannot be entertained.

The alternative charge, that the conclusion of a syllogism is virtually implied in its two premises together, is true; and the admission will be estimated very lightly, by those who have a just insight into the close limitations which shut in human reasoning on all sides.² Every original or primitive truth is individual, and is gained, not by reasoning, but by observation of our own thoughts or of the world around us.

¹ There is felt, it must be confessed, a difficulty, seemingly insurmountable, in seeing how Mr Mill's acute and instructive theory of the syllogism affects the major premise farther than by throwing it a step out of the way, while requiring also its being brought back, when required, for the thorough testing of the argument. "All inference is from particulars to particulars: general propositions are merely registers of such inferences already made, and short formulæ for making more. The major premise of a syllogism, consequently, is a formula of this description; and the conclusion is not an inference drawn from the formula, but an inference drawn according to the formula; the real logical antecedent or premises being the particular facts from which the general proposition was collected by induction. These facts, and the individual instances which supplied them, may have been forgotten; but a record remains, not indeed descriptive of the facts themselves, but showing how those cases may be distinguished, respecting which the facts, when known, were considered to warrant a given inference. According to the indications of this record we draw our conclusion, which is, to all intents and purposes, a conclusion from the forgotten facts. For this it is essential that we should read the record correctly; and the rules of the syllogism are a set of precautions to ensure our doing so." (*System of Logic*, book ii, chap. 3, sect. 4.) That the universal proposition, which is the major premise of the first figure, must, if it is a derivative truth (not otherwise), have been gained through antecedent induction, is a truth which cannot be too pressingly insisted on.

² Bailey, *Theory of Reasoning* (1851), page 81; a treatise whose objections to the received theory of the syllogism imply several very valuable suggestions.

³ "The general principle of the syllogism is formal identity; that is, identity between the antecedent and the consequent. One of the premises must contain the conclusion: the other must declare that the conclusion is there contained." (Galluppi, *Lezioni di Logica e Metafisica*, ed. 1854, i. 306.)

The function of the syllogism considered generally.

Doctrine of Inference. Even one such truth cannot be generalized, that is, it cannot be asserted to be a truth in more instances than one, unless through processes which are derivative thinking of one kind or another,—processes which must be inferences, either directly from one judgment to another, or indirectly from one judgment to another, through a third. The necessity of the truth revealed in a presentative cognition finds its normal expression in “this must.” It is not till we have reflectively thought out the possibilities of generalization, that the same truth is expressible as necessary through “all are.” Still more evidently is it impossible that, otherwise than through inference, such generalized truths can be brought to bear on cases, their application to which had not been directly observed.

Knowledge is digested through the two processes thus described: the ascent from this and that observed object to the generalized law of the class; the descent from the law to objects known only as included in the class. The processes are Induction and Deduction. Both are merely the disentanglement of relations given in complication, the distribution of known facts in masses as exponents of discovered laws. They yield systems in which our knowledge is symmetrically arranged, by induction according to the principle which rules its development into a whole, by deduction according to the principle which guides the determination of its several parts. That, by neither method of procedure, can any truth be discovered which is really different from the truths that lay at the root, is a fact which, while it springs necessarily from the limited character of human thought, does still leave to both methods their inestimable value. Between unreasoned knowledge, and knowledge systematically reasoned, there lies the world-wide distance between confusion and distinctness, between thick mist and brilliant sunshine, between the inert lifelessness of chaos and the rejoicing animation of the peopled earth.

On the operations which thus bring light out of darkness, logical laws merely keep a watch. They are guide-posts marking the track, topographical maps signalizing the points of the journey where thought is in danger of going astray. They are nothing more. Those laws of logical analysis, which require the throwing of the results of the operations into certain shapes, are only the alphabet through which we must read the inscriptions by the way-side, the key to the cypher which notes the facts discovered by the local survey.

This is the function discharged by all laws of Inference, from those of the simplest to those of the most complex kinds. It is emphatically the function of the laws ruling the Categorical Syllogism, a process which is the central point of all derivative thinking, rising above and passing beyond immediate inference on the one side, and standing on the other as the basis of all those more complex reasonings which take the more difficult syllogistic forms.

any exception, because of an occasion presenting some Doctrine of fact or facts, whose subjection or non-subjection to a inference. known law is not immediately obvious. We know the law; and we know its compass: there is thus matter for a major premise: all facts of a certain kind are either covered by the law, or are beyond the sphere of its operation. We know, likewise, that the fact about which we wish to reason is one of the facts which thus stand within or without the domain of the law; and this knowledge supplies a minor premise. Our data having thus been placed in exact relations to each other, there follows, inevitably, the judgment, that the narrower fact is subject or not subject to the law. The inference has been set in a form making it both clear and readily testable: and this formal setting forth of it has been made possible, by our having already arranged the three terms in a scale of ordination.

Perfect as a form of inference, the first figure is, just because of the regular sequence of gradation which it assumes, less likely to occur in ordinary thinking, whether with or without expression of both premises, than either of the other figures. In many actual cases, if not in most, the consequent is attainable through an immediate subalternation. Its uses are scientific oftener than popular. It is invaluable as exhibiting the principle on which mediate inference must ultimately rest; and as thus being, directly or indirectly, the most decisive instrument for testing the validity of arguments that are either disputed or not distinctly wrought out.¹

101. The Second Figure expresses a knowledge deficient by one step only, but that a step so important as seriously to cripple the inference. The special functions of the second figure.

The thinking which it expresses is indistinct, in the wider of the two judgments which supply the premises. In the *major* premise, as it has been shown, we turn aside from the route of deduction. We do not directly think the compass of the law, either positively or negatively: we do not explicitly place our intermediate cases either within the law or out of it. We start from the thought of the law itself and predicate of it that it lies out of all the intermediate cases. Doubtless, this assertion implies that the cases are out of the operation of the law; but it does not clearly express the thought of this second assertion. The difference of form or expression is symptomatic of a real difference in thinking: the source of the difference lies in our not having systematically ordinated the thoughts denoted by the three terms; and we suffer for the shortcoming, by being tied down to a negative major premise. The inclusion of our given narrowest case among the intermediate cases, yields a minor premise; but the exclusion of that case from the law is the only consequent attainable.

If, however, a negative conclusion only is aimed at, this figure is equally available with the first; and, when the

The special functions of the first figure.

100. The specific uses of the Syllogism vary with the several figures. Enough has been seen already to show that none of the first three, which only deserve scientific recognition, can be without applicability. We gain a bird's-eye prospect of the relation between the syllogistic figures, in the course of that coasting voyage which we pursue under the pilotage of the scholastic rules; but the system of stratification, which contains the wealth of the gold-region, lies concealed, until, having mastered the doctrine of the Wholes of Predication, we travel into the heart of the country, to survey it as mining engineers.

The First Figure is the characteristic expression of knowledge already systematized, of *deduction* from principles accepted as ruling within a certain sphere.

When, for the explication of such knowledge, mediate inference is requisite, it is almost always, if not without

¹ To the first figure is applicable, one might even say exclusively, Mr Mill's description of the function of the syllogism (note to section 97), as being a code of rules for the interpretation of that abbreviated record of knowledge, which is embodied in universal propositions.

The protest of Ramus, against the speculative tendencies of the Aristotelians, guided him and his followers to some instructive views as to the functions of the several syllogistic figures. They declared the third figure to be (oftenest in an enthymematic form), the first and most natural mode of dialectic or discursive thinking. Dividing, as usual, by dichotomy, they placed over against it a class containing the other two figures. But, in that class, the second figure, as having the simpler formal relation between the middle and the extremes, stood before the first. “The figure which Aristotle calls the first, is in the order of nature the last.” This remark is Milton's, whose logical treatise illustrates very ingeniously the Ramist system of dialectics. (Compare Ramus, *Institutiones Dialecticæ*, lib. ii., capp. 10, 11, 12; with Milton, *Artis Logicæ Plenior Institutio*, in his Prose Works by Birch, ii. 545-551.)

Doctrine of major is the suppressed premise, it will be filled up for either figure, according to the greater or less distinctness with which the thinker has classified his knowledge of the matter handled. Where, indeed, the aim is the detection of differences, while positive attributes, as clearly known, are not attended to, our familiar deductions are likely to fall into the second figure rather than into the first. For the law of identity and non-identity, which glimmers out from afar, above all our thinking, as the twin star by which it must always steer, has its most obvious bearing when the middle term has the same function in both premises.

The consideration last hinted at is applicable with peculiar force to the remaining figure, which, as having distinctive uses infinitely wider than the second, must receive much closer attention.

The special functions of the third figure. 102. The practical uses of the Third Figure are both more various, and more firmly marked, than those served by either of the others.

It is distinctively the *exceptive* figure. A law being asserted as universal, the exhibition of any instance (our middle term) in which it is violated, entitles us to deny the universality in our conclusion. Both positively and negatively, also, it is the form by far most natural for *exemplification*: the middle term is set forth as being, in a given class of objects, an instance in which a law is either obeyed or not obeyed; and hence we infer that there are instances in which the law either holds or does not. Further, both exception and example are sufficient, though there be but one instance of the sort. Hence our middle term is often a singular. This figure lends itself easily to the reception of such a middle, while no other will: and even uninstructed thought, guided by a twinkling suspicion of the ultimate laws of thinking, throws such reasonings into a shape in which the third figure is involved. In all applications such as those just described, the argument proceeds safely, and needs little or nothing either of warning or of guidance.

But the fact stands differently in regard to the most important of all the uses to which the figure may be applied; a use, indeed, towards which the others are only the first steps. The third is distinctively the *Inductive Figure*: and its character, as applicable to this purpose, must be looked at with all the closeness which our opportunities permit.

When we reason in the third figure, we start, as in the second, from a knowledge which is, at one point, incompletely systematized. If it now the cloud overhangs the opposite quarter of our horizon.

We possess the law; and we know its compass, either positively or negatively. The major premise asserts, of its two terms, the relation which they would be found to bear if our terms were thought in their just ordination: our intermediate class of cases is governed by the law, or disobeys it. It is in the *minor* premise that the clue of the deductive maze has been lost. We cannot there assert, that the case or cases as to which we desire to infer, or any of them, are included in the intermediate class; we can assert only that the intermediate class, or some part of it, is included among the cases about which we are directly concerned.

Our position is seductively promising. The intermediate class, denoted by our middle term, is pronounced to be, wholly or partly, either identical with both of the classes denoted by our other terms, or identical with the one of the two, and non-identical with the other. But, in the step signified by our minor premise, we have turned aside from the deductive sequence; and the penalty must be paid. Our conclusion is valid only as to a part of the class of cases about which we aimed at inference. We are not secured against disappointment unless, being forewarned of the limitation, we have in the beginning narrowed our sphere to a part of that class. If, not having thus pro-

tected ourselves, we draw an universal conclusion, we have stumbled into an illicit process of the minor term. Doctrine of inference.

The process which has thus been described, from the objective side, is that which bears the name of Induction. Our universal affirmative propositions, those which express the whole compass of laws, and which become available as the major and confining premises for processes of deduction, have, if they are truths derived from others, been antecedently gained, by us or for us, through induction. Further, those inductions, as actually performed, proceed from data no wider than those explained here, and in the formal scrutiny of the third figure. Yet induction takes place, naturally and usually, in forms which, when completely and exactly set forth, fall into the third figure: while, if it be, in certain circumstances, referable directly to the first, its mood is inevitably one of the two which authorize only particular conclusions. Consequently, an incalculably large proportion of the universal affirmatives, from which, in deduction, we travel downwards, have been reached by a method whose prohibitory laws have been disobeyed. Our ordinary inductions, having conclusions universal instead of particular, are logically inconclusive. Some logicians have rightly called them Imperfect Inductions. There is, indeed, a possible process, describable as a Perfect Induction. As deduction is valid only from a whole to any of its parts, from a genus to any of its species; so induction is valid or perfect only from all the parts to the whole, from all the species to the genus. If, being able to assume only that a law governs some of the species, we hence infer that it governs the genus, our induction is imperfect, and our inference fallacious. If, being able to assume that a law governs all the species, we were hence to infer that it governs the genus, our induction would be perfect, and our inference valid.¹ But the data for such a process are never extant when they are most wanted: our common procedure does never, in the most favourable circumstances, supply them completely. All these truths must be resolutely faced.

103. The Third Figure, while it may, doubtless, like the second, be adopted needlessly, is yet the only form which inference can naturally assume when we are bent, not on determining or specifying universal truths already known, but on enlarging our knowledge, by widening our sphere of generalization. In deduction we argue from the subalternant to the subalternate, from a given class to something contained in it. "Because all are, some are:" the inference is good. In the imperfect induction we argue from the subalternate to the subalternant, from something given as contained in a class to the class itself. Our inference is bad, as passing beyond the sphere of our immediate premises: whether we conclude, peremptorily, that, because some are, all are; or only that, because some known objects of the class are, therefore some unexamined objects of it must be also.

It is because of the logical weakness, which thus per-

¹ The Perfect Induction is dealt with by Joannes Major, in one of the passages already quoted from (note 2 to section 39). Derodon exemplifies it by the following syllogism, which is really in AA²A of the third figure: "Ignis, aer, aqua, et terra, sunt corpora; sed ignis, aer, aqua, et terra, sunt omne elementum: ergo omne elementum est corpus." (*Logica Restituta*, 1659, p. 602.)

The following are the two formulæ of perfect induction proposed by Sir William Hamilton in 1833:—

X, Y, Z, are A :	A contains X, Y, Z.
X, Y, Z, are (whole) B :	or, X, Y, Z, constitute B.
∴ B is A.	∴ A contains B.

See his *Discussions*, p. 161; and compare Baynes, *New Analytic*, pp. 71, &c. Consult also Mansel, *Prolegomena Logica*, pp. 207–211; Trendelenburg, *Logische Untersuchungen*, ii., pp. 261–3; Drobnich, *Neue Darstellung*, §§ 140–146. On the objective side, see Whately, *Elements of Logic*, book iv., chap. i., § 1.

Doctrine of inference. vades all ordinary inductions, that arguments from experience, analogy, or example, in questions relating to human character and conduct, are so apt to be delusive, and require to be scrutinized with so much jealousy. It is because of the same weakness, that arguments of the same type, when used as instruments in the construction of scientific systems, are felt to need fencing round by an array of checks and counter-checks. Such an array constitutes the code of laws which is usually called the Philosophy of Induction; a code diversely promulgated by diverse lawgivers, and admittedly susceptible, in all its editions, both of improvement and of enlargement.

Perhaps the simplest view which can be taken, of the design aimed at in the inductive laws, is this. The imperfect induction leads to a conclusion, which, if stated as universal, involves a logical error: it is required to reduce that error to as narrow a limit as possible; and it is an end not only desirable, but in many cases attainable, that the error shall be narrowed to a minimum which is practically inappreciable. If, the conclusion being stated as a universal ("all are" or "all are not"), the attempt is yet made to give warning of its amount, that amount might be indicated, in the predicate, through the degrees of a modal scale, loosely indicable thus: "Perhaps, probably, very probably, probably in a very high degree, probably in the highest degree thinkable below demonstrative certainty." If, on the other hand, it were attempted to intimate the amount of the error through the subject of the conclusion, the notice might be given through a corresponding scale of quantitative symbols: as, "A few, many, very many, almost all, all that there is any reason for believing to exist." The raising of the inductive conclusion to the highest of these degrees, whether of qualitative probability, or of quantitative inclusion, may be said to be the end aimed at through the inductive laws; such laws, for instance, as those which Mr Mill proposes under his four "Methods of Experimental Inquiry," the methods of Agreement, Difference, Residues, and Concomitant Variations.

How are any such laws effectual? And how is truth attainable through a process which, so far as we have yet examined it, appears to leave open the chance of error?

Laws are applicable to the case, truth is attainable through the process, by reason of this fact. The explicative process is and must be, at one stage or another, amplified by an assumption not implied in the data. Further, that which is assumed must be a necessary and universal truth; it must be a truth which thus lies above the universe of experience, but which becomes known to us only through our experience of individual facts, while it is expressible only by reference to the relations under which those facts became objects of cognition. When regarded in its most concrete and complex aspect, the principle is spoken of by such phrases as "The uniformity of nature." Specified from a higher point of view, it yields the assertion that "Every fact or phenomenon is governed by a law or laws:" and, when we look down on it from a station yet more elevated, it resolves itself into the doctrine, that "Like causes produce like effects."

This principle rules human activity quite as sternly as it rules the passivity of corporeal matter. But the laws, the causes, are not the same. Will, indeed, predominates over both regions; that all-directing and sustaining Will, in the thought of which is found the last solution of the problem raised, when we trace law and cause upwards into pre-formed purpose or design. That universal energy, however, being reverently taken for granted, we see that mind exercises volition of its own, that it acts, or exercises its powers, in virtue of will; while body merely obeys the universal laws of its nature, whether left to itself, or influenced, in conformity with these, by the will of man. Hence it is that the generalization of reasonings about mind is, and must always

continue to be, so much more hesitating and precarious than similar generalization about things corporeal. Given a cause, that is, given all the elements of a cause; it must always be possible to prognosticate the effect. But we may know all the causes which immediately influence body: we never do or can know all the causes which immediately influence mind; and this impotence imposes a limit on the certainty, both of a generalized law, and of its application to an individual fact.

Doctrine of inference.

104. Though the fourth figure is certainly useless, it is clear that both the second and the third represent forms of reasoning, which are not only actual but frequent; while the third, likewise, is the natural form of our common generalizations. The uses of syllogistic reduction.

Reduction of syllogisms, then, to the first figure, cannot well be maintained to be necessary on a ground which has been hinted at by one great philosopher, and regularly developed by another.¹ The imperfect moods, it has been said, are really Mixed Inferences: each of them implies one or more immediate inferences by conversion: and it is from these implied premises, not from the expressed ones, that the conclusion is mediately inferred. The substituting of the implied propositions for the expressed ones, is the reduction of the syllogism.

The process of thought supposed by this theory, is not that which actually takes place. When an argument is expressible as a syllogism in a mood of any indirect figure, we have really thought in that figure, not in the first.

But reduction, though it does not show what the given inference really was, does show what it might have been: and herein is its usefulness to be found. We had fallen into the given figure, because, whether through imperfect knowledge or through want of reflection, we had not distinctly thought the three concepts of our reasoning, in the relations which they must bear to each other as members in a classified series. Reduction brings those relations to light, exhibiting the three terms as being, successively, contained, containing and contained, and containing. Now, likewise, there becomes directly applicable to our argument the law of subalternation, the highest concrete principle by which reasoning through common terms admits of being tested.

Accordingly, the transformation of Indirect syllogisms into Direct, should be considered as being only a valuable means of analysing, to the furthest possible point, the elements of a given argument. Every indirect syllogism may, with immediate reference to its conclusion, be held to be a genuine form of thought, resting on a foundation which, though neither the widest nor the deepest of those that underlie it, is yet perfectly strong enough for its support.

Now, therefore, when our study of the simple categorical syllogism is completed, not only may we ask, whether the attempt has been made to propound any laws governing, indifferently, syllogisms of every form; but we may also collect some of those many codes of maxims, in which it has been attempted to draw to a point the functions and formal rules of the several figures.

105. The question as to universal laws of the syllogism reminds us of the two Syllogistic Canons. These, the oldest laws of the sort, were sufficiently examined in a previous section. Specimens of proposed syllogistic canons.

¹ The hint is Aristotle's: *Analytica Priora*, lib. I., cap. 1; *sub finem*. It is developed by Kant, in one of his minor treatises: *Die falsche Spitzfindigkeit der Figuren*. By him, and those who have followed him most closely in the application of his doctrines to logic, such as Kiesewetter, the indirect syllogisms are called Mixed or Hybrid. Schulze calls them syllogisms Extraordinary or Transposed: *Grundsätze der allgemeinen Logik*, ed. 1831, p. 118. Kant's view had been virtually anticipated by the paradoxically acute Derodon: *Logica Restituta*, p. 647.

ceding division of the present chapter. But emphatic commemoration is here deserved by that resolution of the canons into the laws of identity and difference, which was then quoted from Smiglecius.¹ Somewhat later than his time, the same reference was carried yet farther. "For all syllogisms," says Derodon, "whether affirmative or negative, this one principle is sufficient; that things which are the same with a third thing are the same with each other. The principle requires no limitation whatever."²

In the logical systems of the modern Germans, the ultimate dependence of the syllogistic rules on the laws of identity and difference, is generally insisted on, and more or less satisfactorily traced. But we do not encounter, among them, more than a solitary attempt to deduce, for the syllogism, one universal canon, exhibiting the application of the two axioms to the concept. These logicians, however, are very lavish in generalizations of the rules and characteristics of the several figures; and some of the doctrines they have proposed may usefully be cited.

In the First Figure, says Lambert, the middle term is a ground or reason; in the Second it is a difference; in the Third it is an example; in the Fourth it is a ground of reciprocity. "I. The law of the First Figure is the *Dictum de omni et nullo*: What is predicated of all A's, may be predicated of every A. II. The law of the Second Figure is the *Dictum de diverso*: Things which are different, cannot be predicated of each other. III. The law of the Third Figure is the *Dictum de exemplo*: When we find things A which are B's, there are A's which are B's. IV. The law of the Fourth Figure is the *Dictum de reciproco*. (1.) If no M is B, no B is this or that M. (2.) If C is or is not this or that B, there are B's which are or are not C's."

By the same close analyst, the functions of the four figures are otherwise distinguished in this way:—"(1.) The First Figure appropriates to the thing what we know of its attribute. It infers from the genus to the species. (2.) The Second Figure leads to the difference of things, and removes confusion of concepts. (3.) The Third Figure gives examples and exceptions for propositions which appear universal. (4.) The Fourth Figure finds species for the genus, in *Bramantip* and *Dimaris* it shows that the species does not exhaust the genus, in *Fesapo* and *Fresiso*; and it denies the species of that, whereof the genus is denied, in *Camenes*."³ We shall not again find mention of the fourth figure.

Consideration is called for by a generalization wider than this. Herbart distributes the three figures into two classes. The First and Second are called Syllogisms of Subsumption, in respect that in each of them the minor term is subsumed or subordinated under the middle: the Third Figure is said to have Syllogisms of Substitution, their character consisting, it is alleged, in the substitution of one term for another.

One of the most acute thinkers of Herbart's philosophical school, while dissenting in part from the distribution, has expressed the laws of the three figures with pregnant brevity. "The First Figure," says Drobisch, "may be said to reach its conclusion through subsumption, the Second

through opposition, the Third through substitution."⁴ He assigns both a universal law of the syllogism and special laws for the three figures, in the following propositions. In the first of these, M denotes the middle term, A and B the terms of the conclusion; the functions of all these terms, as subject or predicate, being left unfixed.

"A conclusion will always be yielded, when it can be shown, that the whole or a part of the sphere of A, through its relation to the sphere of M, and the relation of M to the sphere of B, is either contained in the sphere of B, or excluded from it.—I. For obtaining syllogisms of the first figure in conformity with this universal principle, the application of the two following laws is sufficient: (1.) In that, wherein the whole is contained, there is contained also its part; (2.) From that, wherefrom the whole is excluded, there is excluded also its part.—II. Syllogisms in the second figure are yielded through application of these two laws: (1.) The part of a whole is excluded from that which is excluded from the whole; (2.) That which is excluded from the whole is also excluded from its part.—III. Syllogisms in the third figure are yielded through application of this law: Identical determinations of a concept may be substituted for each other."

Twisten gives thus the laws of the three figures. "I. In the First Figure, we infer from the genus to that which is under it, by the so-called *Dictum de omni et nullo*. It may be regarded as a widened subalternation. II. In the Second Figure, from the opposite relation of two concepts to a third, we infer to their own opposition. It may be regarded as a widened opposition. III. We may consider the Third Figure as an application of the analytic [explicative] law, that there is given, with a concept, the agreement of its marks. The procedure in it is according to this principle: Concepts which may be predicated of the same subject, may be predicated of each other, though only with limited quantity or modality; concepts, on the contrary, of which the one, but not the other, may be predicated of a certain subject, may be denied of each other, under the same limitation as before."

106. The only other shape of the laws calling for citation, is that in which they have most recently appeared, and in which they are designed to cover, not only the current syllogistic scheme, but likewise all the new moods proposed by their author.

The form in which Sir William Hamilton expresses his one universal canon of the syllogism is this. "What worse relation of subject and predicate subsists between either of two terms and a common third term, with which both are related, and one at least positively so: that relation subsists between those two terms themselves." The same law is given by Mr Thomson, in a form bringing it nearer to being a combination of the two received canons. "The agreement or disagreement of one conception with another, is ascertained by a third conception; inasmuch as this, wholly or by the same part, agrees with both, or with only one, of the conceptions compared."

To the work last quoted from, the author of the universal canon furnished also the following specified applications of it to the several figures:—

¹ Section 82; and its second note.

² *Logica Restituta*, pp. 642, 644. Negative syllogisms he brings under the law of affirmation by contraposition. The absolute identity of the objects denoted by the extremes he maintains chiefly on metaphysical grounds, similar to those urged by Smiglecius: but one section in his argument shows him to have apprehended (not very distinctly) the doctrine, that the quantitative signs are integral parts of the terms.

³ Lambert, *Neues Organon*, 1764, vol. i., pp. 136–143; "Disaioic logie," section iv. Mr Thomson has traced the substance of Lambert's laws, except that for the fourth figure, to Keckermann; and perhaps they are still older. (Thomson, *Laws of Thought*, p. 228; Keckermann, *Systema Logicae [Plenius]*, ed. 1614, lib. iii., capp. 5, 6, 8, 9, pp. 748, 756, 757.)

⁴ Herbart, *Einleitung in die Philosophie*, ed. 1850, p. 111. Drobisch, *Neue Darstellung der Logik*, ed. 1851, sections 81–88. The distinction between Darapti and Felapton on the one side, Datisi and Feriso on the other, was not overlooked by Herbart. But, followed by Drobisch, he uses it by founding on the double distribution of the middle in the first two of those moods, and taking them as the norms of his "substitutive inferences." Surely, however, the character of the third figure is very loosely apprehended when it is said to rest on substitution.

⁵ Twisten, *Die Logik, insbesondere die Analytik*, 1825, §§ 105–109.

Doctrines of inference. *Figure I.*—In as far as two notions are related, either both positively, or the one positively and the other negatively, to a third notion, to which the one is subject and the other predicate; they are related, positively or negatively, to each other as subject and predicate.

Figure II.—In as far as two notions, both subjects, are, either each positively, or the one positively and the other negatively, related to a common predicate-notion; in so far as those notions, positively or negatively, subject and predicate of each other.

Figure III.—In as far as two notions, both predicates, are, either each positively, or the one positively and the other negatively, related to a common subject-notion; in so far as those notions, positively or negatively, subject and predicate of each other.¹

The propositions which have been cited, in this section and the last, may suggest more reflections than one. Each of the codes of laws struggles towards one principle, and is clearly intelligible when that principle is understood and remembered: we are led, everywhere, to look back on the law of non-contradiction, with a beckoning, more or less emphatic, towards the character of concepts as the objects on which the law is brought to bear. Each of the codes, again, is, for those who have mastered the received rules of the syllogism, easily interpretable, as being nothing else than a generalization of them. But, on the other hand, the bolder the generalization is, the more difficult does it become to descend again to the received rules; if, indeed, we have not, at one or two points, been guided completely beyond sight of them.²

CHAPTER IV.

COMPLEX MODES OF INFERENCE.

DIVISION I.—INFERENCE BY COMBINATION OF CATEGORICAL WITH NON-CATEGORICAL PREMISES.

The character of conjunctive propositions.

107. We assert and reason categorically, through assumption of the relations between terms. This is the form which judgment naturally and spontaneously takes when its data are positively assumed; and no long series of judgments deviates steadily from it. That we may be able to adopt it, we continually throw into the shape of complex ideas and terms the judgments which we desire to develop further. To this form, likewise, thought must be reduced, before the primary logical laws can be made to bear directly on it.

But there are propositional forms which are not categorical. Such may be said to be all those with which, under

the name of "Exponible" or "Compound" prepositions, we have already made up a passing acquaintance.¹ These are formally distinguished from categoricals by their complexity: each of them is constituted by two or more propositions that are categorical. Each of them, again, may be analyzed into its constitutive categoricals. Further, most of the kinds of exposables do not become rightly available as data for inference, till that analysis has been performed. The inferences then issuing from such propositions are traceable immediately to the relations of the terms, and consequently are ruled directly by the laws of categoricals.

This limitation of use, however, does not affect all exposables. The exception which has place is indicated by a difference in form. While, in most kinds, certain of the constitutive propositions are only implied, there are two of the kinds in which all the constitutive propositions are explicitly set forth. Propositions of those two kinds may be inferred from, without being subjected to an analysis deep enough to lay bare the implied relations of the terms. In inferring from them, we may content ourselves with assuming a relation, explicated in our complex proposition, between the propositions which constitute it. The peculiar character of the relation so assumed, impresses a peculiar form on the inference for which it becomes a datum.

The two kinds of complex propositions, which are susceptible of being thus dealt with, may have their common character indicated if they are called *Conjunctives*.

A *Conjunctive Proposition* neither affirms nor denies any of the constitutive propositions: it merely asserts a relation between them. It is either an *Hypothetical* (or *Conditional*) proposition, or a *Disjunctive*.²

An *Hypothetical proposition* is constituted by two categoricals; and it asserts that, on the hypothesis or condition that one of the constitutive propositions is true, the other is true also. "If X is Y. (then) Y is Z:" or, "If X is Y,

¹ Note II. to Part III., Chapter I.: *Interpretation of Propositions*.

² The name *Conjunctive*, for the genus, is that of the Port-Royal Logic, as well as of earlier works. There is an awkwardness, obvious and undeniable, in adopting this as a generic name, while the name *disjunctive* is applied to one of the two species. But the fault seems to be less than that of the terminology adopted by Whately, and others, from Aldrich, Sanderson, and most of the older English logicians. These give to the genus the name "hypothetical;" and they designate the two species as "conditional" and "disjunctive." But the words "hypothetical" and "conditional" are palpably synonyms: nor is the name "hypothetical" very apt for disjunctives.

In their treatment of the complex modes of inference, the German logicians, almost to a man, are elaborately and most ingeniously minute; but, alike in nomenclature, in method, and in resulting theory, they are as discordant as the extreme difficulty of the problems would make one expect to find them. Most of them cling, more or less closely, to the remarkably subtle analysis of Lambert. From him, likewise, one or two English writers have taken some of the mnemonic names ("Saccapa, Caspida," &c.), by which, emulating the "Barbara" verses, he sought to symbolize the rules of those complexly-complex inferences, a few of which are touched on in the third division of the present chapter. It is but a very small part of those speculations that can be put to use in the summary here attempted.

Fries's distribution of judgments and propositions (*System*, p. 102), is worth notice for its bearing on complex inferences. Judgments fall, in respect of relation, into three classes. The relation of subject and predicate gives the *Categorical Judgment*; the relation of reason and consequent gives the *Hypothetical*; the relation of co-ordinates to the containing whole gives the *Divisive*. The *divisives*, again, are of two species: the *Conjunctive*, which is the "copulative" of many old logicians; the *Disjunctive*, which is the proposition commonly bearing that name. Copulatives, however, as was already observed, are really categoricals (Note II. to Part III., chap. I.); and, besides, they give but imperfect expression to that divisive relation, which is adequately set forth by disjunctives (compare section 56). The same remarks are applicable to the propositions which Drobisch calls "*Divisive*," as "*B is partly X, partly Y, partly Z.*"

¹ Baynes, *New Analytic*, p. 53. Thomson, *Outline of the Laws of Thought*, pp. 214-230. We have it not now to learn that particularity is a "worse" relation than universality, negation than affirmation. For the full development of Sir W. Hamilton's scheme, however, it has to be remembered, that in extension the subject is "worse" than the predicate, being thought as quantitatively a part of it; that in comprehension, for the same reason, the predicate is "worse" than the subject.

² The following works may be referred to, for other comparisons of the figures:—Melanchthon, *De Dialectica*, lib. iii.; *La Logique* (de Port-Royal), *partie iii.*, chaps. 5, 6, 7; Wolf, *Philosophia Rationalis*, 1728, pp. 311, 317, 320; Wyttenbach, *Procepta Philosophiæ Logicæ*, part iii., chap. 6, § 13; Maass, *Grundriss der Logik*, ed. 1806, p. 222—(the only one of the recent German logicians, so far as we know, that has attempted to generalize the rules of the fourth figure); Hoffbauer, *Anfangsgründe der Logik*, ed. 1810, pp. 164, &c.; Kiesewetter, *Grundriss einer allgemeinen Logik*, ed. 1824, vol. i., pp. (109), 403, 405, &c.; Fries, *System der Logik*, ed. 1837, p. 165; Kidd, *Primary Principles of Reasoning*, 1856, chap. v., sect. 4. For Mr Mill's reading of the law of the first figure, see his *System of Logic*, book ii., chap. 2., §§ 3, 4; and Mr Kidd's observations on the passage in chap. iii., § 1.

Doctrine of inference. (then) Y is not Z." The conditioning proposition is called the Antecedent, the proposition conditioned is the Consequent. The two propositions, accordingly, have functions corresponding, severally, to those discharged by the two terms of a categorical. A function parallel to that of the copula belongs to the "Consequence;" that is, the words "if" and "then," which express the relation between the constitutive propositions. Through these words (or more commonly, in our language, through the former alone), there is denoted the affirmation of the consequent, on condition of the affirmation of the antecedent.

A Disjunctive proposition is constituted by two or more categoricals: it asserts that one or another of these must be true, and the others false. "Either B is X, or B is Y, or B is Z;" or, "Either B is X, or C is X, or D is X." In almost every actual case, one of the terms (simple or complex) is, as in these examples, common to all the constitutive propositions; and, when the fact is so, the disjunctive is conveniently abridged into a form which would make it useable as a categorical having one term alternatively complex. "B is either X, or Y, or Z: Either B, or C, or D, is X." The place of the categorical copula is taken by the "Alternative" words "either" and "or." The import of these is double: they denote the affirmation of one or another of the constitutive propositions, and the denial of all the others. The constitutive propositions, again, represent the categorical terms; but none of them is tied down, as in hypotheticals, to the function of antecedent or consequent. For the character of the disjunctive relation involves an inconsistency, absolutely reciprocal, between any one of them singly, and each and all of the others.¹

Conjunctive propositions as antecedents of inference. 108. When conjunctive propositions are considered as premises or antecedents of inference, three points come to light.

First: The only inferences affected by the conjunctive character are mediate. The conjunctive proposition is one premise: a second proposition must be supplied as the other.

Secondly: A conjunctive proposition of either kind may, with another premise of the same kind, yield a conclusion also of the same kind. But such syllogisms, purely hypothetical or disjunctive, neither evolve, nor depend on, the assumed relations of the constitutive propositions: they are genuine categorical syllogisms, hidden under a disguise, which is thrown over them by the uncertainty of the thinker as to the legitimacy of the assumptions they postulate. The pure hypothetical inference springs from doubt as to the truth of the premises: the pure disjunctive inference springs from doubt as to the extension or comprehension of the terms.

The only syllogisms which do depend on and evolve the relations of the constitutive propositions, are those mixed ones in which the conclusion is categorical. The major premise is, for both kinds, the given conjunctive proposition. But, for both kinds, the minor premise must be categorical. In other words, the conditional or disjunctive relation is evolved, by being brought to bear on an unconditional and positive assertion of fact. In mixed hypothetical syllogisms, the minor premise is categorical, both formally and in substance. In mixed disjunctive syllogisms,

¹ Propositions disjunctive by negation are such as the following: "B is neither X, nor Y, nor Z: Neither B, nor C, nor D, is X." Evidently, however, these fall short, by more features than one, of the character assigned in the text to the disjunctive proper. Indeed, they may rightly be treated as affirmative categoricals, having one term negatively complex: "B—is—something which is neither X, nor Y, nor Z: That which is neither B, nor C, nor D—is—X." The introduction of such a proposition as a premise, when the other premise is categorical, would leave the syllogism directly amenable to the categorical laws.

the minor premise has often the disjunctive form; but it is always in substance categorical, an unqualified assertion of identity or difference between its subject and its predicate.

Thirdly: There appears a point, which, for the theory of these inferences, is the most important of all. The validity of categorical inference, from premises one of which is conjunctive, rests on this postulate: that the conjunctive premise shall be accepted as an affirmation of the result of certain antecedent processes. These processes have, for the two kinds, different characters, and rest on different principles.

(1.) An hypothetical proposition affirms the validity of an antecedent inference. It asserts that, the antecedent being admitted, the consequent must be inferred from it. The necessity of the inference may appear on the face of the hypothetical proposition; but much more frequently it does not. In either case, the proposition merely asserts that the inference is valid, while it presupposes the process by which the validity is established. It thus depends on one or more of the laws of inference, and is traceable through them to the axioms of identity and difference.¹

(2.) A disjunctive proposition affirms the completeness and accuracy of an antecedent process, which either is a logical division, or is ruled by the same principles as it. It asserts that the constitutive propositions set forth all the dividing members of the whole, and that these members exclude each other. It thus depends on the axiom of excluded middle.

This analysis of disjunctives covers all the actual cases. First: None of the constitutive propositions may have any of their terms identical: "Either B is X, or C is Y, or D is Z." Such a proposition is easily referable to a division having a very wide divisum: "All possible cases are cases, either of B being X, or of C being Y, or of D being Z." Secondly: Each of the constitutive propositions repeating one term, the disjunctive proposition may have singular terms only, and will thus assert, alternatively, individual identities only. In this unusual case, the assertion depends, obviously as well as directly, on the law of excluded middle. Thirdly: When its terms are common, one of them occurring in each of the constitutive propositions, the same dependence holds through the law of the concept. In such cases, a disjunctive proposition, in its abridged form, really asserts, of one of its terms (usually, but not necessarily, the subject), that its extension is constituted by the terms constituting the predicate. The predicate is an enumeration of co-ordinate terms, which are parts, and all the parts, of the extension of the subject. The proposition (if held to be a categorical, as it may be), is an A¹; and it affirms, or implies, a logical division carried down to one step only. It is so expressed as to signify, both the mutual exclusion of the parts, and the equivalence of their sum to the whole. Thus, the assertion that "All the B's are either X's, or Y's, or Z's," is interpretable as, or out of, this assertion; that the class B is constituted in extension by the three sub-classes X, Y, and Z. Categorical inference from such a premise is not possible, unless the members of the division are both mutually exclusive, and in their combination exhaustive.

109. From the description of the hypothetical proposition, there come at once the two laws of the Categorical and Hypothetical Syllogism, which is oftenest described simply as Hypothetical. Each governs one of its two moods,—the

The structure and rules of the hypothetical syllogism.

¹ Kant, and many other foreign logicians, place the hypothetical proposition by itself, alleging that it requires, for its justification, the doctrine of the "sufficient reason." But it was maintained, in a preceding note (section 15), that this doctrine, if understood as the assertion of a law purely formal, is resolvable into the axioms of identity and difference.

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Constructive or Positive mood, and the Destructive or Amotive.¹

(1.) The Mood of Position rests directly on the principle of inference: if the antecedent is admitted, the consequent may be inferred. The minor premise, therefore, is an affirmation of the antecedent, the conclusion an affirmation of the consequent. "If X is Y, Y is Z; but X is Y: therefore Y is Z." "If every X is Y, no X is Z; but every X is Y: therefore no X is Z."

(2.) The Mood of Amotion rests on an immediate corollary of the principle, the same which is used for indirect demonstration. The inference expressed in the major premise being assumed to be valid, its consequent cannot be false, unless because its antecedent is so: if the consequent is false, the antecedent must be so likewise. Thus we gain the law of the mood, which is this: If the consequent is denied, there may be inferred the contradictory of the antecedent. The minor premise, therefore, is any proposition expressing an absolute denial of the consequent: the conclusion is any proposition expressing an absolute denial of the antecedent. In applying these rules to common terms, we have to bear in mind the rules of opposition. "If X is Y, X is Z; but X is not Z: therefore X is not Y." "If no X's are Y's, all X's are Z's; but some X's are not Z's: therefore some X's are Y's." "If some X's are Y's, some B's are Z's; but no B's are Z's: therefore no X's are Y's."

(3.) No conclusion can be drawn, with any minor premise, from either of the other two assumptions which are possible; the affirmation of the consequent, the denial of the antecedent. Neither of these assertions would affect the character of the major premise as an inference.

(4.) All hypothetical syllogisms may be reduced to categorical. The positive mood falls directly into the first figure, the amotive mood into the second. Our second example in the first mood might easily be resolved, thus, into *Celarent*: "Any X's which are Y's are not any Z's; but all X's are some X's which are Y's: therefore no X's are any Z's." Often, however, the categorical expression of the major premise becomes extremely unwieldy. In these cases the books, both English and foreign, advise the substitution of such unanalytic forms as those adopted in the following reduction, into *Camestres*, for the last example under the second mood: "All cases in which some X's are Y's, are some cases in which some B's are Z's; the present case is not any case in which some B's are Z's: therefore the present case is not any case in which some X's are Y's."

Analysis of the hypothetical syllogism.

110. Lastly, however, the frequency of such difficulties, in the reduction of hypotheticals, points significantly to inadequacy of the merely formal analysis. Other circumstances strengthen the suspicion.

The two syllogisms last treated exemplify an instructive distinction.

In the former of these, the conjunctive premise is, in effect, an *enthymeme*; and if for it there were substituted the missing premise, our given minor and conclusion would form with it a simple categorical syllogism: "No Y's are Z's; all X's are Y's: therefore no X's are Z's." But this is nothing more than explicating fully the conjunctive premise itself. There is no difference, logically appreciable, between the argument just set down, and this other: "If no Y's are Z's, and if all X's are Y's, no X's are Z's." Indeed, if we take up our ground very firmly, it may become probable to us that the latter form, as enunciating merely the relation of antecedent and consequent, is the precise and proper logical expression of the argument; that the former ex-

presses too much, in respect that it seems to assert the truth of the antecedent, an assertion which does not logically come into question. In truth, as has already been shown, categorical predication and inference rest on presuppositions. In actual thinking, we have, or endeavour to find, positive reasons, justifying the throwing of our thoughts into the categorical form. But logic is indifferent to these reasons: it accepts the assumptions as given; and it traces them to their consequences at the risk of those who give them.

But, again, the last of our examples exhibits another relation. The terms of the conjunctive premise are four; the inference which it alleges must be a complex inference, for the explication of which materials are not given. Some logicians are inclined to refuse to such propositions the character of genuine hypotheticals; but this denial rests on a narrow view of the process.¹ It is quite conceivable that we should make such an assertion as this: "If all good actions are self-rewarding, there are men who are independent of worldly honours;" and, if the relation between the antecedent and the consequent is admitted, we may argue from this premise, either by position or by amotion. But the relation must be admitted, if the argument is to have any force, or even any meaning; and the character of the data makes it impossible for us to verify the relation, unless we amplify our reasoning by assuming premises which are not given, and which have terms wanting also in our data.

In both of our examples, however, presuppositions are absolutely required. The cases differ only in the amount and kind of these. In neither of them is the hypothetical proposition, as given, sufficient to determine the validity of the inference: it must be assisted, for both, by assumptions throwing us back on categorical forms and categorical laws.

All the doubts converge on one question, suggesting an answer that may be challenged as a paradox. Is there, in a categorico-hypothetical syllogism, any actual inference whatever? Is it really any thing more than the statement of a categorical inference, followed by an assertion (involving no inference at all), that there is an actual case on which that inference bears?

111. As, in hypothetical propositions, the validity of the asserted inference must be assumed; so, in Disjunctives, it must be assumed, first, that the alternatives exclude each other; secondly, that the alternatives given are the only alternatives possible. If either of these assumptions is withheld, we are in the same position as we should be placed in by denying the validity of the hypothetical inference. No conclusion could be drawn from the disjunctive, whatever premise might be taken with it.

Categorico-Disjunctive Syllogisms (oftenest called simply Disjunctive) have two moods, which may be named, with explanation, like those which we have from hypotheticals. The mood in which the conclusion is affirmative may be called the Constructive, or the Mood of Position; that in which the conclusion is negative may be called the Destructive, or the Mood of Amotion. But the introduction of negation into the disjunctive premise, through the alternative, creates a contrariety of relation between the minor premise and the conclusion. When the conclusion is affirmative, the minor premise must be negative; when the conclusion is negative, the minor premise must be affirmative.²

¹ See Mansel, *Prolegomena Logica*, pp. 216, 217. Drobisch (p. 51) holds all hypothetical judgments, and also all disjunctives, to be truly synthetic; and his principle lies at the root of the view here taken of both.

² Hence, as it has correctly been observed, the scholastic names of the disjunctive moods, "*Modus ponens*," and "*Modus tollens*," have not the same aptness as in their other application. The first is properly the "*Modus tollendo-ponens*;" the second the "*Modus ponendo-tollens*."

¹ Mood of Position, the "*Modus ponens*, a positione antecedentis ad positionem consequentis;" Mood of Amotion, the "*Modus tollens*, ab amotione, remotione, vel eversione consequentis ad amotionem antecedentis."

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inference.

All alternatives but one being denied in the minor premise, the remaining alternative must be categorically affirmed in the conclusion: all alternatives but one being affirmed in the minor premise, the remaining alternative must be categorically denied in the conclusion. These assertions are, for the two moods, rules governing all cases in which the conclusion can be categorical. If the affirmations or denials of the minor premise were to fall short of exhausting all the alternatives but one, the conclusion must be disjunctive; and the argument would thus be taken out of the class of inferences here in question.

The rules are easily traceable to the law of non-contradiction, in its application to the simplest case that can yield real inference. Let there be given two names of thinkable objects, B and C. There is then possible the disjunctive assertion: "Either B is C, or B is not C." Since B cannot be both C and Not-C, it follows, first, that, if B is not Not-C, it must be C; next, that, if B is C, it is not Not-C. The introduction of a third object would give a positive term, as D, which must be thought as equivalent to Not-C, that is, as being contradictory of C. "B is either C or D: if B is not C, it must be D: if B is C, it cannot be D." When the given alternatives are more than two, the principle must still be strictly adhered to. Any one alternative, or group of alternatives, being affirmed or denied in the minor premise, all the others must be held as together constituting the contradictory of that alternative or group. All the varieties of combination which many alternatives make possible, must be treated in the same way. Thus, let the given major premise be this: "B is either C, or D, or E." For categorical conclusions, we must fix on some one alternative, and exclude from it all the rest. Affirmatively we may conclude "B is neither C nor D; therefore B is E." negatively, "B is either C or D; therefore B is not E."

Analysis
of the dis-
junctive
syllogism.

112. The books do not attempt the reduction of disjunctive syllogisms into categoricals, unless by first reducing them to hypotheticals, through change of the disjunctive premise. The change to be made on it is dictated by the character of the other premise. Thus, for the first example just given, the major premise would pass into the hypothetical proposition, "If B is neither C nor D, it is E:" for the second example, it would take this shape: "If B is either C or D, it is not E."

This reduction, through hypotheticals, not only leads us back towards categorical forms, but likewise exhibits clearly the principle of the reasoning. It exposes, further, the character of the antecedent process through which, when the terms are common terms (the only case deserving minute inspection), the disjunctive proposition has come into existence. Our last proposition of the sort is equivalent to the assertion, that the class B is constituted by the sub-classes C, D, and E; that "all" the objects we call B are contained in three sub-classes, to which, severally and exclusively of each other, we give the names C, D, and E. What, in this view, is the minor premise? More particularly, what is its subject? Its subject is, "Some or certain B's;" or, "the B's we are thinking of." If the premise is affirmative, it is a direct subalternate of the major premise. It affirms that the B's in question are contained in one of the sub-classes, as C; or, alternatively, that they are included either in one or another of them, as C or D. It follows, inevitably, in the conclusion, that the B's in question are excluded from one and all of the sub-classes co-ordinate to those in which those B's have been included. If, again, the minor premise is negative, the conclusion is gained on the same principle. The B's in question, being excluded from certain of the sub-classes, must be included in some one of the others;

tionem:" the second is the "Modus ponendo-tollens; a positionem ad motionem."

and, if they have been excluded from all the sub-classes but one, they must be included in that one.

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inference.

In short, the disjunctive syllogism, like the hypothetical, sets forth, in its major premise, the result of an antecedent process; and it adds to this, in the minor premise, an assertion of fact. The hypothetical sets forth a pre-formed inference; the disjunctive sets forth a pre-formed ordination of terms, issuing in a logical division. But the latter goes further than the former: it does seem to be a real inference. It silently assumes a premise which is formulated in the expression of the law of excluded middle ("B is either C or Not-C, and cannot be both"); or in the rule of predication thence derived, that co-ordinate terms must be denied of each other. Thus, the ordination and division explicated in the major premise being presupposed, our last two examples are analyzable into these categorical forms: (1.) All B's which are neither C's nor D's are E's; certain B's are B's which are neither C's nor D's: therefore certain B's are E's (*Barbara* or *Darii*). (2.) B's which are either C's or D's are not E's; certain B's are B's which are either C's or D's: therefore certain B's are not E's (*Celarent* or *Ferio*).

DIVISION II.—INFERENCE FROM PREMISES INVOLVING ULTRA-SYLOGISTIC SUBSUMPTIONS.

113. The name *Sorites* is given to a complex argument, The structure and rules of the *Sorites* are resolvable, by expression of steps implied, into a series of simple syllogisms, in which the conclusion of each but the last becomes a premise in the next following.¹ It is needless to examine any of its kinds, except that in which all the propositions are categorical.

The *sorites* may take, by two several arrangements of the propositions, either of two forms. The one is the Direct, common, or Aristotelian; the other the Reversed, or Goclenian.² The rules of either are readily gained from those of the other. The first of the two may serve as our model: it is both the more commonly treated, and by much the more natural.

The following argument exemplifies the Direct *Sorites*: "A is M; M is N; N is P; P is Q; Q is B: therefore A is B." The last proposition is the only one presented as a conclusion: all the others appear as premises. The predicate of each premise, except the last, becomes the subject of the next premise: the conclusion has for its subject the subject of the first premise, for its predicate the predicate of the last.

The *sorites* is resolvable into a number of simple syllogisms, less by one than the number of its premises. Thus, our example, having five premises, yields four syllogisms. Of these, again, the *sorites* expresses no conclusion, except that of the very last, which becomes the conclusion of the *sorites* itself: it expresses no minor premise, except that

¹ *Sorites* (from *σώρξ*, a heap), cumulative argument. "Quemadmodum Soriti resistas? quem, si necesse sit, Latino verbo liceat *Acervalem* appellare: sed nihil opus est." (Cicero, *De Divinatione*, lib. ii., cap. 2.) The Germans call it the "chain-syllogism" (*Kettenschluss*). Most of them, also, give the name of "syllogistic-chain" (*Schlusskette*) to a form of argument which requires only a passing notice, that which the old logicians usually called the *Epicheirema*. It is a syllogism in which one or both of the premises are enthymemes; as this: "M is P (because M is C): S is M (because S is D): therefore S is P." The parenthetical assertions evidently exercise no influence on the conclusion: they are given only as reasons for admitting the premises. If a complete explication of the argument were required, we should have to construct two other syllogisms by supplying the missing premises, "C is P" and "D is M." These "prosyllogisms" being set down side by side, there might be placed below them, as "episyllogism," the given syllogism, with its premises freed from their enthymematic supplement.

² From Goclen or Goclenius of Marburg, who, about the end of the sixteenth century, first analyzed it.

Doctrine of the first syllogism, which is the first proposition of the inference. sorites: all the other premises are majors.

The extricated syllogisms of our example are the following; and in these it is observable, that the subject of the conclusion passes on as the subject of each minor premise.

1. M is N; A is M: (∴ A is N.)	2. N is P; (A is N): (∴ A is P.)	3. P is Q; (A is P): (∴ A is Q.)	4. Q is B; (A is Q): ∴ A is B.
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The rules of the sorites are readily deducible from this analysis.

(1.) All the constitutive syllogisms must be in the First Figure.¹ When the conclusion is negative, the second figure is reachable, but only through conversions; and when the conclusion is in A, all the indirect figures are plainly inapplicable.

(2.) Only one Premise can be Particular; and that must be the first of the expressed series. The reason is evident. All the others are major premises; and, in the first figure, the major must be universal.

(3.) Only one Premise can be Negative; and that must be the last of the expressed series. If any other were negative, the suppressed conclusion of its syllogism must be negative. But this conclusion becomes the suppressed minor premise of the next syllogism; and that premise must, in the first figure, be affirmative.

(4.) The Conclusion of the sorites may be an A, when all the premises are A: it may be an I, when the first premise is I, and all the others A: it may be an E, when the last premise is E, and all the others A: it may be an O, when the first premise is I, the last E, and all the others A.

The Reversed Sorites differs from the Direct in the order of the premises only, which is exactly transposed. The same example, so treated, stands thus: "Q is B; P is Q; N is P; M is N; A is M: therefore A is B." Here the subject of each premise but the last becomes the predicate of the next; the conclusion takes its subject from the last premise, its predicate from the first. The premises now expressed are the minors of the constitutive syllogisms, excepting the first premise, which is a major. The only changes which the rules of the common sorites undergo are these; that the premise which may be particular is the last, that which may be negative the first.

The extricated syllogisms are the following. The series is necessarily different from that yielded by the other form; and the predicate of the conclusion does duty as predicate of each major premise.

1. Q is B; P is Q: (∴ P is B.)	2. (P is B); N is P: (∴ N is B.)	3. (N is B); M is N: (∴ M is B.)	4. (M is B); A is M: ∴ A is B.
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Analysis of the categorical sorites.

114. The dissection of the sorites into simple syllogisms is not necessary. If it is accepted as given, the force of the reasoning is quite as evident as the dissection could make it; while the process may still more easily be referred to a higher principle.

Suppose (and the case is supposable, though not more), that, in an argument as complex as that in the example, all the terms are singulars. Each affirmation is then an assertion, that subject and predicate are but two names for one and the same individual object. Quantity not being in question, the quality of the propositions is the only point to be considered. Evidently the rule of the direct sorites holds: negation is admissible only at the last step. If it intruded earlier, the chain of identities would be broken; and any further assertions of identity would have no bearing on those that had preceded.

If the terms are common terms, the same principle is applicable, with this limitation only: that our affirmations are now assertions of inclusion, ("All A's are some M's"); while our negations are assertions of exclusion, ("The Q's are not any B's"). The antecedent of our thinking, the term whose relations are in question, is A, the subject of the conclusion. The common sorites (in this, as in most other points, an apter development of the argument than the other), deals with this term by a regular process of generalization. It begins by asserting the inclusion of A in the class M, that is, its identity with some of the M's: it next includes this class M in the wider class N; N in the wider class P; P in the wider class Q; and Q in the wider class B. Hence follows necessarily the inclusion of A in B, the widest of all the classes, that is, the identity of A with some of the B's.

The affirmative sorites does, in fact, nothing else than explicate, step by step, the affirmations implied in a series of terms positively pre-ordinated in extension thus, from highest to lowest: B, Q, P, N, M, A. Of each subordinate term, its superordinate may be affirmed universally: of the lowest of all the terms, A, the highest, B, may be so affirmed. The syllogisms, evolvable out of the common sorites, trace the A, stage by stage, from lower class to higher. But the case is parallel to that, already observed on, of the supposed suppression of the minor premise in a simple syllogism: the evidence which supports the reasoning is in as little need of the minute explication here as there.

The rules show themselves spontaneously, when the argument is regarded in the aspect just described. If our antecedent is "some A's," then of "some A's" only, throughout the process, can either affirmation or denial take place: the first premise is particular; so must be the conclusion. It is equally manifest that no premise but the first can be particular. The inclusion of a term in a class would avail us nothing, unless we were able, in our next step, to include the whole of that class in the next higher. Again, if negation is introduced at any step before the last, the chain of the positive ordination has snapped. In asserting, for instance, not that "the N's are P's," but that "the N's are not P's," we should pass from the series of terms with which we began, A, M, N, into a new series, P, Q, B, of whose relations to the first series we know nothing. At our last step the crossing of the frontier is safe; because our journey is at an end. Instead of asserting that "the Q's are B's," we might assert that "the Q's are not B's;" whence it would follow that the A's, already identified with some of the Q's, are not B's.

The clue thus furnished would make the scrutiny of the Reversed Sorites very instructive. Its assertions proceed in the order of specification; but they necessarily oscillate. They must do so in order that,—while they began by asserting something of Q, the highest of the subordinate terms,—each lower term in its turn may, through a higher, be directly connected with the superordinate B, till the lowest specification is reached, and A brought into relation with B.

The evolved syllogisms of the two forms bring up curiously, too, the bearings of the two wholes of the concept. The direct sorites is evolved through repeated dealing with A, as an object or objects to be referred to classes till it reaches B. The reversed sorites is evolved through repeated dealing with B, as an attribute to be predicated of object after object, till at last it becomes possible to predicate it of A. The former proceeds in extension, the latter in comprehension.

DIVISION III.—INFERENCE BY COMBINATION OF COMPLEX MODES.

115. The complex forms of predication and reasoning

The mixed sorites and the dilemma.

¹ See, however, as to this question, Lambert, *Neues Organon*, i., p. 188-190; Twisten, *Logik*, pp. 133, 138; Bachmann, *Logik*, p. 254; Drobisch, *Neue Darstellung*, pp. 116-124.

Doctrine of which have now been examined, admit various combinations, inference. which have been, by many logicians, scrutinized with great patience and sagacity. But the theory of them cannot be said to be perfect; and they are certainly curious rather than useful. All of them carry us, by a greater or less distance, still further away from that direct comparison of terms, which, as expressed in categorical propositions, we have had to accept as the normal form of explicative thinking.

It must here suffice to point out, very generally, some of the most prominent among those complexly complicated shapes of reasoning.

I. A Sorites may be constructed with propositions all of which are Hypothetical. Or all its premises may be Hypothetical, except the last: this premise being Categorical, so will be the conclusion.—To the Disjunctive Sorites, almost all logicians have refused admission; and rightly. It is quite possible; but, yielding nothing except a growing congeries of alternatives, it expresses only a deeper and deeper plunging into doubts.

II. The very complex argument, called the Dilemma, has a celebrity which claims for it somewhat closer attention. When expressed so as to bring out all its elements, it is describable as being an Hypothetico-Disjunctive Syllogism. Its major premise is an hypothetical proposition, one of whose constitutive propositions (either antecedent or consequent) is categorical, the other disjunctive. The minor premise is in form disjunctive, and may be either affirmative or negative. (1.) The minor premise may affirm, exhaustively, the disjunctive proposition of the major; and, in this case, the conclusion affirms the categorical proposition of the major. But this inference is valid only when the major premise has its categorical proposition as consequent. (2.) The minor premise may deny, exhaustively, the disjunctive proposition of the major; and in this case the conclusion denies the categorical proposition of the major. This inference is valid only when the major premise has its categorical proposition as antecedent. In short, there are thus two moods, corresponding in character to the constructive and destructive moods in hypotheticals. The argument may be analyzed and tested as an hypothetical.

The following are examples.—1. (*Major*) If either A is B, or E is F, then C is D; (*Minor*) Either A is B, or E is F: (*Conclusion*) Therefore C is D.—2. If A is B, then either C is D, or E is F; but neither C is D, nor E is F: therefore A is not B.¹

¹ Thomson, *Laws of Thought*, p. 267; Fries, *System*, p. 61. The name of Dilemma is by some logicians used more widely than here: by others it is perversely limited to the sophistical arguments spoken of in the next paragraph. The name was most probably applied to this kind of inference, to intimate the compound character of the disjunctive assumption (ἀντίθεσις). The argument was also called by the Latins the “*syllogismus cornutus*,” whence the phrase of “placing one on, or between, the horns of a dilemma.” The word Dilemma supposes two alternatives only: if the alternatives are more than two, the argument is properly a Trilemma or Polylemma. There are three alternatives in the first of the following examples. “A chess-player may argue thus: Whether I move my king, or cover him, or take the piece which has given him check, I must be checkmated at the next move; but I must do one or another of the three things: therefore I must be checkmated at the next move.” (Drobisch, p. 111.) “If man is incapable of

The Greek dialecticians prided themselves on the exhibition of dilemmas which they alleged to be insoluble. These were arguments so framed, that it is necessary to admit both the affirmative minor premise and the negative, and thus to reach both of two contradictory conclusions. All such arguments must, of course, have a fallacy somewhere. Several of the ancient examples are constructed so dexterously, that the detection of the flaw is difficult; but it is always possible, while often there are more flaws than one.—In the first place, the arguments are sometimes not given in the form just described; and, when their propositions are examined, it is found that they cannot be thrown into that form, or into any other that guarantees any conclusion. In such cases, the fallacy is formal, and logically discoverable. Next, if a genuine form is given or attainable, the admission of the conclusion, as a logical consequent of the premises, leaves the argument worthless, unless there have concurred three conditions, all material or extralogical. (1.) The disjunctive proposition of the major must be a genuine disjunctive: its alternatives must be both exclusive and exhaustive. Here, more probably than elsewhere, will be found the weakness of a sophistical dilemma: either it ignores some alternative thinkable under the terms; or it asserts, as mutually exclusive, cases which are reconcilable. (2.) The inference, hypothetically stated in the major, must be valid, either *ex facie* or through extraneous suppositions. (3.) The assertion of fact made in the minor premise must be admitted as true.¹ (W. S.)

improvement, he must be either a divinity or a brute; but man is neither the one nor the other: therefore man is not incapable of improvement.” (Troxler, ii. 103.)

¹ It may be worth while to illustrate, by two of the most famous among the ancient examples, the complications through which it was attempted to veil the weak points of sophistical dilemmas.

The first is known as the “*Syllogismus Crocodilinus*.”—A crocodile, having seized an infant, promises to give it back if the mother will say truly what is to happen to it. She, perhaps rashly, asserts, “You will not give it back.” Thereupon both parties play the sophist. The crocodile argues thus: “If you have spoken truly, I cannot give back the child without contradicting your assertion; if you have spoken falsely, I cannot give it back, because you have not fulfilled the agreement: therefore I cannot give it back, whether you speak truly or falsely.” The mother replies: “If I have spoken truly, you must give back the child in terms of the agreement; if I speak falsely, this can only be because you have given back the child: therefore, in either view, the child must be given back.”

The other example is the “*Sophism of Euathlus*,” which might have been named, quite as fairly, from the other party to the dispute. Neither of them is represented as having been more successful than the crocodile or the mother, in discovering, for the division on which the disjunctive rests, a foundation justly applicable to the facts of the case.—Euathlus had received lessons from Protagoras, the rhetorician, on condition that the fee should be paid if the pupil were successful in the first cause he pleaded. Euathlus delaying to undertake any cause, Protagoras sues him; and this is consequently the young man’s first law-suit. The master argues in this way: “If I am successful in the cause, you must pay me in virtue of the sentence; if I am unsuccessful, you must pay me in fulfilment of the contract.” The pupil retorts: “If I am successful, I am free by the sentence; if I am unsuccessful, I am free by the contract.”

Logrono
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Loire.

LOGRONO, a walled town of Spain, capital of the province of the same name, stands on the right bank of the Ebro, here crossed by a handsome stone bridge, 65 miles E. by N. from Burgos. It is a well-built town, having a number of churches, convents, and hospitals, a Jesuit college, theatre, and orphan asylum. The chief manufactures are leather, hats, soap, and brandy. Pop. 6843.

LOHEIA, a seaport-town of Arabia, Yemen, on the Red Sea, in N. Lat. 15. 42., E. Long. 42. 43. A few of the houses are built of stone, but the majority of them are mere mud huts covered with grass. The harbour is capacious, but is so shallow that vessels cannot approach within some distance of the town. A considerable trade is carried on in coffee, which, however, is of inferior quality to that of Mocha or Hodeida. Pop. about 4000.

LOIR-ET-CHER, a central department of France, formed from a part of the old province of Orléanais, is bounded on the N. by the department of Eure-et-Loir, on the E. by those of Loiret and Cher, on the S. by that of Indre, and on the W. by those of Indre-et-Loire and Sarthe. It is situate between N. Lat. 47. 12. and 48. 8., and between W. Long. 0. 40. and 2. 15., and has an area of 2389 square miles. This department is divided into two nearly equal parts by the Loire, and is named from its affluents the Loir and Cher, which water it in the N. and S. The Cher receives the Sauldre and the Feuzon; the Loire, the Cosson, and the Beuvron. The Loire, the Loir, and the Cher are the only navigable rivers; the first has on its left bank a great number of small lakes and ponds. Blois, its capital, with 17,749 inhabitants, is situate on the line of railway which runs along the N. bank of the Loire, and connects Nantes with Paris. The mineral wealth of this department is neither abundant nor varied. Gun-flints used to be worked here more extensively than in any other part of France, but the recent invention of percussion-locks for fire-arms has ruined this branch of industry. There are some iron mines; also quarries of alabaster, lime, and potter's clay. The principal manufactures are,—woollen and cotton cloths, leather, gloves, native sugar, earthenware, porcelain, glass, and gun-flints. Agriculture is in a very flourishing condition. The country is generally flat, and in the N. it is exceedingly fertile, producing cereals of all kinds, besides hemp, beet-root, and red and white wines. The trade of the department is much facilitated by the Cher Canal: corn, wine, brandy and wool are the principal articles of commerce. It has three arrondissements, subdivided as follows:—

	Cantons.	Communes.	Pop. in 1851.
Blois	10	138	131,817
Romorantin	6	48	50,522
Vendôme	8	110	79,553
Total	24	296	261,892

LOIRE, a department of France, comprising the old province of Forez, with parts of Beaujolais and Lyonnais, is bounded on the N. by the department of Saône-et-Loire, on the E. by those of the Rhône and Isère, on the S. by those of Ardèche and Haute-Loire, and on the W. by those of Puy-de-Dôme and Allier. It is situate between N. Lat. 45. 13. and 46. 17., and E. Long. 3. 40. and 4. 45., and has an area of 1834 square miles. This department, forming the basin of the River Loire, which flows through its centre, is inclosed on the E. and W. by offshoots from the group of the Cevennes Mountains. The highest point in the department is Mont Pilat, 3985 feet above sea-level. A small portion of the S.E. is drained by the Rhone. This river and the Loire are the only navigable ones in the department. A railway runs from Roanne to St Etienne, and thence to Lyons. The coal-fields occupying the high ground on the E. are of great value and extent; they furnish annually a third of the entire coal raised in the kingdom. Mines of lead and iron are also worked. The manu-

Loire.

factures are extensive and important. The principal are silk, cotton, and linen. Machinery and fire-arms are produced in great abundance. The soil, sandy and clayey in Montbrison and Roanne, and granitic in St Etienne, is not in general fertile. Agriculture, accordingly, is not in a very advanced state. The corn and wine are not equal to the local consumption. Horses and cattle are inferior; the sheep are small, with coarse wool, but very agreeable flesh. There are also extensive forests of pine, beech, and oak. The department is divided into three arrondissements, which are subdivided as follows:—

	Cantons.	Communes.	Pop. in 1851.
Saint-Etienne.....	9	74	205,148
Montbrison	9	138	132,116
Roanne.....	10	109	135,324
Total.....	28	321	472,588

The chief town is St Etienne, with a population (1851) of 56,000.

LOIRE (Haute), a department of France, which takes its name from its position on the upper part of the basin of the River Loire. It is formed of part of Languedoc (the old district of Velay, Vivarais, and Gévaudan), with portions of Auvergne and Forez, and is bounded on the N. by the departments of Loire and Puy-de-Dôme, E. by those of Loire and Ardèche, S. by those of Ardèche and Lozère, and W. by that of Cantal. It is situate between N. Lat. 44. 40. and 45. 25., and between E. Long. 3. 4. and 4. 26., and has an area of upwards of 1920 square miles. Lying along the N. slope of the Cevennes, the surface is exceedingly mountainous and irregular. It is traversed by the mountain chains of Velay and Forez, which are for the most part volcanic. The W. of this department is drained by the River Allier; the E. and the centre by the Loire, and its tributaries—the Gazeille, the Lignon, and the Soume on the right; and the Borne, the Arzon, and the Ance on the left. The mineral wealth of the district is not great; yet there are two coal mines in the canton of Auzon of some value, and lead and antimony are also worked. The industrial manufactures are considerable, consisting mainly of lace, ribbons, linen, and woollens. Two-thirds of the population are engaged in this way. There are also tanneries, brick and tile works, and potteries. A considerable number are engaged in felling timber in the forests, which is sawn into planks, and floated down the Allier. Agriculture is in a backward state; the soil is generally barren, the climate severe, and, in the uplands especially, cultivation is almost impossible. Nevertheless, the growth of corn and potatoes is equal to the consumption. Wine, however, is scarce, and of an inferior quality. A great number of horses and mules are reared, and Mezcenc is noted for dairy produce and honey. The principal town is Puy, with a population of 15,723 inhabitants. The department is divided into three arrondissements, which are subdivided as follows:—

	Cantons.	Communes.	Pop. in 1851.
Puy.....	14	111	134,430
Yssengeaux.....	6	39	87,161
Brioude.....	8	106	83,024
Total.....	28	256	304,615

LOIRE-Inférieure, a department of France, situate, as its name indicates, at the embouchure of the River Loire, on the W. coast of that country. It comprises the S.E. extremity of the old province of Bretagne; is bounded on the N. by the department of Ile-et-Vilaine and Morbihan, on the E. by those of Mayenne and Maine-et-Loire, on the S. by that of Vendée, and on the W. by the Atlantic Ocean. It is situate between N. Lat. 46. 53. and 47. 50., and between W. Long. 0. 55. and 2. 32., and has an area of 2595 square miles; is traversed by the Loire from E. to W., and divided by it into two unequal portions, the larger lying

Loire
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Loiret.

to the N. The most important towns of this department—Ancenis, Nantes, and Paimbœuf—are situate upon the Loire, the affluents of which in this department are very numerous; the more important are,—the Erdre, on the right or N. side, which has its embouchure at Nantes; the Sevre-Nantaise and the Achenau on the left. The Achenau is connected with Grandlieu, the largest lake in France, and the N. tributaries drain the numerous small lakes and extensive bogs and marshes of that district. The Vilaine borders on the department on the N.W. There is a canal between Nantes and Brest; and the former town, the capital of the department, is connected with Paris by a railway through Angers, Tours, and Orleans. The minerals are considerable; the principal being salt, iron, coal, granite, and kaolin. Agriculture is in a more flourishing condition here than in any other part of Bretagne. It is rich in grain, especially rye and buckwheat; and common white wine is produced in great abundance. Cattle of the Breton breed are reared in the rich meadows and pasture-lands along the Loire; also horses, swine, and sheep. Here, as elsewhere in Bretagne, great attention is given to the nurture of bees. The commerce, of which Nantes (pop. 96,000) is the centre, is very extensive; the chief articles of which are grain, wine and spirits, timber, fish, and salt. There are five arrondissements in this department, subdivided as follows:—

	Cantons.	Communes.	Pop. in 1851.
Nantes.....	17	71	240,440
Ancenis.....	5	28	48,102
Châteaubriant.....	7	37	71,462
Paimbœuf.....	5	25	46,766
Savenay.....	11	51	128,893
Total.....	45	212	535,664

LOIRE, LA (anc. *Liger*), the longest river in France, rises at the foot of Gerbier des Joncs, among the Cevennes Mountains, in the department of Ardèche, and after a westerly course of 540 miles, falls into the Bay of Biscay. This river drains a district of France nearly equal in extent to one-fourth of the entire kingdom. It becomes navigable at Roanne, and passes the flourishing towns of Orleans, Blois, Tours, Saumur, and Nantes. The navigation is interrupted, however, during four or five months in the year, by frost or floods. To obviate some of the difficulties incidental to the navigation of this river, a lateral canal has been formed along a part of its course, extending from the Canal du Centre to the Canal de Briare. The Loire communicates with the Rhone and Seine by means of canals. The affluents of this river are very numerous and important; many of them navigable. Those on the right are,—the Arroux, the Nièvre, the Maine (formed by the union of the Mayenne and the Sarthe); on the left the Alliet, the Loiret, the Cher, the Indre, the Vienne, the Thoué, and the Sevre-Nantaise. To prevent the Loire from spreading over the low grounds along its course, it has been banked in by dykes, built much above its ordinary level. These embankments were never known to give way previous to the great floods of 1846. They gave way at the same place during the fearful inundations of June 1856, carrying away the bridge and village of Savonnières, and inundating the communes of La Riche-extra and La Chapelle-aux-Naux, causing a dreadful loss of life and property. The mouth of the river is about 7 miles wide, measured from St Nazaire to Paimbœuf. Ships find great difficulty in taking the mouth of the river, owing to the exposed nature of its position, and to the numerous sandbanks which traverse it.

LOIRET, a department of France, formed from the old province of Orléanais (Orléanais proper, Gâtinais, and Sologne), and a small part of Berry. It is bounded on the N. by the departments of Seine-et-Marne and Seine-et-Oise, on the E. by that of Yonne, on the S. by those of Nièvre, Cher, and Loir-et-Cher, and on the W. by those of Loir-et-Cher and Eure-et-Loir; and is situate between the

parallels of N. Lat. 47. 30. and 48. 30., and the meridian of Paris passes through it. It has an area of 2551 square miles. The surface is partly flat, and partly undulating, and is almost destitute of hills, with the exception of a low ridge in the E., forming the watershed of the rivers Seine and Loire. The latter river traverses the department from E. to W., and divides it unequally. It receives as a tributary the Loiret, which gives its name to the department. The other streams are the Loing and the Essonne. The water communication is rendered very complete by the canals of Orleans, Loing, Briare, and the lateral canal of the Loire. The number of small lakes and ponds is very great—nearly 800 in all. The mineral wealth of Loiret is not great, being confined principally to lime, building stone, marl, and potter's clay. Manufactures have made little progress, and have fallen off considerably of late, especially at Orleans. More than half of the department is arable, and remarkably fertile: the N. particularly so, forming part of *the garden of France*. The chief crop is wheat; saffron also is much grown; and wine is abundant. The forests of Orleans and Montargis are extensive. Cattle are very good, and the breed of sheep is improving. Bees are much attended to. There is an important trade in corn, wine, spirits, fruits, fish, honey, saffron, wool, cattle, and timber.

The capital is Orleans, with a population of (in 1851) 47,393. This department is divided into four arrondissements, which, with their subdivisions, are as follows:—

	Cantons.	Communes.	Pop. in 1851.
Orleans.....	14	106	154,600
Gien.....	5	49	49,162
Montargis.....	7	95	76,434
Pithiviers.....	5	98	60,833
Total.....	31	348	341,029

LOJA, a town of Spain, province of Granada, situate in a deep and beautiful valley, through which flows the Genil, here crossed by a Moorish bridge, 25 miles W.S.W. of Granada. The situation is very steep, and the streets are very irregular. The castle stands on a rock in the centre of the town, which, from being the key to Granada, was once a place of great military importance. The town is still in a thriving condition, and carries on manufactures of coarse woollens, silks, paper, and leather. Pop. about 14,000.

LOKEREN, a town of Belgium, province of East Flanders on the right bank of the Drume, and on the Ghent and Antwerp Railway, 12 miles E.N.E. of the former town. The houses are generally large and commodious, and the streets wide and regular; and altogether the town has the appearance of a "large, quiet, Flemish village." The market-place is large and handsome; and among the public buildings are—a spacious church surmounted by a tower, a town-house, prison, and hospital. Its linen fabrics are celebrated, and it has also manufactures of cotton goods, flannels, lace, leather, tobacco, &c. It also carries on an active trade in its manufactures and agricultural produce. Pop. (1851) 16,470.

LOKMAN, a philosopher mentioned in the Koran, is said to have been born about the time of David. One tradition represents him as a descendant of the Arab tribe of Ad, who, on account of his piety and wisdom, was saved when the rest of his family perished by divine wrath. According to another, he was an Ethiopian slave, noted alike for bodily deformity and a gift for composing fables and apologues. This account of Lokman, resembling so closely the traditional history of Æsop, together with many traits common alike to both these fabulists, has led to the prevalent opinion that they were the same individual. The various reports agree in ascribing to Lokman extraordinary longevity. His extant *Fables* bear evident marks of modern alteration, both in their diction and their incidents. They were first published with a Latin translation of the Arabic, by Erpenius (Leyden, 1615). Galland produced a French translation of the *Fables* of Lokman and Bidpai, or Pilpay,

Loja
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Lokman.

Lollards. at Paris in 1724. The latest editions of Lokman are those of Caussin, Paris, 1818; Freytag, Bonn, 1823; and Rödiger, Halle, 1830.

LOLLARDS, THE, a religious sect, made their first appearance about the beginning of the fourteenth century. Among the various opinions touching the origin of their name, the most common is that which traces it to Walter Lollard, who was burnt for heresy at Cologne in 1322. Without doubt, however, he, instead of giving, owed his surname to the sect. The correct opinion is, that the Lollards received their distinctive title from their marked attention to the worship, and especially to the praise of God. From the German word *lullen*, *lollen*, or *lallen*, meaning "to sing in a low tone," they were called *Lullhards*, *Lollhards*, or *Lollards*. Their habit of frequent prayer was the cause of their other title, *Beghards*, derived from *beggen*, to "beg" or "beseech." The term Lollards was often applied to sects known by other appellations, amongst which the most noted were the *Cellites*, or *Alexians*, of Antwerp. These, during the raging of a virulent pestilence, tended the couch of the dying which the priests had forsaken, and accompanied the dead to the grave, chanting as they went their usual mournful melodies. To the same humane duties did the Lollards of both sexes, over the greater part of Germany and the Netherlands, devote their lives, trusting for their livelihood to the benevolence of the pious, and to the gratitude of those whom they relieved. The priesthood, vexed that their indolence had become so apparent by contrast with such active benevolence, keenly persecuted the Lollards, and arraigned them before the pontiffs for many faults and errors. Fastening upon the vices of some mere formalists who had joined the sect, they laid the hollow deceit of a few to the charge of all, and, in the course of time, applied the term Lollard as an epithet of contempt and reproach to all whom they considered hypocritical. The magistrates, however, appreciating the public services of the Lollards, advocated their cause with the pontiffs, and obtained for them a withdrawal from the jurisdiction of the Inquisition to that of the bishops alone. This freedom from molestation was perfected in 1472, when Charles Duke of Burgundy procured a decree from Sixtus IV., absolving the Lollards from the authority of the bishops, and constituting them a religious order. Additional privileges were conferred upon them in 1506 by Julius II. Many of their societies existed in Antwerp, Cologne, and Utrecht; and, according to Trithemius, their number in Germany amounted to 80,000.

The term Lollards, from being fixed as a stigma upon all those who simply disavowed ecclesiastical practice, came to be applied to those also who denied ecclesiastical doctrine. Accordingly, Walter, above mentioned, received his surname of Lollard on account of his rejection of the mass, extreme unction, and penances, and also, it is said, of baptism and repentance. For a similar reason, and not because, as some suppose, they came from Germany, the followers of Wickliffe in England were called Lollards. Their chief heresy was the denial of the Roman Catholic doctrine, that unbaptized infants must necessarily perish; and accordingly when Henry IV. enacted the statute concerning the burning of heretics this tenet was appointed the test for all suspected of Lollardism. Countenanced by many of the nobility, who concealed their envy of the wealth of the priesthood under the mask of zeal for church reform, the Lollards increased in numbers and in confidence. At the beginning of the reign of Henry V. they affixed placards at the different church doors in London, threatening to shake off by force the load of persecution under which they had so long groaned. Following up this menace, they mustered an army of about 20,000 under their leader, Lord Cobham, but were speedily dispersed by the prompt conduct of the king, and were afterwards kept under check by additional

enactments. The Council of Constance, by removing many of the most glaring ecclesiastical abuses, caused a reaction in favour of the church, and thus weakened the strength of the Lollards. Yet this sect, still attracting within their pale all those who longed to lay their hands upon the ecclesiastical patrimony, continued to weather the storms of persecution that at intervals assailed them, and in the reign of Henry VIII. were the first to adopt those reformed doctrines that finally removed all distinction between them and the rest of the nation. Previous to this period, however, it is calculated by Fox that more than 100 of their number were burnt at the stake.

LOLLI, ANTONIO, a celebrated violinist, was born at Bergamo, in the N. of Italy, in 1728, according to some authorities; or in 1733, according to his pupil, Michel Woldemar. He appears to have been a self-taught violinist. About 1760 he travelled in the Netherlands and in Holland, and went thence into Germany. He visited St Petersburg in 1773, and Paris in 1789, where his extraordinary command of the violin excited much attention. He performed in London in 1785, where he was considered as a madman, but soon returned to Italy. After appearing at Berlin, Copenhagen, and Vienna, he visited Palermo in 1793, and Naples in 1796. He died at Palermo in 1802. The conquest of difficulties seems to have been his chief ambition, and he is said to have had no feeling for measure in his playing. Besides his sonatas and concertos, he published a *School for the Violin*, with accompaniments for a second violin, viola, and bass. Lolli, like some other violinists of his time, often altered the tuning of his violin in order to execute certain passages, or to obtain particular effects. Some writers, unacquainted with the compositions of Lolli and other violinists of the last century, have wrongly ascribed to Paganini alone the artifice of altering the tuning of the violin for purposes of effect, or of execution.

(G. F. G.)

LOMBARD, PETER, surnamed *Master of the Sentences*, the son of obscure parents, was born at a village near Novara, in Lombardy, about the beginning of the twelfth century. After receiving his elementary education at Bologna, he removed to France, bearing a recommendation to St Bernard, by whom he was placed at the famous school of Rheims. Attracted to the University of Paris by the eminence of its professors, he became so noted there for his attainments, that he was successively appointed tutor to Philip, the son of Louis le Gros, a professor of theology, and, in 1159, Bishop of Paris. He died in 1164. The chief work of Peter Lombard, and that which gave him his surname, is his *Sententiarum libri quatuor* (Nuremberg 1474), being a collection of sentences or passages from the fathers bearing upon the disputed doctrines in theology. By such a concentrated weight of authority, he attempted to quiet all religious doubts and controversies, and to bind the spirit of free inquiry with the bonds of the church's decisions. A contrary result, however, followed. Failing to reconcile the opposing doctrines, contained in different quotations, the book of *Sentences* readily furnished both matter and occasion for controversies, which its timid and faltering speculation failed to decide. It even expressly started difficulties which it never attempted to settle. Yet this work upholding, both by precept and example, the supreme authority of the church in questions of doctrine, and forming the first complete summary of the theology of the middle ages, was employed in the schools as a manual, and became the text-book of numerous and important commentaries. Its greatest merit, however, consists in its having embodied the intellectual spirit of that age, and laid the foundation of the scholastic philosophy. Some of Peter Lombard's views touching the human nature of Christ have been censured, and sixteen of his articles were condemned by the divines of Paris in 1300.

Lolli
||
Lombard.

Lombards. LOMBARDS, or more correctly LONGOBARDS, a northern nation who settled in Italy in the sixth century, and founded a kingdom, which lasted 206 years, 568-774.

The name of *Longobards* is of doubtful origin, some derive it from *lack*, a word signifying winter, whilst others think that it comes from the two German words *langen harden*, or the long halberds they were supposed to use in war. But Paulus Diaconus, their historian, and himself a Longobard, who lived in the eighth century, tells us that they were called Longobards from the length of their beards, having formerly been called Winili:—“*Certum est Longobardos, ab intactæ ferro barbæ longitudine, cum primitus Winili dicti fuerint, ita postmodum appellatos. Nam juxta illorum linguam, lang longam, baert barbam significat.*” (*De Gestis Longob.* i. 9.) Possibly they may have received this name on their first arriving among the Germanic nations, who wore no beard.

Scanty, and often contradictory, are the earliest records of the Longobards, until they settled on the Danube, in the time of Odoacer. They are supposed to have left Scandinavia at an unknown period, under the conduct of their chiefs, Ibor and Aion, and after attacking and overcoming the Vandals, to have settled in the N. of Germany. Velleius Paterculus, who attributes to them more than German ferocity, states that they were conquered under Augustus by Tiberius Cæsar; and Strabo and Ptolemy mention them as established on the right bank of the Elbe, and forming part of the confederation of the *Suevi*. Tacitus adds, that, being few in number, and surrounded by powerful neighbours, they maintained their independence by constant warfare. Ibor and Aion were succeeded by Agilmund, who is commonly reckoned the first king of the Longobards.

Towards the end of the fifth century they settled on the left bank of the Danube, in the country of the Rugians, who had been almost exterminated by Odoacer. During their stay in this country they rendered themselves formidable to the neighbouring nations, and carried on successful wars with the Heruli. In 526 they were allowed by the Emperor Justinian to settle in Pannonia and Noricum, under their king, Audoin. It was here that the enmity which had long existed between them and the Gepidæ broke out into open war. In a great battle fought in 551, Turismund, the son of the king of the Gepidæ, was slain in single combat by the son of Audoin, Alboin, who shortly after succeeded his father as king of the Longobards. The first act of Alboin was to form an alliance with Baian, the chagan of the Avars, in order jointly to attack the Gepidæ, whose country was to be given up to the Avars. In 566 the two allied nations, from different sides, invaded the country of the Gepidæ, whose king, Cunimund, a brother of Turismund, hastened to meet the Longobards, and give them battle. Alboin slew him with his own hand, defeated his army, and killed so great a number of them, that the Gepidæ ceased from that time to be a nation. He cut off Cunimund's head, and had a cup made of his skull, called, in the language of the Longobards, *scala*, which he made use of in all public entertainments. Having, among other captives, taken the king's daughter, Rosamund, he married her after the death of his former wife, Clotsuinda, the daughter of Clothaire, King of the Franks.

By this victory Alboin gained such reputation, that his friendship was courted by Justinian, on whose application 6000 Longobards were sent to the assistance of Narses against the Goths. The success of the Romans in this expedition, and the subsequent invasion of Italy by the Longobards, have been noticed under the art. ITALY. Alboin was slain in his own palace, through the treachery of his wife, on the 28th June 573, being the fourth year of his reign in Italy. As he was one day feasting at Verona, in the height of his mirth he sent for the queen, and filling

the cup which he had made of Cunimund's skull, he commanded her to drink merrily with her father. Rosamund, struck with horror, hurried out of the room, and, incensed against her husband for thus barbarously triumphing over the misfortunes of her family, resolved to make him pay dear for his inhuman and insulting conduct. She discovered her intention to Helmichild, the king's shield-bearer, who suggested that Peredeus, a youth of great courage and bodily strength, should be called into the conspiracy. Peredeus refused to be in any way accessory to the death of his sovereign, and in this resolution he persisted, until, by a shameful stratagem, he was forced to comply with the queen's wishes. Knowing that he carried on an intrigue with one of her ladies, Rosamund placed herself one night in that lady's bed, and received the youth as if she had been his mistress. Then discovering herself to the deceived lover, she told him that he must now either put the king to death, or be put to death by him. Peredeus, knowing that after what he had done, his safety depended upon the death of the king, engaged at length in the treason. One day, therefore, the queen having lulled Alboin to sleep after dinner, introduced Peredeus into his chamber, who fell upon the king with his dagger. Alboin started up and laid hold of his sword, which he had always by him; but having in vain attempted to draw it, the queen having beforehand fastened it in the scabbard, he defended himself with a footstool till he was at last overpowered and despatched with many wounds. Such is the story related by Paulus Diaconus, who adds that he had himself seen the fatal cup of Cunimund's skull in the hands of King Rachis. Agnellus of Ravenna, however, tells the story somewhat differently, as he does not mention Peredeus, and makes Helmichild the deceived lover and unwilling murderer of Alboin.

Rosamund had promised to Helmichild that, as soon as the king was despatched, she would marry him, and bestow upon him the kingdom of the Longobards. The first part of her promise she immediately fulfilled, but she was so far from being able to bestow the crown upon him, that they were both of them obliged to save themselves by flight. They fled to Longinus, the exarch of Ravenna, taking with them the jewels and treasure of the late king, and were received with great marks of friendship and kindness. But Rosamund had not been long in Ravenna, before the exarch, thinking that a favourable opportunity now offered for making himself king of Italy by her means, declared that it was his intention to marry her, provided, by some means or other, she despatched Helmichild. Rosamund, highly pleased with the proposal, resolved to get rid of the person whom she had only married in order to gratify her revenge. Accordingly, having prepared a strong poison, and mixed it with wine, she gave it to her husband as he came out of the bath and called for drink, according to his custom. Helmichild had not half emptied the cup when, by the sudden and strange sensation which he felt in his bowels, he concluded what it was, and with the sword pointed at the queen's breast, compelled her to drink the rest. They both died in a few hours; and Longinus, laying aside all thoughts of making himself king of Italy, sent Albuinda, the daughter of Alboin by Rosamund, and the king's treasure to Constantinople.

The Longobards then chose Clephis, one of the nobility, as their king. He exercised great cruelty on the conquered Italians; but, after a short reign of eighteen months, both he and his wife were murdered by a servant; and there ensued an interregnum of ten years, during which the country was governed by thirty-six dukes, whose appointment dated from the first days of the invasion of Italy. The dukes now acted as independent sovereigns, and, in order to extend their respective territories, they carried on constant wars with the Greeks and the Franks.

Lombards. and even among themselves. Their government was characterized by great cruelty to the conquered race, whose towns were repeatedly pillaged and burnt. Many of the Roman nobles were put to death to get possession of their wealth, and all the others whose lives were spared were divided among their guests,—*hospites*, as the Longobards insultingly called themselves,—and compelled to pay them one-third of the raw produce of their lands. The Romans at length resolved to avail themselves of the anarchy which the private warfares of the dukes had produced among the Longobards, and, by the aid of the Greeks or the Franks, to try to expel them altogether from the country. Accordingly, Pope Pelagius II. sent a Roman patrician with money to implore succour from Constantinople. The Emperor Mauritius being prevented by his wars with the Arabs and the Persians from attending personally to the application, appointed Smaragdus, a general of great reputation, to replace Longinus at Ravenna, and, at the same time, sent an embassy with a present of 50,000 golden *solidi* to Childebertus, the King of the Franks of Austrasia, requesting him to move against the Longobards. The threatened invasion so alarmed the Longobards, that they re-established the monarchical form of government, and chose Autharis, the son of Clephis, as their king (584–590).

Autharis, considering that the power of the dukes was well established, and that they would not be willing to part with the authority which they had so long enjoyed, allowed them to continue in their government, but obliged them to contribute a moiety of their revenues towards the maintenance and support of his royal dignity. He reserved to himself the supreme dominion and authority, and took an oath from the dukes, that in time of war they would readily assist him to the utmost of their power. Though he could remove them at pleasure, yet he deprived none of them of their dukedoms except in cases of treason, nor gave them to others except when their male issue failed. From an obscure and questionable passage of Paulus Diaconus, it would seem that Autharis also released the Italians from the tribute of one-third of the raw produce of the soil, and caused them instead to give up one-third of their lands to the Longobards, who from that time ceased to be *hospites*, and became settlers in the country. Autharis succeeded in checking theft, murder, and adultery, and was the first Longobard king who embraced Christianity. Most of his subjects followed his example; but, as they were all instructed by Arian bishops, they continued long infected with that heresy, which occasioned great disputes between them and the orthodox bishops of the cities subject to their sway.

Three times did Childebertus descend into Italy in fulfilment of his engagement with the emperor, but he was always repulsed by the young and brave Autharis, who, in his victorious career, is said to have overrun the whole peninsula as far as Reggio, and, planting his halbert in the Sicilian Straits, to have said, that those would be the limits of the Longobard kingdom. The fourth Italian campaign of Childebertus had an origin quite characteristic of the times. He had asked in marriage Theodelinda, a daughter of Garibald, Duke of Bavaria, but afterwards he had changed his mind and refused to marry her. She was then sought and obtained by Autharis, who, in his youthful impatience to see his bride, sent a second embassy, in which he himself went as one of the number. On the embassy being introduced to the presence of the duke, Autharis advanced to the throne and stated that, though not the ambassador, he was the friend of the king, who had trusted him with the delicate commission of giving him a faithful report of the beauty of his bride. Theodelinda being sent for, Autharis, greatly captivated with her charms, after a pause of silent rapture, hailed her as the Queen of the Longobards, and requested that, according to the custom of the nation, she would present a goblet of wine to the

first of her new subjects. The request being granted, Lombards. Theodelinda handed round the goblet. When Autharis' turn arrived, on returning the goblet, he made the fair princess blush by softly pressing her hand, and stealthily bringing it to his lips and forehead. Theodelinda confided to her nurse the indiscreet familiarity of the stranger, and was cheered by the assurance that such boldness could proceed only from the king her husband, who by his beauty and courage appeared worthy of her love. The embassy returned, escorted by Bavarian envoys. No sooner did they reach the Italian frontier than Autharis made himself known to them by raising himself on his horse, darting his battle-axe with incomparable strength and dexterity against a tree, and adding, "Such is the wound that Autharis can inflict." Childebertus, on hearing of the intended marriage, resolved to prevent it, and immediately attacked Bavaria. Theodelinda was obliged to escape for her safety, with her brother Gundobald, to Italy, where she was met near Verona by Autharis, and the marriage celebrated with great solemnity on the 15th May 589. The following year Childebertus invaded Italy with a powerful army; but, after pillaging several towns, and in vain attempting to besiege Pavia, he withdrew without any lasting conquests.

Autharis died the same year, and his youthful widow was allowed to bestow, with her hand, the sceptre of the Longobard kingdom. Her choice fell on Agilulfus, Duke of Turin, 590–615, who concluded a peace with the Franks, reduced several rebellious dukes to obedience, and carried on a successful war with the Greeks. His reign marks an important period in the history of the Longobards and of Italy. Through the influence of Theodelinda, to whom we have several interesting letters from Pope Gregory the Great, he renounced the erroneous tenets of Arius, and joined the Catholic church. His example was eventually followed by his whole nation, whose gradual fusion with the conquered race dates from that time. Many churches had then their property restored; bishops, hitherto persecuted, began to be honoured; numerous monasteries were founded. The palace formerly erected by Theodoric at Monza, near Milan, was restored and enlarged; and adjoining it, the piety of Agilulfus and Theodelinda erected and richly endowed a basilica in honour of St John the Baptist. In this basilica are still preserved three crowns offered by them, one of which, the famous iron crown with which the kings of Italy, and occasionally the emperors, were afterwards crowned, is supposed to be the identical crown placed by Theodelinda on the head of Agilulfus. St Columba, the Irish monk, when he was obliged to escape from Theodoric, King of Burgundy, found a hospitable reception at the court of Pavia, 612 or 613, whence he soon retired to a desert valley of the Apennines, and, under the auspices of Theodelinda, founded the monastery of Bobbio. Both he and his early successors brought together to Bobbio many manuscripts from France and Brittany, which, being scattered among the Vatican, the Ambrosian, and other libraries, at the suppression of that monastery during the late French wars, acquired great celebrity in our times as the *Codices Palimpsesti*, among which Cardinal Mai, then librarian of the Ambrosian, discovered the lost work *De Republica* of Cicero, and other fragments of the ancient writers.

The next two reigns afford nothing remarkable. Adaloald, the son of Agilulfus, who was proclaimed king at the age of twelve, under the regency of Theodelinda (615–625) having gone mad, was dethroned and succeeded by Ariold, Duke of Turin, the husband of his sister Gundeberga (625–636). On a false accusation of infidelity, Ariold threw Gundeberga into prison; but, after having kept her three years in confinement, he consented, at the intercession of her relative, Clotharius, King of the Franks, that her innocence should be tested by a single combat between her accuser and a nobleman who undertook to defend her. The ac-

Lombards. cuser having been slain, she was declared innocent, and released; this was the first instance of a trial by combat in the history of Italy.

On the death of Arioald, Gundeberga was allowed, as it had been previously permitted to her mother Theodelinda, to choose a husband and king. She proposed to Rotharis, Duke of Brescia, who was married, to give up his wife, and take with her hand the Longobard crown. Rotharis (636-652) however, was not more attached to her than he had been to his first wife. Gundeberga was soon shut up in a room of the palace at Pavia, whence she was released after five years at the intercession of the Frank king Clodoveus. Rotharis carried on successful wars with the Greeks of Ravenna, and made himself master of part of their possessions near Venice. He took also and destroyed Genoa, and conquered all the maritime country from the Gulf of Spezia to Nice. But his reign was chiefly remarkable for the introduction of written laws amongst the Longobards, who, before his time, had been governed only by tradition.

He was succeeded by his son Rodoald, who perished after six months by the hand of an assassin, whose wife he had violated. Of the reign of his brother-in-law and successor, Aripertus (652-661), very little is known, except that, at his death, he divided his kingdom between his two sons, Godebertus and Bertharidus, who resided, the former at Pavia, and the latter at Milan. Each brother soon endeavoured to get possession of the whole kingdom. Godebertus applied for support to Grimoald, the powerful Duke of Benevento, who, availing himself of the fraternal dissensions, betook himself to Pavia, where he treacherously slew Godebertus in his own palace, and proclaimed himself King of the Longobards (662-671). Bertharidus fled from Milan, and repaired for safety to the chagan of the Avars.

To give a shadow of right to his usurpation, Grimoald married Godebertus' sister, a granddaughter of Theodelinda, whose memory was still worshipped by the Longobards. He was no sooner seated on his throne, than he was obliged to go to the assistance of Benevento, which had been besieged by the Emperor Constans II., with a large army collected from the various Greek possessions in Southern Italy. After several engagements, Constans was compelled to raise the siege and withdraw to Rome, whence after a few days he departed, carrying with him the brass roof of the Pantheon, and all the ancient bronzes, of which he stripped the old capitol. On his return from Benevento, Grimoald sent an embassy to the chagan of the Avars, asking that Bertharidus should be delivered to him. The chagan refused to give up his guest, but, to avoid a war, expelled him from his country. Bertharidus, aware of the chivalrous disposition of his rival, returned to Italy, and from Lodi, sent his faithful shield-bearer to ask him for hospitality and security. Grimoald generously received him, and assigned him a dwelling and a large pension from the public treasury; but his house was soon frequented by so many noblemen as to excite the suspicion of Grimoald, who was prevailed upon by his courtiers to despatch him. Bertharidus, informed of the plot against his life, sought refuge among the Franks, whom he induced to make a descent into Italy. Grimoald rushed to meet them near Asti, and defeated them (665) by a stratagem. He had encamped himself near the enemy, but suddenly, as if inspired by fear, he raised the camp, leaving behind baggage, food, and a large quantity of wine. The Franks entered and pillaged the deserted camp, and gave themselves up to drinking till past midnight, when they were suddenly fallen upon, and completely routed by Grimoald.

The usurpation of Grimoald was one of the causes of the subsequent anarchy, gradual decay, and final overthrow of the Longobard kingdom. By the great honours and gifts he was obliged to bestow on the dukes who had supported it, he so much raised their power and importance, that, in-

stead of mere delegates of the royal authority, they began Lombards. to consider themselves, and to act as, independent princes; whilst, on the other hand, his success encouraged every one of them to aim at the supreme power. After his death, his son Garibald, a boy, was on the throne a few months, but was easily expelled by Bertharidus, who, on hearing the news of his rival's death, hurried to Italy, and was welcomed by the Longobards as their king. During his long reign (671-688), with the exception of the rebellion of Alachis, Duke of Trent, peace generally prevailed in the country. In 678 he associated with himself on the throne his son Cunibert, whose reign (688-700), after the death of his father, was a constant struggle with the rebellious dukes. One of these, the same Alachis who had revolted against Bertharidus, and been forgiven, was, for a short time, so successful as to drive him from Pavia, and oblige him to take refuge on an island of the Lake of Como, where he fortified himself. But Alachis was finally routed, and slain in a great battle fought near Coronata, and Cunibert remained in the undisputed possession of the kingdom. He left the throne to his son Luitbert, a boy, under the guardianship of Ansprandus, a nobleman of great wisdom and influence; but Ragimbertus, his own cousin, dethroned him, and remained a few months in power. He was succeeded by his son, Aribertus II. (701-712), who seized Luitbert, and had him killed in a bath, and defeating the remnants of his party, compelled Ansprandus to seek safety at the court of Theodebertus, Duke of Bavaria. Ansprandus succeeded, after nine years, in obtaining the support of a Bavarian army, which, swelled by numerous Longobard exiles, enabled him to attack and defeat Aribertus, who was drowned in swimming across the Ticino on his flight to France. Ansprandus survived his victory only three months, and left the throne to his son Luitprand (712-744), who proved by far the greatest of Longobard kings; although his ambition prepared the ruin of the kingdom.

Luitprand was impatient to enlarge his dominions, and for this an opportunity was soon offered by the dissensions which at this time arose between the Greeks and the Romans; the origin of which, however, as well as the events to which they gave rise, are obscurely and differently told by the contemporary chroniclers. The first misunderstanding between Gregory II. and Leo Isauricus, who had ascended the imperial throne in 717, seems to have arisen out of a new tax which the latter imposed on the Italians, and the pope resisted. The emperor, resorting at first to fraud, sent three officers to Rome, with private orders either to despatch the pope, or to convey him prisoner to Constantinople. At the same time, he wrote to Marinus, Duke of Rome, enjoining him to assist his officers in their undertaking. Before they were able to put their design into execution, Marinus died and the whole plot was discovered. Two of the conspirators were apprehended by the Romans and put to death; the third escaped into a monastery, where he took the monastic habit, and ended his days. A new duke was sent from Constantinople, with orders to depose the pope, but he did not even dare to attempt it. Hereupon Paul, the new exarch, who had been sent in 725 to govern Italy, in compliance with the emperor's orders, resolved to proceed no longer by secret plots, but by open force. Accordingly, he drew together a considerable body of troops, and sent them against Rome, with orders to seize the pope and send him in chains to Constantinople. But on this occasion the Duke of Spoleto, and other powerful Longobards, joined the inhabitants of Rome, who, being by this reinforcement far superior in strength and number, met the Greeks near Pons Salaria, and completely routed them.

It was easy to foresee the storm which the news of this defeat would raise at the imperial court against Rome. But a new and more irritating cause came at this time to widen the breach between Greeks and Romans. The Emperor

Lombards. Leo, by his famous edict, forbidding the worship of images, and ordering them to be everywhere pulled down and destroyed, so far incensed his eastern subjects, that, in many places, they openly revolted, and, falling upon the emperor's officers, drove them out of the cities. Leo strictly enjoined his officers in the west, especially the exarch of Ravenna, to see his edict obeyed in their respective governments, and wrote to the pope, promising him his favour if he complied with the edict, and, if he opposed it, declaring him a rebel, and no longer invested with the papal dignity. But Gregory was so far from yielding to the emperor's threats or promises, that, on the contrary, he excommunicated the exarch for attempting to put the edict in execution, and at the same time wrote to the Venetians, to Luitprand, and to the Longobard dukes, exhorting them to continue steadfast in the Catholic faith, and to oppose with all their might such an innovation. Gregory's letters made such an impression on the minds of the people of Italy, that, though of different interests, and often at war with one another, they all united, protesting they would defend the Catholic faith, and the life of the pope, at the expense of their own.

In the meantime, the exarch Paul, having gained a party at Ravenna, began to remove the images out of the churches: a proceeding which incensed the adverse party to such a degree, that, rushing to arms, and falling upon the *Iconoclasts*, or image-breakers, as they styled them, a civil war was raised within the walls of Ravenna. Great numbers were killed on both sides; but those who were for the worship of images having prevailed in the end, a dreadful slaughter was made of the Iconoclasts, and, among the rest, the exarch himself was killed. In Naples, Exhilaratus, duke of that city, in compliance with the imperial orders, did all that lay in his power to persuade the people to receive the edict; but finding his endeavours thwarted by the pope, he hired assassins to murder him. But the plot being discovered, both he and his son were torn to pieces by the Neapolitans, and they shortly after expelled his successor Peter, who had published a libel against the pope.

Leo, hearing of the murder of the exarch, and the general revolt of the cities, and not doubting that the pope was the chief author of so much mischief, sent the eunuch Eutychius to Italy as exarch, strictly enjoining him to have the pope despatched by some means or other. Eutychius went to Naples, and spared no pains to get the pope into his power. He sent a messenger to Rome with an order from the emperor, commanding his officers in that city to put the pope to death without fail. But the messenger being apprehended, and the order found upon him, he was only saved from death by the interposition of the pope himself, who thereupon issued an excommunication against the exarch. Eutychius having brought with him from Constantinople a good number of troops, quelled the rebellion at Ravenna, and severely punished its authors. As for the rebellious Romans, he was well apprised that he could never reduce them, as long as they were supported by the Longobards; and, therefore, he employed all his art and policy to bring Luitprand over to his own interests.

Luitprand, however, far from detaching himself from the Romans, thought that the religious feuds afforded him now a favourable opportunity for extending his dominions at the expense of the Greeks. Having, therefore, drawn together all his forces, he unexpectedly appeared before Ravenna, which he closely besieged. The exarch, who had little expected such a surprise, defended the place with such courage and resolution, that Luitprand, despairing of success, raised the siege, and led his army against Classis, at a small distance from Ravenna, which he took, plundered, and levelled with the ground. The severe treatment which its inhabitants met with from the king, threw the citizens of Ravenna into such consternation, that Luitprand resolved to take advantage of their fear, and returning before the city, by frequent attacks, harassed

the inhabitants to such a degree, that the exarch, finding they could hold out no longer, withdrew privately to Venice. Luitprand, informed of his retreat, attacked the town with more violence than ever, and, having carried it by storm, gave it up to be plundered by his soldiers. The reduction of Ravenna was followed by the surrender of several towns of the exarchate, which Luitprand reduced to a dukedom, appointing Hildebrand, his young nephew, to govern it, and giving him Peredeus, Duke of Vicenza, as his guardian. Among the cities taken by Luitprand at this time, we find Sutri, near Rome, of which the king, at the request of the pope, made a gift to the apostles Peter and Paul: the first instance, often repeated in later years, of restoring to St Peter the cities taken from the empire.

The progress of the Longobards greatly alarmed Gregory II., who, being no less jealous of their power than his predecessors had been, resolved by some means or other to put a stop to their conquests. The only prince in Italy to whom he could have recourse, was Ursus, Duke of Venice. To him, accordingly, he wrote a very pressing letter, conjuring him to assist his worthy son, the exarch, and to attempt with him the recovery of Ravenna. Ursus and the Venetians, moved with the pope's letter, and, at the same time, alarmed at the growth of so powerful a neighbour, promised to assist the exarch with the whole strength of the republic, and fitted out a fleet, pretending that it was designed for the service of the emperor against the Saracens. The exarch, meanwhile, abandoning Venice as it were in despair of bringing Ursus over to his party, raised, in the places still subject to the emperor, what forces he could, and marched with them towards Imola; but turning suddenly towards Ravenna, he laid siege to that city by land, whilst the Venetians invested it by sea. Peredeus defended the town with great courage and resolution; but the Venetians having at length forced open one of the gates on the seaward face, the city was taken, and he himself slain in attempting to drive the enemy from the posts they had seized. Luitprand was then at Pavia; but Ravenna was taken before he could assemble troops to relieve it.

In the meantime, Thrasimund, Duke of Spoleto, who had expelled his father from the dukedom, and forced him to take the habit of a monk, and Romuald, Duke of Benevento, having both revolted, the exarch offered to assist the king with all his means, provided he would in return support him against the pope and the Romans, who had sided with the rebellious dukes. Luitprand readily closed with this proposal, and the two armies joined and marched towards Spoleto. At their approach, the duke, despairing of being able to resist, came out with a small attendance to meet them, and throwing himself at the king's feet, sued for pardon; which Luitprand not only granted, but confirmed him in the dukedom. From Spoleto the two armies marched, in pursuance of the treaty, to Rome, and encamped in the meadows of Nero between the Tiber and the Vatican. Gregory had fortified the city in the best manner he could; but being sensible that the Romans alone could not long hold out against two such armies, taking with him some of the principal inhabitants, he went to wait upon the king in his camp, where he softened Luitprand to such a degree, that throwing himself at his feet, in the presence of the whole army, the king begged pardon for entering into an alliance against him, and assuring him of his protection for the future, he went with them to the church of St Peter, where, disarming himself, he laid his girdle, his sword, and his gauntlet, with his royal mantle, his crown of gold, and cross of silver, on the apostle's sepulchre. After this, he reconciled the pope with the exarch, who was received into the city, where he remained for some time, maintaining a friendly correspondence with the pope.

Gregory did not long survive his success. At his death February 731), his successor, Gregory III., wrote several

Lombards. letters to Leo, soliciting him more pressingly than ever to revoke the edict; and, at the same time, held in the Vatican a council of 93 Italian bishops, who issued an anathema against the *Iconoclasts*. Leo, however, instead of listening to the pope's remonstrances, not only insisted upon his edict being received in Rome, but confiscated all the patrimony which the Roman Church had in Sicily and Calabria. On this the Romans, provoked more than ever against Leo, renounced their allegiance to him, paid him no more tribute, and appointed their own magistrates under the pope, not as their prince but as their head. From these slender beginnings the sovereignty of the popes in Italy took its rise.

At this time Luitprand having fallen dangerously ill, the Longobards chose his nephew, Hildebrand, as his successor; but as the king recovered, Hildebrand remained, in name more than in power, his companion on the throne. Luitprand was soon called upon to put down a new rebellion of the Duke of Spoleto, who was obliged to flee for safety to Rome. Gregory having refused to give him up, the king, before returning to Pavia, took possession of four towns of the Roman territory. Thrasimund, with the aid of the Romans, regained his estates, but did not care to retake and restore to the pope the four towns. Gregory then, finding himself at once betrayed by a faithless ally, and threatened by the warlike and victorious Luitprand, resolved to recur to the protection of the Franks, the only nation capable of coping with the Longobards. They were at this time governed by Charles Martel, who having gained a signal victory over the Saracens in the neighbourhood of Tours (October 732), was generally reputed the best commander of his time. To him, therefore, Gregory sent a solemn embassy, with a great number of relics, earnestly entreating him to take the Romans and the Church under his protection. The ambassadors were received with extraordinary marks of honour, and concluded a treaty by which Charles engaged to march into Italy in person, in defence of the Romans and the Church, if they should be attacked by the Longobards. On the other hand, the Romans were to acknowledge him as their protector, and confer upon him the honour of the consulship, as it had been formerly conferred on Clovis by the Emperor Anastasius, after that prince had defeated the Visigoths.

Luitprand in the mean time marched against Thrasimund, and besieged him at Spoleto; but Gregory did not live to see the fruit of his negotiations. He died in 741, the year in which the Emperor Leo and Charles Martel died, and was succeeded by Zachary, a Greek, who, trusting more to his own means than to the aid of the Franks, gave up the alliance of the faithless duke, and came to terms with Luitprand. Thrasimund, finding all resistance hopeless, surrendered to the king, who compelled him to take the dress of a monk, as he had done to his father. Zachary not only obtained the restoration of the four cities from the king, as well as of a district of the Sabina, which had been seized thirty years before, but in 743 prevailed also upon him to give up his intended attack against Ravenna, and to restore Cesena to the exarch.

At the death of Luitprand, his colleague Hildebrand was left on the throne only seven months, when, being expelled, Rachis, Duke of Friuli, was elected in his place (744-749). During the first years of his reign, Rachis remained at peace with his neighbours, but in the year 749 he invaded the Roman territory, and marched against Perugia. It was whilst he besieged this town, that Zachary, the able and successful negotiator, accompanied by a large number of ecclesiastics and Roman noblemen, went to meet him, and, by vividly painting the punishment that would be hereafter inflicted in the other world on those who violated the rights of the Church, so powerfully operated on his mind, that the king raised the siege, and proceeding to Rome, received from

the pope the tonsure and the habit of a monk, and retired Lombards. to the Benedictine monastery of Monte Cassino. Tasia, his wife, and Ratrude, his daughter, who had accompanied him to Rome, took the habit of nuns, and founded a convent at Piomberuola, in the vicinity of his. Even in our days, the traveller who visits Monte Cassino is shown a spot where the vineyard planted and cultivated by King Rachis is said once to have stood.

Astolphus, his brother, succeeded him on the throne (749-756), and soon showed his warlike and grasping disposition. After making himself master of Ravenna and the *Pentapolis*, as the five allied cities of Rimini, Pesaro, Fano, Sinigaglia, and Ancona, were then called, he marched towards Rome; and, treating it already as a conquered town, demanded a yearly tax of a golden *solidus* from each citizen. Stephen II. who, on the death of Zachary (March 12, 752), had been raised to the papal chair, after vain attempts to appease Astolphus by negotiations, and a fruitless application for aid to Constantine Copronimus, the successor of Leo on the imperial throne, had at last recourse to the assistance of Pepin, the son, and no less wise and powerful successor of Charles Martel. After the preliminary negotiations, whilst a Longobard army was encamped near Rome, Stephen went to Pavia, and having again in vain tried to soften Astolphus, he proceeded to France, and met Pepin at the chateau of Pontyon, on the 6th of June 754. In the spring of the following year, Pepin, accompanied by the pope, crossed the Alps, defeated Astolphus near Susa, and besieging him at Pavia, obliged him to sue for peace. It was granted upon the condition that the exarchate and the towns taken from the Romans should be given up, not to the emperor, but to the pope.

No sooner, however, had Pepin recrossed the Alps than Astolphus, far from fulfilling the terms agreed upon, marched against Rome, laid waste its neighbourhood, and repeatedly stormed the city itself. Stephen had again recourse to Pepin, who descended rapidly by Mount Cenis into Italy, invested Pavia, and, by a vigorous prosecution of the siege, forced Astolphus to add to the restitution of the exarchate and the *Pentapolis*, the surrender of Comacchio. Fulrad, Abbot of St Denis, was despatched to the ceded towns to take hostages, and to receive the keys, which he deposited in the confessional of St Peter's at Rome.

Astolphus died shortly after by a fall from his horse, and Desiderius, Duke of Tuscany, was proclaimed king by the army. Many of the Longobards, however, would not yield him allegiance, and adhered to Rachis, who came out of his monastery with the desire to resume the sceptre. The two rivals were on the point of deciding their contest by arms, when, through the interference of the pope, the monk was prevailed upon to return to Monte Cassino, and Desiderius remained in the undisputed possession of the kingdom (756-774).

At the beginning of his reign, Desiderius tried to establish such a close alliance with the Franks as might further his projects of aggrandizement in Italy, by giving his daughter Ermengarda in marriage to Charles, usually called Charlemagne, the son of Pepin. Pope Stephen III. endeavoured in vain to prevent an alliance which afterwards was to be a source of enmity between the two sovereigns. Charles, in 771, divorced his wife, on the pretext of barrenness, and sent her back to her father, who, in revenge, not only received with hospitality the two sons and the widow of Carleman, but supported their claims to the paternal estates, of which Charlemagne had deprived them. The following year, 772, Desiderius occupied Sinigaglia, Montefeltro, and other Roman towns, and extended his depredations to the gates of Rome. Adrian, who had just been raised to the papal chair, having failed in his efforts to induce the king to leave Rome unmolested, and to restore the places occupied, following the example of his

Lombardy. predecessors, applied at length to Charlemagne. In the autumn of 773, the French monarch marched with a large army across the Mount Cenis to Susa, where he was stopped by the strong line of fortifications, called the *Chiuse d'Italia*, erected by the Longobards. Whilst unsuccessfully endeavouring to force his passage, a deacon from Ravenna, said to have been sent by the pope, showed him a detour, by which he was able to descend into the valley and attack the Longobards on their rear. They, taken by surprise, fled from the enemy with scarcely any resistance. Desiderius sought refuge within the walls of Pavia, and his son Adelchis fled to Verona. The latter place was soon captured, and Adelchis obliged to retire to Constantinople. The defence of Pavia was brave and protracted, but compelled at length by famine and pestilence to surrender (774), Desiderius and his family were made prisoners, and sent to spend the rest of their days in France.

Thus ended the kingdom of the Longobards, who in the course of 206 years had neither been able to complete the conquest of Italy, nor to make the conquered race their friends; had neither preserved their original barbarity, nor adopted the polished manners of the Latin race. It is impossible to know what their language was, though, from those few words that are found with a Latin termination in their laws and in Paulus Diaconus, it may be inferred that it was a dialect of the German, not very different from the ancient Saxon. It would seem, however, that it was never a written language, and that it was soon dropped, even in their national songs, as Paulus Diaconus quotes none of them, though he quotes some in the Saxon and Bavarian languages. Paulus Diaconus, their only national writer, composed his History in Latin after the fall of the monarchy; even their laws were written in Latin, and evidently framed by Latin jurists or clergymen.

It has already been mentioned, that Rotharis was the first king of the Longobards who introduced written laws among them. Grimoald, Luitprand, Rachis, and Astol-

phus, were the other legislators. Their edicts, as they were called, after they had been maturely examined and approved of by the principal lords of the kingdom, were enacted in public assemblies, from which the ecclesiastical order and the people were excluded; so that the legislative power was lodged exclusively in the king and the nobles. These laws, having been respected by Charlemagne, survived for several centuries the fall of the kingdom; and many of them, embodied in the local traditions and statutes of the Italian communes of the middle ages, continued to have their influence till very recent times.

We shall conclude this short historical sketch of the Longobards with the observation, that the two centuries of their power mark the worst period, both for arts and literature, in Italy. The evil genius of destruction was constantly and unsparingly at work. Bad taste, ignorance, and blind superstition, spread all over the country. Even some of the heathen practices, which the Longobards had brought with them from their native forests, when they adopted Christianity, crept into their new religion. Many centuries elapsed before the worshipping of images of vipers, the holding an old walnut-tree as sacred, and such like superstitions, were totally uprooted at Benevento, where Longobard sway lasted the longest. The first glimpses of an improvement and of some learning, though in a monastic form, do not appear till some time after the fall of the Longobard kingdom. Though the later sovereigns, after they had renounced the tenets of Arius, founded many churches and monasteries, yet there are no monuments standing which are supposed to show what really Longobard architecture was in those times; what is sometimes called the *Lombard style*, belongs undoubtedly to a much later period. Of the original Longobard nation scarcely anything remained but their name, preserved in its shortened form of *Lombards*, to the inhabitants of that part of Italy where their principal settlement and the residence of their government had been. (***)

LOMBARDY, OR LOMBARDO-VENETIAN KINGDOM.

THIS beautiful kingdom, comprising one of the richest and most interesting parts of Italy, and forming one of the most valuable provinces of the Austrian Empire, came by degrees and at long intervals into the possession of the House of Austria. The war of the Spanish succession contributed to form its nucleus, and, a century afterwards, the late French wars enlarged it to its present size.

After the battle of Turin, won by the Imperial army under the command of Prince Eugene of Savoy, September 7, 1706, the duchy of Lombardy, which the French occupied in virtue of the Spanish rights, was surrendered to Austria by the treaty of March 13, 1707, between the Emperor Joseph I. and Louis XIV. Thus Spain, after having held it for nearly two centuries, lost it without her concurrence or previous consent to the treaty having been asked. The duchy of Mantua, which its last Duke Ferdinand Gonzaga had allowed the French to occupy during the war, was also given up to Austria by Louis XIV., in order to obtain more favourable terms for himself. After the victories of Napoleon in Italy, these possessions, by the treaty of Campoformio, October 17, 1797, were given up to France, and went to form part of the short-lived Cisalpine republic. Austria received in exchange most of the territories of the Venetian republic, Venice itself included, to which, as a free state, Napoleon had already put an end.

By the final treaty of Vienna of 1815, Austria preserved all the Venetian States; had Lombardy and the duchy of Mantua restored to her; and, to round these possessions, she

received in addition the districts of the Valteline, Bormio, and Chiavenna, formerly part of the Swiss canton of the Grisons, and the Polesine, detached from the papal territory on the left bank of the Po. With the exception of Istria and the other former Venetian possessions beyond the Isonzo, all these states were erected by the treaty into the Lombardo-Venetian kingdom, which is thus a compact territory, bounded on the N. by Switzerland and the Tyrol, on the E. by Illyria and the Adriatic Sea, on the S. by the Papal States and the duchies of Parma and Modena, and on the W. by Piedmont.

A view of the history of the country down to our own times has already been given in this work, under the head of ITALY; and under LOMBARDS will be found a notice of the northern invaders, from whom the name of Lombardy was derived. To avoid repetition, a fuller account of the stirring events from 1846 to 1850 will be given in the article *SARDINIA (Kingdom of)*, with the history of which, during that period, the history of Lombardy is closely connected.

The kingdom extends over an area of nearly 13,208 square miles. Great part of it is a plain, sloping southwards towards the Po and the Adriatic from the main chain of the Alps, which form its northern boundary from the Swiss canton of Lugano to the frontiers of Carinthia. Some of their lower ranges enter the kingdom, and inclose entirely the districts of Valteline, Bormio, and Chiavenna, where their loftiest points are,—the Splügen, 8130; the Legnone, on the Lake of Como, 8120; the Godena, 7549; the Tremezzo,

Lombardy. 5106; and the Corno di Canzo, 4260 feet in height. Some of the mountains on the frontier towards the Tyrol are still higher.

The principal rivers are the Po and the Adige. The former (*Padus, Eridanus*), the largest river in Italy, rises from two springs on the eastern side of Monte Viso, one of the highest summits of the Western Alps, at a height of 6562 feet above the level of the sea, and after a course of more than 380 miles, enters the Adriatic by many mouths. In its progress it receives the waters of numerous tributaries, the principal of which, on its northern side, and within the kingdom, are the Ticino, which takes its rise from several small lakes near the summit of Mount St Gothard, and joins the Po 4 miles below Pavia; and the Adda and the Mincio, the former issuing from the Lake of Como, and the latter from the Lake of Garda. The whole valley of the Po declines towards the E., but in its lower part so gently, that the fall of water in that river, from where it is joined by the Ticino, near Pavia, to its mouth, a direct distance of nearly 180 miles, is not more than about 328 feet. But though languid in its current, in the spring it is generally so much swollen as to cause extensive inundations on both its banks. A more detailed account of this important river will be found under the head Po in this work.

The Adige or Etsch, next to the Po the largest river in Italy, rises in the Rhætian Alps of the German Tyrol, in a small lake near the village of Reschen, and after being increased by the Eisach and other smaller tributaries, it flows by Trent, where it becomes navigable for large boats, and enters the Italian plains above Verona. After a course of more than 200 miles it enters the Adriatic near Chioggia, a few miles N. of the mouth of the Po. The Brenta, the Piave, the Tagliamento and the Isonzo, are all considerable streams, navigable for small boats, and enter the Adriatic N.E. of the Adige.

There are two descriptions of lakes—those of fresh water on the northern frontier at the foot of the Alps, and those of salt water in the flat country on the borders of the Adriatic. The former lakes are of unspeakable advantage, for, never being frozen in winter, they serve the purpose of internal communication, and feed the numerous streams for the irrigation of the lower country. The most remarkable of them, for extent as well as for the picturesque scenery on their banks, are the following:—1st, The Lago Maggiore or di Locarno (*Verbanus*), the most westerly of them. It begins in the Swiss canton of Ticino, and, entering Italy, extends into the boundaries of Lombardy and of Sardinia to Sesto. It is formed by twenty-six brooks, and chiefly by the Ticino, which retains the same name in issuing from the lake till it joins the Po. It is nearly 50 miles long, and varies from 5 to 8 miles in breadth. It is about 640 feet above the level of the sea, and reaches the great depth, according to Jacini, of 2624 feet, or 1984 feet lower than the sea level. In this lake are the BORROMEAN ISLANDS, of which a description has been given in this work. 2d, The Lago di Lugano, which also is partly in the Swiss territory, and is about 24 miles in length, and from 2½ to 6 miles in breadth. It is of great depth, and its surface is 870 feet above the level of the sea. It receives the water of forty-three rivulets, and discharges it partly by the small river Tresa into the Lago Maggiore, and partly by an artificial canal into the small lake of Piano on the E. 3d, The Lago di Como (*Larius*), which is surrounded by lofty, abrupt mountains, that constitute the great romantic beauty of its borders. It has a depth of 1928 feet, is well stocked with fish, and its banks are studded with farms and picturesque villages. Its elevation above the sea is about 650 feet; the length is 27 miles, or 33 if the small Lago di Riva at its northern end be included; and its breadth varies from 1½ to 3½ miles. At Bellagio it divides into two arms, of which the south-western one, ending at

Como, has no outlet; but at the extremity of the south-east-Lombardy. ern arm, near Lecco, it discharges itself by the Adda, which, with 195 smaller streams, has already fed it with water. 4th, The Lago d'Iseo (*Sebinus*), 18 miles long and 5 broad. This lake is 630 feet above the level of the sea, and in some parts has a depth of 985 feet. In its centre there is an island 1½ mile long. It is chiefly supplied by the Borlezza and the Oglio torrents, the latter of which, after passing through the lake, finds the only exit for its waters at Sarnico. 5th, The Lago d'Idro, through which the River Chiese (*Chusius*) passes before it joins the Oglio, is only 7 miles long. 6th, The Lago di Garda, the ancient *Benacus*, the largest and one of the most beautiful of the lakes of Italy. It is nearly 40 miles in length and 10 miles in its greatest breadth. Its surface is 255 feet above the level of the sea, and its greatest ascertained depth is 941 feet. It is chiefly fed by the River Sarta, and the discharge of its waters at Peschiera forms the River Mincio. Being nearly in a straight direction from N.N.E. to S.S.W., the winds from the Alps sweep down it with unbroken violence, and cause most violent storms. It was the subject of the panegyrics of Virgil, of Pliny, and of Catullus, and was rendered celebrated by the victories of Napoleon over Wurmser in the year 1796. 7th, The small lakes of Varese and Pusiano need only be mentioned.

The salt-water lakes and lagoons are formed by the rivers which descend from the Alps, and spread along the shores of the Adriatic; they are defended from the sea by steep artificial walls, not unlike the dykes in Holland, which, in some degree, prevent the influence of the rise and fall of the tides; but in some cases, where the force of the sea has broken through, harbours have been formed. Of such havens, there are four large ones, viz., Malamoco, San Nicolò, Chioggia, and Tre-Porti; and two inconsiderable, viz., Lido Maggiore, and St Erasmo.

There are mineral springs of various degrees of efficacy and reputation for medicinal purposes. The most remarkable of them are at Bormio and Massimo, in the Valteline; at Albano, in the province of Padua; at Caldiero, near Verona; at Recoaro, in the province of Vicenza; at Trescorre and St Pellegrino, in the province of Bergamo; and Cenedo and Piano, in that of Treviso. The climate is mild, except on the border mountains. On the plains the snow scarcely ever remains on the ground, and it is rarely that ice is found in the still lagoons near Venice. What falls from the heavens in winter is much more commonly in the form of rain than of hail or snow. The winter scarcely lasts more than two months; and in February the fields are covered with new grass. In May the hot weather begins, and the harvest is secured in June and July. In September and October the annual labours of the vintage are performed.

The climate, on the whole, is healthy, except in those districts where rice is extensively cultivated, as well as in the vicinity of Mantua, and in the marshy districts extending from the mouth of the Po towards Venice.

The kingdom is divided into two governments or divisions: Venice, which extends from the Isonzo to the Mincio, including all the seashore on the Adriatic to the mouth of the Po: and Milan, which, besides Lombardy proper, includes the former duchy of Mantua, the Grisons districts, &c. Each government is divided into provinces; each province is subdivided into districts; and each district into communes for the administration, and into parishes with regard to ecclesiastical matters. In 1856, with an area of 13,208 square miles, it had 5,503,473 inhabitants, or 416 to the square mile: all of these, with the exception of 7000 Jews, adhering to the Roman Catholic church. Of this population, 2,493,968 belonged to the government of Venice, being, over an area of 6938 square miles, 359 to the mile; whilst the government of Milan, extending over 6270 square miles, had 3,009,505 inhabitants, or 480 to each square

Lombardy mile, the densest population of any European country. In the large towns there are more women than men; but in the small villages the proportion of men is so much greater, that in Lombardy alone there is a surplus male population of nearly 35,000. On an average of sixteen years, there is yearly a marriage in 117, a birth in 23, and a death in 29 inhabitants. Out of 10,000 deaths in Lombardy, 3538 occur, according to Springer, in the first year of life; 1255 occur from 1 to 4; 818 from 4 to 20; 1173 from 20 to 40; 1369 from 40 to 70; 1576 from 70 to 80; 269 from 80 to 100; and 2 beyond 100 years of age. The annexed table shows the divisions into provinces, districts, communes, and parishes, and the respective population of each province:—

Provinces.	Number of			Population in		
	Districts.	Communes.	Parishes.	1838.	1850.	1856.
Government of Milan.						
Milan	14	329	336	522,397	621,455	...
Como	21	525	481	373,216	432,772	...
Bergamo	16	359	448	344,207	385,810	...
Brescia	14	235	312	336,604	359,897	...
Mantua	11	73	184	252,406	269,534	...
Lodi	7	175	160	206,314	222,166	...
Cremona	8	168	174	188,565	208,290	...
Pavia	6	166	144	157,022	173,879	...
Sondrio	5	79	135	90,903	100,157	...
Total	102	2109	2374	2,471,634	2,773,960	3,009,505
Government of Venice.						
Udine	10	182	286	...	436,697	...
Vicenza	10	124	226	...	328,284	...
Padua	8	104	267	...	317,882	...
Verona	11	113	257	...	310,733	...
Treviso	8	104	275	...	298,482	...
Venezia	7	53	163	...	285,330	...
Rovigo	8	65	96	...	176,814	...
Belluno	7	68	109	...	160,582	...
Total	78	813	1679	...	2,314,804	2,493,968
Lombardy ..	102	2109	2374	...	2,773,960	3,009,505
Total	180	2922	4053	...	5,088,764	5,503,473

The whole country is governed by a viceroy, who is always an imperial archduke, resides at Milan, and receives an allowance of L.6000 a-year; his entire expenses, at the same time, being defrayed by the state. Under him are governors of the two divisions of Milan and Venice. There is a military commander-in-chief, who resides at Verona, and who, with the assistance of a military board, has the direction of the army, and of the several fortresses, with their stores and garrisons. Six regiments of infantry, and two of cavalry, were recruited in the kingdom before 1848; but since that time, the conscription has fallen more heavily, and the contingent has varied in each year. In 1856 it was 6977 for the Lombard, and 5829 for the Venetian provinces, or at the rate of $2\frac{1}{2}$ per 1000 of the population. At Verona is also the supreme senate of the kingdom, which hears the final appeals from the courts of Venice and Milan. Since 1848 there has been no viceroy, and all the viceregal powers were till very lately in the hands of Marshal Radetzky, the commander-in-chief. In February 1857 he retired, and the Archduke Maximilian, a brother of the present emperor, was appointed governor-general.

The chiefs or heads of the ecclesiastical body are,—the Patriarch of Venice, who extends his jurisdiction over the archbishopric of Udine and the suffragan bishoprics of Adria, Ceneda, Chioggia, Concordia, Belluno, Padua, Treviso, Verona, Vicenza, and other sees in Istria and Dalmatia; and the Archbishop of Milan, who is the metropolitan of the episcopal sees of Bergamo, Brescia, Como, Crema, Cremona, Lodi, Mantua, and Pavia.

The government is an unlimited monarchy. The law of Lombardy, April 15, 1815, called into existence provincial assemblies (*congregazioni provinciali*) of deputies, selected by the government out of three names given for each deputy by the communes; and created, likewise, central assemblies (*congregazioni centrali*) for the two divisions of Milan and Venice, of representatives named directly by the government. But the functions of these congregations are merely to represent to the sovereign the wishes and wants of the people, and to suggest such measures as may be conducive to the welfare of the country. They do not in any way extend to the voting or altering of the taxes, to the framing of the laws, or even to the prevention or suspension of the operation of such laws as may be promulgated by the central authority at Vienna, or by the local viceroy. The resolutions and observations of the provincial congregations are to be submitted to the central congregations, and, if approved of, transmitted by them to the viceroy or governor-general. They have no means of direct communication with the imperial government at Vienna. According to the law, there is no fixed time for the meeting of these congregations; but the viceroy, or governor-general, after previously obtaining the permission from the aulic council at Vienna, may summon them whenever it is deemed advisable. The central congregations were never summoned till 1845; after the insurrection of 1848, they were, for the first time, recalled into existence in July 1855. Their attributions were defined by an imperial ordinance of November 3, 1856; but they were not assembled till the end of January 1857. The provincial congregations have been summoned oftener; but their suggestions and representations have remained useless for the want of the central congregations, which are their legal organ of communication with the government.

The communal or municipal representation given to Lombardy, by the edict of December 1755, which had been abrogated under the French government, was recalled into existence, and applied to the whole kingdom, in 1816. All landholders, who are neither under age, nor soldiers, nor curates, nor debtors of their respective communes, including the legal representatives of women and minors, meet twice a-year in a general assembly (*convocato*), to discuss the budget of the coming year (the *presuntivo*), and to approve of the expenses of the past year (the *consuntivo*); to appoint teachers, doctors, surgeons, and midwives; to decide upon roads, works of public utility, assistance to the poor, and to vote the taxes required for carrying them out. They also name a triennial committee of three of their members, who, after their nomination has been approved by the government, administer gratuitously the communal property, carry out the resolutions of the *convocato*, make the first investigation about crimes, and have the supposed criminals arrested by the *gendarmes*, &c. Each *convocato* is presided over by a commissary, who ought to confine himself to record the resolutions of the meeting, and prevent their overstepping their attributions, without giving any vote himself, or influencing public opinion in any way. A part of the law scarcely, if at all, attended to of late years. All communes that have more than 300 landholders, to avoid too numerous a meeting, appoint a triennial council of thirty members, to whom all municipal attributions are delegated.

The revenue of the kingdom is derived from direct and indirect taxes, and in some degree from national domains, part of which once belonged to the Church. The most important tax is the territorial impost, an ancient payment, which has been alike collected under the several rulers who have at different times administered the finances of the country. In order to equalize its rate according to the productive powers of the soil, the Emperor Charles VI., in 1718, named a commission to form a *catasto*, or general

Lombardy. registry, in which the extent and value of all lands and buildings that were capable of giving any income, however small, should be duly entered. Its execution was impeded many years by the opposition of privileged classes, and by the war of 1733; but it was resumed in 1749, and finished in 1760, when it came into force. The value of property was set down in *scudi* (about 3s. 7d.), and the assessment was in cents (*centesimi*) of *lire* ($\frac{2}{3}$ ths of 1d.) on each *scudo*. Not many years elapsed, however, before it was found that the valuation in some instances fell short of, and in others exceeded, the real income; and that, therefore, the taxes weighed in a very unequal degree upon different estates. At length, in 1822, with a view to rectify the valuation, and equalize the impost, a new general *cadaster* for the whole kingdom was begun; but the commissioners appointed to do it have proceeded so slowly, that as yet it is completed only for the Venetian, and for a few of the Lombard provinces. The new cadaster registers, not the capital value of property, as in the old one, but the supposed net yearly income in Austrian lire, and rates the corresponding tax in cents of lire.

This tax, which before 1802 was only 11 centesimi (9 for public, and 2 for municipal burdens), had increased in 1847 to about 24, and in 1851 it reached at least 34 centesimi for each *scudo* of valuation. The 11 cents paid at the beginning of the century were then reckoned to represent about 22 per cent of the net income: in the same proportion, the present tax of 34 cents would absorb nearly 70 per cent. of the net income. But the production of the soil has so much increased during these fifty years, that, according to Signor Jacini's account, in his interesting work, lately published, on landed property in Lombardy (*La Proprietà Fondiaria e le Popolazioni Agricole in Lombardia*), those 34 cents represent on an average only 32 per cent. of the net income, though numerous instances occur in which they represent 50, and even 60 per cent. Such is the case with the *marcite*, or winter meadows, the produce of which has scarcely increased from what it was already in the last century; and with lands derived from mortmains, which, in compliance with the spirit prevailing at the time, were greatly overcharged at the original formation of the cadaster. In several districts, however (as the Polesine, part of the provinces of Brescia and Milan, &c.), military rates, local municipal taxes for roads, drainage, &c., are so much higher than those above stated, that taxes of one kind or another are said to absorb from 60 to 70 per cent. of the actual income.

With these exceptions, all public burdens on the landed property in the kingdom, for the present year 1857, may be stated to amount to 36 per cent. of its net revenue, of which nearly 23½ per cent. forms the direct government tax. About 6½ per cent. is for local taxes, collected and employed by the municipal authorities; 2 per cent. for extra taxes, to meet military expenses of 1848 and 1849; and the remaining 4 per cent. is absorbed by the tax on the transfer of property, introduced by the law of February 1850, by the forced loan of the same year, &c. As this impost is collected from the proprietor, it is regularly paid, and attended with little cost in the collection.

The whole produce of the direct government tax on land in 1856 was, in round numbers, for Lombardy, L.950,000, and for the Venetian provinces, L.676,666—total, L.1,626,666; being for Lombardy alone above L.465,006 more than what it was before 1849.

Previous to 1846, the kingdom had to transmit to the imperial treasury at Vienna a net yearly sum of L.1,066,666, in two half-yearly remittances. Neither the gross sum of the revenue at present produced by the kingdom, nor the clear amount that reaches the imperial treasury, are known; but an idea of them may be gathered from the fact, that the gross sum of direct and indirect taxes for the govern-

ment of Lombardy alone, in 1855 and 1856, averaged Lombardy. from L.2,833,333 to L.2,933,333.

By comparing these items with the gross revenue of the Austrian empire, which, in 1855, according to the official returns, was L.26,378,688, of which L.6,074,812 were derived exclusively from the direct land tax, the following interesting results may be gathered. The Lombardo-Venetian kingdom, which is nearly one-fifteenth in area, and little more than one-seventh in population, contributes not much less than one-fourth of the whole direct land tax revenue of the empire; and Lombardy alone, which, compared to the whole Austrian empire, has less than one-thirtieth of its extent, and one-thirteenth of its population, contributes more than one-ninth of the whole gross revenue of the empire. The results will be equally remarkable if their respective agricultural wealth is compared. The official returns of 1850, whilst giving L.129,846,800 as the whole gross agricultural produce of the empire, stated that of Lombardy as L.12,021,000, or less than one-tenth; yet the landed property in Lombardy pays about one-sixth of the direct revenue derived from the whole landed property of the empire.

Lombardy extends over about 5,292,447 English acres, of which 340,277 acres are lakes, rivers, and barren rocks, which, yielding no produce, are not included in the general cadaster. The remaining 4,952,170 acres are all surveyed lands, of which a little more than one-half, or 2,799,224 acres, are regularly cultivated, and the other 2,152,946 acres consist of woods, indifferent mountain pastures, marshy tracts, building land, or poor land, yielding scarcely any produce. The net income from all the surveyed land being, according to Jacini, more than L.4,300,000, gives an average return of about 17s. 4d. for each English acre. But as that landed property is encumbered with L.17,566,666 of mortgages, producing L.790,500 of interest at the average rate of 4½ per cent., it follows that, after deducting that interest, and the L.1,500,000 of government and municipal taxes, the net income that remains to the Lombard proprietors from their lands will be reduced to L.2,009,500, which, capitalized at 3½ per cent., the usual rate at which land is valued in the country, gives L.57,414,285 as the net value of the landed property of Lombardy. Though there are many large estates, yet most of this property is much divided, and its subdivisions increase every year. The number of landholders, which in 1838 was 385,826, in 1850 had increased to 437,725. But as many of those who hold property in various districts reappear several times in the returns, it is estimated that the land is actually distributed among 350,000 different owners; of whom about 3000 belong to the class of noblemen, and own, in the aggregate, less than one-fifteenth of the soil. There is therefore a landholder for every 8 inhabitants, for every 15½ acres of the whole area, or for every 8 acres of the cultivated land of Lombardy.

For the Venetian provinces there are no such detailed statistics. Their *surveyed* lands, capable of yielding a return however small, extend over 4,511,506 acres, of which 54,899 acres are exclusively devoted to vineyards. Nearly one-half of the whole extent, or 2,213,400 acres are arable lands, in many of which mulberry or olive trees, and vines, are scattered among the corn fields.

The following table shows the whole rateable income from lands and buildings in the Venetian provinces, as well as the comparative wealth of each province:—

Provinces.	Income.	Provinces.	Income.
Venice.....	L.203,597	Belluno	L.49,229
Padua.....	296,676	Vicenza	317,661
Rovigo.....	151,112	Friuli.....	212,663
Verona.....	298,356		
Treviso.....	210,481	Total.....	L.1,739,775

Lombardy. The quantity of cultivated lands in Lombardy, and their relation to the whole area in each province, as well as the mortgages that encumber them, and their net value, will be seen from the annexed table:—

Provinces.	Lands regularly cultivated.			Total extent of surveyed and unsurveyed lands.	Value of surveyed lands and buildings.	Average value of each acre cultivated or built upon.	Amount of mortgages.	Net value of the property.	Ratio of the mortgages to the value of the property.
	Irrigated.	Not irrigated.	Total.						
	Acres.	Acres.	Acres.	Acres.	£.	£. s. d.	£.	£.	
Bergamo...	137,593	241,080	378,673	1,062,839	9,500,000	62 0 0	1,680,000	7,820,000	17·68 per cent.
Sondrio ...	7,191	62,970	70,161	1,002,790	1,766,667	62 8 8	26,667	1,740,000	1·50 ...
Brescia....	268,035	193,582	461,617	760,618	12,333,333	66 0 8	2,166,666	10,166,667	17·57 ...
Como	7,824	239,913	247,737	613,091	6,766,667	67 6 8	1,616,667	5,150,000	23·89 ...
Mantua....	48,929	459,091	508,020	558,725	9,266,666	45 0 8	1,610,000	7,656,666	17·37 ...
Milano ...	121,402	263,800	385,202	450,984	16,566,667	106 6 8	6,766,667	9,800,000	40·84 ...
Cremona...	123,606	168,502	292,108	305,433	8,900,000	75 5 4	2,100,000	6,800,000	23·59 ...
Lodi.....	196,258	43,561	239,819	290,359	8,166,667	84 10 8	800,000	7,366,667	9·79 ...
Pavia.....	144,814	71,567	216,381	247,608	7,533,333	86 3 4	800,000	6,733,333	10·62 ...
Total....	1,055,652	1,744,066	2,799,718	5,292,447	80,800,000	71 6 8	17,566,667	63,233,333	24·74 per cent.

In few parts of Italy is education so general as in the Lombardo-Venetian kingdom. In Lombardy alone, in 1854, there were 5488 public and private institutions for elementary education,—2822 for men, and 2666 for women. In the same year, the children of an age to go to school were 192,545 boys, and 191,224 girls; and those who actually went were 146,907 boys and 128,199 girls. The largest attendance was in the province of Bergamo, where, out of 57,010 children, 50,734 went to school; and the worst in the province of Mantua, in which, out of 33,895 children, only 16,445 frequented schools. For the higher branches of education there are lyceums at Bergamo, Brescia, Como, Cremona, Mantua, Vicenza, Treviso and Udine; seminaries attached to every episcopal see; the universities of Pavia and Padua; medical and surgical colleges at Milan; several scientific and literary institutions, &c. In 1855 there were 12 newspapers and 47 scientific and literary journals and reviews published in the kingdom. Of the 6874 works published in the Austrian empire in 1853, 1444 were published in Lombardy, and 1194 in the Venetian territory; total 2638,—of which 128 in folio, 621 in 4to, &c.; 2550 of them were in Italian, 50 in Latin, 8 in French, 7 in Greek, 4 in English, 4 in Armenian, 4 in German, and 11 in other languages. The largest items were—

	In Lombardy.	In the Venetian.
Asketics.....	161	53
Medicinal and Veterinary.....	139	161
Novels and Tales.....	122	36
Theatre.....	113	14
Theology and Ecclesiastical History.....	112	99
Historical.....	119	64
Legal, Economical, Statistical.....	84	185
Education.....	93	59
Philology, Antiquity, &c.....	75	90
Geography and Ethnography.....	81	73
Chemistry and Natural Philosophy.....	63	23
Agriculture and Horticulture.....	58	14
Belles Lettres.....	33	3
Commerce and Industry.....	29	24
The Fine Arts.....	27	43
Poetry.....	26	50
Architecture, Railroads, &c.....	23	47
Encyclopædias, Collections, &c.....	17	114

In Lombardy, in every 26 births, there is one illegitimate child; the proportion is about the same in the Venetian provinces. Yet the state of public morality, especially among the numerous agricultural classes living scattered in towns and villages, is much better than what that number would represent, as many legitimate children, secretly left at the foundling hospitals by parents utterly destitute of means to rear them up, are calculated as illegitimate. They are often the unfortunate offspring of marriages entered into too hastily, and without means, by very young men, in the hope of evading the law of conscription.

The poor find some relief in their want and illness from numerous hospitals, houses of refuge, charitable institutions, &c. The aggregate income of all these establishments in Lombardy in 1844 was L.427,022, of which L.149,980 being absorbed by burdens and expenses of administration, there remained L.286,797 a-year for charitable purposes. Their revenue has increased considerably since that time. There are besides 27 *Monti di Pietà*, or public pawning-houses lending money at a very low interest. Their total circulation is nearly L.100,000 a-year, for which they receive about 300,000 articles in pawn.

Great convenience is also afforded to the poorer classes by savings-banks, the first of which was opened at Milan in 1823. At present there are 14 in Lombardy, all under the management of a central committee. They receive deposits of from 1 to 300 lire (from 8d. to L.10), on which they pay an interest of 3½ per cent. From the 1st July 1823 to the 31st December 1855, they had issued 169,989 account-books, and had received 1,108,598 deposits for L.4,967,510, on which L.479,697 of interest had accumulated; they had made 526,439 reimbursements to the amount of L.3,715,756. On the 1st of January 1856 they had a balance of L.1,731,450 deposited by 66,134 different persons, giving an average of L.26 for each person. On the 30th December of the same year the amount deposited had increased to L.1,897,562. In the government of Venice it is only within these few years that savings-banks have been introduced; but their operations as yet are not very considerable. On the 31st December 1854, they held a balance of L.62,998, deposited by 1837 persons, each at an average amount of L.34, 5s. 4d.

The whole kingdom may be divided into three distinct regions:—

1. The *Mountain Region*, which comprises the whole province of Sondrio, the greater part of the provinces of Como, Bergamo, and Belluno, more than two-fifths of the province of Brescia, and some districts of the provinces of Udine and Vicenza; altogether about one-third of the kingdom. It is the region where property is mostly subdivided. Its trees are chiefly fir, larch, birch, oak, and chestnut. There are summer pastures in the mountain slopes and valleys. The vine, the mulberry, and common fruit trees, are grown on its southern declivities, which are cultivated with great care and labour; the ground is formed in terraces, which are sometimes supplied with earth from some distance to replace what is washed away by the heavy rains.

2. The *Hilly or Sub-Alpine Region and Upper Flat Country*.—It embraces the southern part of the provinces of Como and Belluno; the northern part of the provinces of Milan, Mantua, Verona, Vicenza, Treviso, and Udine; and the central districts of the provinces of Bergamo and Brescia. Its chief productions are,—silk of the finest description, wine, maize, millet, chestnuts, fruit, and vegetables. Even lemons are grown on the southern shore of the lake

Lombardy. of Garda. It is the region which contains most of the manufactures of the kingdom.

3. The *Low Flat Country*, which comprises the southern part of the provinces of Brescia, Bergamo, Milan, Mantua, Padua, Treviso, and Udine; and the whole provinces of Pavia, Lodi, Cremona, Rovigo, and Venice, including the marshy lands and extensive lagoons all along the shore of the Adriatic. It is the region of irrigation and of *malaria*. In many of its districts, sickness is marked in the complexion of the inhabitants, and numbers of Tyrolese and Illyrian peasants who descend from their mountains to gather the harvest, fall victims to the marsh fevers. The whole central part of the basin of the Po, on its left bank, is within this region. Its chief productions are,—the Parmesan cheese, rice, silk, wine, maize, flax. Property is less subdivided than in the two other regions.

As Lombardy is the most densely peopled, so it is the best cultivated district in Europe. Its wealth and prosperity being derived chiefly from the productions of the soil, an extended view of its agriculture must be of much importance; and we enter upon the subject here, because in the description of the agriculture of the other parts of Italy, it will only be necessary, in the progress of this work, to refer generally to the practices of Lombardy, and to point out the few differences that may exist.

The importance of irrigation is more felt, and the practice of it more extended, in Lombardy, than in any other part of Europe. This depends much on the physical features of the country, which, as it has been stated, forms in great part a gentle slope from the foot of the mountains, where are those large reservoirs of water already described, to the bed of the Po, into which finally empty themselves the numerous streams that, issuing from the lakes, serve the double purpose of internal navigation and of irrigation.

The facilities for irrigation in the best districts have been much increased by the construction of canals, which, whilst they serve the purpose of inland navigation, are made use of to convey streams of water over the fields, which pass from the property of one proprietor to that of another, till they again enter the canals at a lower level. Some of these canals are the work of remote ages. The most ancient, as well as the most considerable of these, is the *Naviglio Grande*, which was opened in the year 1270.

An ancient law of Lombardy has contributed, from the most remote period, to the extension of the distribution of water. The whole of that substance was the property of the sovereign. An individual, or a corporate body, might purchase the water, and thereby acquire the right to conduct it by canals in any direction, and there to sell it to the cultivators. But they could not carry it through gardens or pleasure-grounds, and were bound to pay the owners of the land the value of that portion which was made use of for the passage of the water. In process of time the right of the sovereign over the water was ceded to those who became the purchasers thereof, and was at length extended to those who had springs on their ground, or should afterwards discover any.

The value of water in Lombardy is best seen by a comparison of the rent paid for land of the same quality, according to the power of obtaining irrigation. Dry meadows will let at from 24s. to 40s. per English acre, and that so situated as to be accessible to water is eagerly rented at from 48s. to 160s. per acre, according to its greater or less capability of obtaining water.

The purchase and sale of water is a traffic of much importance in Lombardy. There are individuals whose sole but respectable incomes are derived from such operations.

The distribution of water is settled for a term, with strict covenants between the parties. Fixed days and hours are appointed for opening and shutting the sluices, and watchful guards are appointed; but, in spite of all precautions,

the courts of law are supplied with most abundant processes from the several parties. The volume of water is reckoned by means of a local measure called the *oncia*, being about two English inches. A mechanical contrivance, invented by Ferrari, has for a number of years been applied to the measuring of water, and has been found to be accurate in its operation.

The value of water depends upon a variety of circumstances, and the purchaser can afford to pay more for that which is applied to gardens and to meadows than for what is wanted on arable land. The water of the canals is of more value than that which comes immediately from springs or from small brooks. That water which has passed over the land is worth more than that immediately from the canals, as it is supposed to bring with it more nutritive particles. In the vicinity of Milan the water of the Vettabbia is more valued than any other, because it contains particles of matter collected from the filth of the city. In that neighbourhood, the common water obtained from the other canals is generally, where a constant stream is bought, paid for at the rate of from L.40 to L.50 the *oncia*. If it be bought for the winter only, the payment is not more than the same number of shillings. Some instances are stated by a writer of accuracy and veracity, where an *oncia* of water has been sold for more than L.600. (Breislak, *Descrizione Geologica della Provincia di Milano*.) See IRRIGATION and HYDRODYNAMICS.

Whatever may have been the original component parts of the soil of Lombardy, yet from the great facilities for irrigation, those lands which are susceptible of that operation have become the most productive of any in the kingdom, or perhaps of any in Europe. There are, however, some exceptions; they are indeed but few, and chiefly confined to the vicinity of Mantua, where, even with great power of watering, the land, which is mere sand, does not produce copiously.

These watered lands may be divided into three classes: The first of them, "convertible meadows," or, in Italian, *Prati a Vicenda*, are the most abundant, and are constantly increasing. They are prepared to be laid down in grass by previous corn or green crops, and those are preferred which require good manuring, and also best tend to clean the land from weeds. The course adopted, therefore, is to grow maize and then wheat, or to sow hemp, succeeded by millet, and that followed by wheat; or, in the first year, to sow hemp and then millet, in the second year maize, and in the third wheat. In each of these rotations a half fallow is introduced, and the ground three or four times ploughed, and such fallowing is either in the spring or the autumn, as may best suit the variations in the rotation. Red clover is generally sown in the wheat, which yields a good crop the first year after the wheat harvest, which usually takes place in June, and in the following spring; but after that it disappears, and gives place to most abundant crops of white clover. It continues in grass for three, or in some cases four years, during which time it is mowed three, four, and even five times in the course of the summer. During the process of fallowing, great pains are taken to remove any such inequalities of the surface as would impede the equal distribution of the water over the whole of the field. The soil is removed by a machine contrived for that purpose, from any part above the level of the field, and thrown into the hollows. The field is divided into narrow beds, between each of which is a water-furrow. In the process of watering, these become first filled, and then from them the water is let in till it rises sufficiently high to cover the whole surface of the land. The same furrows, in excessively rainy weather, serve to drain the land of its surplus moisture. The mode of ploughing naturally raises the middle of the bed somewhat higher than the sides of it, but the difference seldom ex-

Lombardy ceeds four or five inches. The application of fields of this description may be generally stated to be as follows: Three-sixths grass, one-sixth wheat, one-sixth maiz, and the remainder flax, beet, rape, or other green crops. There are, as must be obvious to any one acquainted with agriculture, many variations; but, assuming the crops to be grown in that proportion, we cannot be far from accuracy. The portion of the grass land on these meadows is very great; in many instances, where there have been but three mowings and subsequent feedings, they have yielded six London loads of hay to the acre on the average of years, and in some of the best farms near Lodi, a load more. There may be mentioned amongst the convertible meadows, those which are chiefly cultivated with rice, which are on the lowest level, and where the watering is the rule, and the letting them dry the exception. The water on them is stagnant during the greater part of the growth of the crops; but, to change the rotation, it is in some years cultivated along with other plants. Such lands may be generally stated to yield, one-half of them rice, and the other half an equal portion of clover, wheat, and maiz.

The second of the classes of watered lands are those denominated "permanent summer meadows" (*Prati stabili estivi*). These are, day by day, diminishing in extent, as the cultivators become convinced that it is more profitable to change the plants for a few years, than to leave them constantly in grass. The difference in produce between these and convertible meadows arises chiefly from the gradual disappearance of the clovers, and their place being occupied by a variety of the common grasses. They are fitted more for having their plants converted into hay than those of the convertible meadows, and less adapted for the growth of those kinds of grass which are, in conformity with the general practice of the country, most beneficial for stall-feeding. After the last mowing, they are depastured by the oxen.

The most important portion of the land in Lombardy is that part designated as "permanent meadows" (*Marcite*). In laying them down, great attention is paid to levelling the surface, so that no inequalities may prevent the regular distribution of the water in passing over them, and that in no part there may be hollow places in which it can become stagnant. They can only be created in situations where a flowing stream can in all seasons at pleasure be turned over them. They are usually laid down by sowing them with *Lolium perenne*, or rye-grass, with about one part of red clover; and the sweepings of the hay loft are abundantly scattered. As these meadows grow older, other grasses appear; and in the latter mowing of each year, a large portion of white clover is always found. These meadows are well dunged every year, and the omission of it, even once, is considered by good cultivators as an unpardonable fault. Thus, if the other descriptions of land are not manured, it is because all of them are sacrificed to the winter meadows. Everywhere are to be seen on them heaps of manure, which are to be prepared during the summer, in

order to be carried out and equally spread over the surface in the autumn. Those who intend to mow their meadows in the middle of December, carry the manure on them in the latter end of September, and then begin watering them; but those who design to mow them in January carry on the manure at the end of October, or till the middle of November. If sufficient manure be not obtained from the farm, either ground rape-cake or ashes are used abundantly for the purpose, and thickly scattered over the soil.

The manure is separated as much as possible before the watering commences. At first the water is turned over the meadows in very small quantity, that it may produce the solution of the manure, and thus sink it down to the roots of the plants before the force of the stream can carry it away. Afterwards the water is let on in greater quantities, and especially when the temperature of the air is below the freezing point. At such times the greatest attention is given to create such a current of water as shall prevent it from freezing. If the cold is sufficiently strong to form a thin coat of ice, which rarely happens, the water is instantly withheld, and thus the soil remains free from frost, whilst a thin sheet of ice covers it; and if the cold, as usual, is but for a few days, an additional stream of warmer water melts the ice or carries it away, and the grass remains uninjured, and continues to grow. If, however, the frost should be so strong as to freeze the ground, the first mowing of the meadow would be lost; but such occurrences are so very rare, that they are looked at without apprehension, by the cultivators.

As the chief profit as well as the receipt of ready money to the cultivator depends upon the cheese he makes, it becomes of great importance to him to have an abundant supply of green food to produce the milk; and this, which to the farmer is afforded in the N. of Europe by the use of turnips, mangel-wurzel, or meal in tepid water, is supplied in Lombardy, during ten or eleven months, by his winter meadows. It is hence not a subject of surprise that every other portion of his land is sacrificed by the Lombard farmer to the necessity of raising the product of his winter permanent meadows to the highest possible state of productiveness.

As the lands here spoken of are continually in a state of producing crops, they would in time become exhausted in spite of the irrigation, if they were suffered to remain without the application of abundant manure. Although some considerable quantity of extraneous manure is to be procured from the large cities, by those cultivators who carry on their operations near them, or the canals connected with them, yet the larger portion is provided for by the live stock which is maintained on the land. The chief labour of ploughing, except in a part of Pavia, is performed by oxen, and horses are used for the carts and waggons only. The cows are kept in the best possible condition, in order to enable them to yield milk in the greatest quantity, and of the richest quality. The number of black cattle is considerable, as will appear from the following official account of what existed in 1852:—

Provinces.	Oxen.	Cows.	Bulls.	Young Cattle.	Total.	Rams.	Sheep.	Lambs.	Goats.	Total.	Pigs.
Milan	11,497	40,704	615	2,654	55,470	21	545	113	143	822	11,841
Bergamo	11,069	44,549	453	10,849	66,920	3,207	38,033	12,263	19,207	72,710	15,425
Brescia	33,844	15,079	344	4,858	54,125	925	12,421	3,036	5,435	21,817	19,554
Pavia	4,749	26,231	917	3,319	35,216	35	218	31	30	314	13,909
Como	13,846	52,842	390	12,355	79,433	2,433	21,307	5,560	18,368	47,668	8,681
Mantua	38,762	10,686	162	7,414	57,024	405	4,546	1,519	414	6,884	18,705
Lodi	8,639	27,452	816	4,661	41,568	93	931	213	81	1,318	17,131
Sondrio	1,632	22,842	250	5,558	30,282	3,929	25,924	6,988	20,943	57,784	5,272
Cremona	15,531	8,989	337	7,007	31,864	36	643	203	200	1,082	9,425
Total.....	139,569	249,374	4284	58,675	451,902	11,084	104,568	29,926	64,821	210,399	119,943
Do. in 1854.....	137,219	246,131	4139	61,661	449,160	10,712	97,405	26,381	61,892	186,390	106,839

Lombardy. The whole of these animals are constantly fed in their stalls, or, if sent out to graze, it is but for a very short period. The use of roots, such as turnips, ruta бага, and mangel-wurzel, is almost unnecessary, as the cattle can be supplied with sufficient green food from the meadows the whole of the year. The farms where the convertible husbandry is followed have abundance of litter from the straw of the wheat, but especially from the leaves of the Indian corn, which, though good food whilst they are green, are, when they become dry, used in the cattle-stalls for their bedding. Whilst this practice of stall-feeding has been found by long experience the most favourable to the health of the cattle, it is decidedly preferable on account of the vastly greater quantity of manure which it produces. On all the meadow farms a great number of pigs are fattened on whey mixed with the flour of Indian corn. These are put into the sties when they have attained the weight of 100 or 110 pounds, and are kept there during five or six months, till they attain the weight of 350 or 360 pounds. It is found that twenty such pigs yield ample manure for four or four and a half acres of the meadow-land. This kind of manure is highly esteemed for that purpose, but more especially so when proper reservoirs are constructed, out of the influence of the sun or the rain, for the preservation of the urine of the animals. In Lombardy are many small occupiers of land, who have not a number of cows sufficient to yield as much milk as will make a cheese daily. These sell their milk to the cheese-makers near them. In their agreement for the milk for the year, the purchaser contracts to keep in the seller's sties a number of fattening pigs, determined upon by calculation of the quantity of milk which the cows will yield. The number of swine fattened by the meadow occupiers, which in 1852 amounted to 119,943, was reduced in 1854 to 106,839; their flesh is in part made into hams, bacon, and especially sausages.

In a country where the land is chiefly ploughed with oxen, and where, as in Lombardy, much work is performed with the spade and the hoe, the number of other beasts for draught will be proportionally inconsiderable. This is the case here, as the following official account shows, as far as relates to the government of Milan:—

Account of the number of Draught Cattle in 1852 and 1854.

Provinces.	Horses.	Mules.	Asses.
Milan	10,519	1,907	2,233
Bergamo	7,096	2,227	2,982
Brescia	8,374	2,453	2,818
Pavia,	7,207	349	460
Como	3,622	2,231	2, 99
Mantua	8,426	1,268	1,706
Lodi	12,129	435	1,029
Sondrio	1,413	462	604
Cremona	11,764	878	812
Total	68,550	12,210	15,141
Do. in 1854.....	68,738	12,054	15,557

So scanty a stock of this description of animals can yield but little manure, how carefully soever it may be preserved; nor, with the addition made to it by the 186,390 sheep and goats that are kept, will it bear any comparison with that arising from the 449,150 head of black cattle.

It deserves notice, with reference to this subject, that the rural parts of Lombardy exhibit but few houses except those of the mere peasantry. The proprietors of even the smaller properties, though they may in some measure be viewed in the light of cultivators, yet, placing their estates in other hands, on the system of the *mezzeria*, seldom find it necessary to reside on or near them, and are satisfied with visiting them at the seasons when the produce is to be

divided. When the estates are of small or of moderate extent, Lombardy, or when they are large and comprehend several farms, the superintendence is intrusted to their agents. Such agents, also, in some cases, have the disposal of the share of produce, and account for the proceeds to the proprietors of the soil.

The great body of the population who are in circumstances of even moderate ease are thus collected in the cities and large towns; and in them is thus also collected that mass of corrupted vegetable and animal substances which is most adapted to the purposes of manure, and which is carefully preserved for that application. The cities and towns thus contain a larger proportion of the whole inhabitants than most of the other parts of Europe. If the numerical portion is not greater, the portion who, by their mode of living, produce the greatest quantities of exuviae, which are convertible into manure, is much larger. Such of these substances as are of the liquid kind, or are the most easily reduced to that form by putrefaction, are carried into the canals and rivers on which the cities and towns are built; and, when their water is distributed over the first fields with a gentle motion, to enrich them by the deposition of the matter they contain in suspension, no other manure is required to be applied. Whilst the lower grounds near the cities are refreshed by these means, the higher grounds are supplied, with little expense of labour in the conveyance, from the substances which retain a solid or less soluble form.

With the best farmers it is the custom every year to clean out the small canals of irrigation that are formed in every part of the meadow-lands. These ditches contain a compost of various earths, with a large quantity of vegetable and animal matter produced by the decomposition of many organic substances. It is obvious that each of these canals becomes a reservoir, in which is deposited the matter which the water has brought, and which being mixed with the earth in them, must have a great degree of activity in promoting vegetation.

In some lands of an inferior quality, the practice of growing green crops, and ploughing them in to form manure, has been introduced. A kind of bean called *fisole*, a species of lupin, grows almost spontaneously on some of even the poor soils. When they are cultivated, they produce a large quantity of succulent vegetable matter, which, when covered with earth, and mingled with it, forms an excellent pabulum for other plants. By two operations of this kind in succession, some of the poorest soils on the hills of moderate height have been sufficiently enriched to bear profitable crops of wheat. There is a part of Lombardy, not inconsiderable, where very little or no manure is applied to the land, and yet it is cultivated with corn, though the crops grown are very scanty. It is a portion of the delegation of Mantua, and not far from that city. It is easily susceptible of irrigation, but the soil is one of the poorest descriptions of sand. It is chiefly cultivated by small occupiers. These tenants have no cattle of any kind, and the whole labour is performed by the sole use of the spade and the hoe. Their dwellings and their clothing are of the most wretched description; their food of the coarsest kind, and of that they have at times a bare sufficiency. Their usual course of cropping is alternately with Indian corn and wheat. The farms are from four to eight acres in extent, and are divided into two equal parts, growing the two kinds of corn. One-half of the produce is delivered to the proprietor, out of which he pays the taxes, and the other is for the subsistence of the occupier. In some cases the owner takes that half which consists of wheat, and the tenant is supported on the Indian corn. The value of these is nearly equal, as the price of wheat is commonly about one-third higher than that of maize, whilst the quantity of the latter exceeds that of the

Lombardy. former in about the same proportion. As the maize is nearly three months in the earth, and the wheat scarcely more than six months, there is an interval between the crops, during which the soil, by being frequently turned over by the spade, imbibes a certain portion of oxygen, which, with the addition of water by the irrigation, furnishes food for the plants.

A district adjoining to this, with a soil somewhat less sterile, but capable of constant irrigation, is chiefly cultivated with rice, growing almost continually, or with very short intervals, in the water. The inhabitants are scarcely maintained on better or more abundant provisions; and, on account of the maladies produced by the stagnant water, are remarkable for their sickly appearance, and for the short duration of their lives.

Lombardy comprehends a large portion of the Alps within its limits. The elevated pasture lands on these mountains are stocked with cattle only during the summer months. At that time the peasants take up their temporary residence in the chalets, and there convert the milk of the cattle into butter and cheese, as is practised in the adjoining Swiss cantons. The dung of the cattle serves to refresh the pastures during the summer, but no extraneous manure is ever applied to them.

Some mineral manures are used, the most important of which is gypsum, which is ground in mills, and then scattered on the clovers and the grass. Lime is used as a manure in some of the provinces. It is laid on the ground in heaps in October, and covered with the soil; and after the sowing of wheat, the compost with the lime, completely slaked, is spread over the field. The quantity of lime is very small.

In taking a view of the amount of the produce of land in Lombardy, it may be best to begin with the estimate of the *marcite*, or winter-watered meadows. These are commonly mowed four, five, and even six times in the year; but it is not very easy to determine the quantity of hay they yield, because the chief portion of their produce is consumed by the cattle in the stalls, in the form of grass. One of the most accurate of the practical cultivators (Berra) constructed a weighing-bridge at his farm, over which every load of grass brought from his meadows, as well as the manure carried on them, was weighed and registered. According to him, the average produce, for a series of years, was as follows, in English cwt., and English statute acres:—

	lb.
1st mowing in January.....	11,160
2d ... March.....	16,512
3d ... May.....	17,220
4th ... July.....	9,664
5th ... September.....	8,244
	<hr/> 62,800

That is, 560 $\frac{1}{4}$ cwt., or 30 loads.

The whole of the grass which is cut in January and in September is eaten in the green state, and the hay is made almost exclusively from what is cut in May and July. In what is converted into hay, it is found that there is a loss of weight by drying, equal to three-fourths. It is supposed that, from its containing so much more water, the grass cut in January and September would lose five-sixths of its weight, and that cut in March four-fifths. This view would give six loads of the finest hay as the annual produce of an English acre. There is good reason to believe that this may be near an accurate estimate, because the best meadows frequently, in the two mowings of May and July, yield more than at the rate of five loads per acre; but these are in the vicinity of the city of Milan, where the water that irrigates them is more fully impregnated with the rich drains from the city than that at a greater distance from it. From the last mowing in the beginning of

September, till the end of November, the cows are fed on Lombardy. the meadows. Thus, to the estimated crops of hay, must be added the value of this pasture for the cattle during about two months. The usual price for the best hay in the cities is about 40s. sterling the load. The cost of making it, where the weather is so settled as it usually is in Lombardy, must be trifling, and that, with the mowing and carrying, cannot exceed the value of the after-feeding, so that each acre will give a profit of L.12 sterling annually. It is not then surprising that such land can be sold as high as 1000 lire the *pertica*, or L.200 sterling the English acre, an occurrence by no means unusual.

The profit of these meadows does not arise from the sale of hay, which, in a country where few horses are kept for pleasure, must necessarily be very insignificant, but from the fattening of cattle in a small degree, and the operations of the dairy as the most important pursuit. The dairies are extensive, and carried on with the greatest care and most scrupulous attention to cleanliness. The dairy-farms in the three provinces of Milan, Lodi, and Pavia, are mostly occupied by persons of competent capital; many by the proprietors, and the rest by tenants who are not metayers, but have leases for a term never exceeding nine years, at a fixed money rent. They, unlike the farmers in other parts, are the owners of the live stock, and of the implements of husbandry, have comfortable dwellings, are well informed and active, and with diligence unite much economy.

The dairies of the three provinces of Milan, Lodi, and Pavia produce the best cheese, distinguished by the name of *Parmesan* in most parts of Europe, but in Lombardy commonly called *Formaggio di grana*, with the addition of *maggengo* or *invernengo*, according to the season in which it is made. The annual export of this cheese to foreign countries amounted to 1,800,000 pounds in the year 1824, besides what was consumed in the Italian and German provinces of the Austrian empire. At present, the annual produce is estimated at 51,520,000 lb., worth at least L.1,333,333 in the country itself in which it is made.

The operative part of making the cheese is confined to experienced practical men, who acquire a tact that enables them to time the several steps of the process with great accuracy, and without the aid of a thermometer to ascertain the requisite heat of the materials in each of these steps. From the nature of the climate, the milk will not keep long, but a cheese must be made every day. The cheeses are most valuable when they are large; and as the greater number of farmers have not milk sufficient to make such a cheese daily, the milk is sent by them to other farmers, so as to make up the requisite quantity. Sometimes four, or five, or more, small farms contribute their day's milk to one who has more stock, to make the cheese; and there are instances where the cheese-maker buys the whole of the milk from which his cheese is made.

The cows are milked evenings and mornings; in the first case about five or six o'clock, in the second at day-break, or just before. The milk of the evening is skimmed of what cream has risen on it before eight o'clock, and the milk of the morning, of that small quantity which is thrown up between day-break and that hour, and from that cream butter is made. Though the Parmesan cheese is thus made from skimmed milk, yet a very large portion of the cream is still left in it to enrich the cheese. The milk is then placed in a kettle, and warmed to the heat of 81° Fahrenheit, when the rennet is applied, the effect of which is increased by a small addition of vinegar, and sometimes of grated cheese, and a very small quantity of pepper. The other parts of the process so much resemble the practices in the best dairy-farms in England, as not to require any special notice.

It is salted after it is made, by sprinkling the surface

Lombardy. with that substance daily during six weeks, and turning the cheese to imbibe the particles. These cheeses vary in weight, when fit for sale, from 52 to 122 lb. avoidupois. They are kept some time before they are sold, a few at eight months, some at one or two years old, a less number at three, and a few at four years old. It requires much care to preserve the cheese against the heat of the climate. At Codogno and other places, where the wholesale trade is carried on, there are large magazines on the ground-floor, twenty feet in height, with shelves around, on which each cheese is placed singly. They have large windows, which are carefully shut to exclude the sun the whole day, but are opened during the night. It is difficult to estimate correctly the average quantity of butter and cheese produced from a given number of cows. On one farm, in the province of Lodi, there were 91 cows, from which were made 173 cheeses, varying in weight from 50 to 120 lb., but the weight of which the man who weighed them averaged at 100 lb. each. These had been made in the preceding six months and a half. Supposing the remainder of the year to be equally productive, the whole herd would have yielded, on an average, at the rate of 370 lb. in the year. There was, however, no certain account of the quantity of butter made on the farm during the period; and the quantity of cheese alone, though correct, does not give any certain data upon which to frame an estimate of the productiveness of the animals. The proportion which the cheese bears to the butter varies in the different irrigated provinces. Thus, according to the estimate of the accurate Signor Berra—

100 lb. of milk yields in Lodi $2\frac{3}{10}$ th lb. of butter, $6\frac{3}{10}$ th lb. of cheese.

100 lb. of milk yields in Milan $2\frac{1}{10}$ th lb. of butter, $6\frac{1}{10}$ th lb. of cheese.

100 lb. of milk yields in Pavia $1\frac{3}{4}$ th lb. of butter, $5\frac{8}{10}$ th lb. of cheese.

The farms in these provinces are generally small. One of 250 English acres would be denominated large; and though there are a few that exceed that extent, yet the greater portion of the irrigable land is occupied by farms much below one-half of that extent. Amongst the occupations that are confined exclusively to the *marcite*, or winter-watered meadows, many, perhaps the greater part, do not exceed forty acres. As the farms are small, so there are very few great proprietors. The family of Luoghi Pii have the greatest tract of the best land in the province of Milan, divided into many farms, and said to amount to 3000 acres. No other exceeds one-third of that extent.

The value and the rent of land depend less upon the natural fertility than upon the local situation, on the power of irrigation it can command, and on the capital expended on making roads to it, fences around it, and in erecting houses and agricultural buildings. In the vicinity of the city of Milan, those winter-watered meadows have the greatest value which are to the south, and are watered from the canal of Vettabbia, whose waters bring with them the precious manure of that populous place. The price of such land is about L.130 sterling the English acre, and, if it has good roads and buildings, may be let to good tenants at from L.6 to L.7 per acre. The land which has not sufficient irrigating power to form winter-meadows, but enough for the purposes of convertible husbandry, is worth from L.50 to L.60 per English acre, and may be let at from 60s. to 70s. per acre. In these cases the taxes and repairs are paid by the proprietor, as well as the contributions collected for keeping in proper repair the canal by which water is conveyed. Some parts of the irrigable provinces have lands of inferior natural quality, but being on the banks of the Po, are well calculated to grow rice, by their capability of being constantly flooded.

It is difficult for a stranger to generalize with any accu-

racy the value of land, or the rent of it in due proportion Lombardy to the amount of the sum invested on it. An opinion generally prevails that the capital laid out in land might be assumed to pay an annual rate of interest of about four per cent., but that as most of the rent, with the exception of the irrigated provinces, is paid in produce, those who employ factors to manage their property, or who manage it themselves, without great judgment and perpetual watchfulness, could scarcely calculate on obtaining more than three per cent.

It may serve to give some idea of the difficulty of ascertaining the amount of the rent of land, if a slight view be taken of the description of the classes of persons occupied in cultivation. The first of these is the *affittuario*, who somewhat resembles the middle-man now generally to be found in Ireland. They rent large portions of land at a money price, and let it out again to sub-tenants, who work it, if in small lots, by means of their own family, with an additional servant or two, or, if large, by day-labourers and their families, who are established on the property.

The next class is called *conduttori*, or *fittaiuoli*, or farmers. These are the most advantageous to the proprietors, and they are tolerably numerous, as well in the Venetian as in the Lombard provinces. This class comprehends the farmers in the watered provinces, whose chief object is the making of cheese, in some cases combined with the culture of rice. These lay out large sums at first, and have a good stock of cattle and utensils, and a sufficiency of capital. The advantage of this class to the proprietor is obvious. They take from him the labour of superintendence, and all risks from failing years and from loss of cattle; and, having leases renewed every nine, twelve, fifteen, or eighteen years, they can have no inducement to destroy the fertility of the soil. Though many of them have more extent of land, the greater proportion may be described as occupying from seven to twenty-five acres.

The third, and by far the largest class of all, are the *coloni*, colonists, sometimes called *pigionanti chiusuranti*, who occupy from an acre and a half to three acres of land, with a cottage. These premises they take either of the proprietors, of the middle-man, or of the farmers, and pay a rent by a share of the produce. Some colonists pay to their superiors a fixed quantity of corn yearly, or its equivalent in money and an agreed proportion of the other products, such as wine; or, in many cases, the whole of it is divided. When these shares are not too small, and the ground is fruitful, the most common custom is to pay a distinct measure of corn, and the half of the wine. The meadow land is paid for in money, in silk-worms' eggs, or in cocoons. The cattle, perhaps a cow and a donkey, are furnished to the colonist on credit, and if his terms are favourable, and he gets forward, he becomes the proprietor of them as well as of the utensils; but if the land is unproductive, or the shares of the proprietor too great, he must give up the cattle and the utensils, and may then be permitted to continue on the land, giving to the proprietor one-half the produce, or, if the crops prove heavy, a still larger share.

The farmers of the great estates in the watered provinces are in prosperous circumstances, and generally well educated persons; and their chief occupation consists in overlooking the workmen, and making the due bargains for the disposal of their produce. They are also necessarily furnished with some capital, as a proof of which, one near Lodi, occupying a farm of 250 English acres, upon which were 58 cows, a bull, and 8 horses, and who had on hand the cheese made in the six preceding months, asserted that the value of his stock exceeded L.800 sterling. On that farm there were 22 families of day-labourers. Six or seven men, the heads of those families, were in the constant employment of the occupier, either as herdsmen, ostlers, or

Lombardy. stable-servants. All the rest, and the females and children, were only employed when there was work to be done, for which they were paid daily wages, viz., to the men about fourpence halfpenny a-day, to the women threepence, and to their children from twopence to threepence, according to the age or strength. They had also one meal a-day, consisting of rice and beans, but no wine, and meat only one day in the year. Some of them were occupied, on fixed terms, in rearing articles that required much labour to prepare them, and received a proportion of the product. Thus, of flax they received one-half, of maize one-third or one-fourth, and of rice one-seventh. When not wanted they may get occasional wages on neighbouring farms. In most of their habitations they hatch a few eggs of the silkworm, if they can find money or credit to buy mulberry leaves; and if not, they have some occupation in winding the silk for those who are a little better situated.

In those provinces of Lombardy which are not to any extent capable of irrigation, there are few large farms and no substantial farmers. The greater portion of the land is divided into small allotments of a few acres, either directly by the proprietors, or through the management of middle-men. The real cultivators, called also colonists (*coloni*), with their wives and children, perform all the labour, and contract to deliver half of the raw produce to the proprietor.

Instead of two or three acres of land, a few tenants have from 15 to 20 acres, and are enabled to keep two or three cows, and perhaps a horse or a mule. The cattle and utensils are their own property. They pay a moderate money-rent for the corn land, and divide with the landlord in equal portions the wine and the cocoons of the silk-worms. Such persons, if they perform the work by the members of their own families, subsist chiefly on maize, use no wine, and otherwise practise the most rigid economy, though they do not become rich, may live in a respectable and comfortable manner.

The chief product which is furnished by Lombardy to external commerce is silk, which interests more or less every family in the country, and receives the greatest share of general attention. As the quantity and the quality of the silk depend on the worms that spin it, the subsistence of those worms becomes an object which engrosses much consideration. The leaves of the mulberry tree are exclusively the food of the worms, and the greater weight of these leaves that can be gathered, the greater is the silk that is produced. In many parts are numerous nurseries, where those trees are raised, with most careful cultivation, from seed.

The wild mulberry, or *Morus alba*, yields the best leaves for the nourishment of the worms, and the silk they spin whilst feeding upon them is of the finest quality; but the quantity of leaves they yield is so small, that it requires a great outlay and a great number of trees to give sustenance to an extensive silk establishment; on which account they are grafted with other kinds of mulberry trees, which have larger and dark green leaves, and in such abundance that they yield at least double the weight of leaves. The finest silk is obtained from the wild ungrafted mulberry tree; the next finest from one of a new species produced by grafting; the third from the grafted white mulberry; and the coarsest from the black mulberry. The fruit of none of these trees is in any estimation. In order to procure more leaves, the cultivators of the trees, every fourth year after the leaves have been stripped, cut off all the smaller branches quite close to the principal ones. In the succeeding year the leaves are not taken from the new shoots, but they are in the next and following years; and in the fourth year, the shoots are as bushy and thick as if they had not been tapped.

It is difficult to form an average of the produce of mul-

berry leaves from each tree, as much depends on the soil, Lombardy. but more upon the age of the tree. As soon as they have attained 6 inches in diameter, they yield from 19 to 27 lb., and continually increase their produce till they attain a diameter of 2 feet, when they yield from 220 to 260 lb. Having then attained their full growth, they continue to increase in produce till they yield in some cases, but extreme ones, as much as 500 lb. The market prices of the leaves undergo a great fluctuation, varying sometimes 100 per cent. in a fortnight.

Some persons who have none, and others who have but few mulberry trees, yet breed silk-worms. They are careful to make contracts for what they expect to want, in March or April, when they are cheapest. It not unfrequently happens, that by a storm of hail the price is so raised that the breeder, instead of drawing a profit from his operations, finds he has paid more for the leaves than he can obtain for the cocoons. There are persons so skillful in estimating in the spring the weight of leaves which each tree will produce, that their assistance is commonly resorted to by those who make bargains for the leaves. When the worms begin to spin they require such a quantity of food as to raise the price of leaves; and if at that time a hail-storm should occur, the advance becomes most ruinous to the purchaser. In general the mulberry trees are, by the terms of the leases, let to the farmers or colonists, who divide the cocoons equally with the proprietors of the land. The tenant provides half the eggs, and superintends the insects, feeding them, and keeping them clean whilst they are working; the other half of the eggs, as well as the leaves, are the contributions of the landlord to this equally-joint-stock concern. The tenant estimates what worms can be nourished by the quantity of leaves the trees upon his farm will feed, and the two parties procure the estimated weight of eggs. If the tenant miscalculates, or if a hail-storm destroys his calculation, he is bound to purchase such a portion of leaves as will feed the insects through their working period.

The eggs of the silk-worms are made an object of trade by a few persons whose establishments are upon so large a scale as to make it worthy their attention. They are sold by weight, generally at about 2s. the English ounce. The eggs are divided into three classes. The worm from the first of them casts its skin four times, and is of a large size, and an ounce contains 24,024 eggs. Supposing each egg to produce a caterpillar, and each caterpillar a cocoon, as 110 cocoons weigh 1 lb., the whole ounce of eggs will yield 218 lb. of cocoons. The second also casts its skin, but the animal is of a smaller size, as are the cocoons; 1 ounce of them contains 25,185 eggs, and the cocoons produced from them weigh less, 216 being 1 lb., and consequently the whole weight of the cocoons is only 96 lb. The third class casts its skin but three times; 1 ounce contains 31,004 eggs, 440 cocoons weigh about 1 lb., and the whole weight of the cocoons is only about 70 lb.

In every house room is made for laying out the worms and even in the poorest cottages of the colonists it is so contrived that some space is allotted to them. Tables of reed are formed, about $2\frac{1}{2}$ feet in breadth, and from 15 to 18 feet in length. These are suspended from the roof, the upper shelf 2 feet below it, and others at 1 foot distance, with the lowest of them 2 feet from the floor. The windows are made of paper, to prevent currents of cold air, and too great heat; the shutters are of straw, and the door consists of a piece of old linen cloth. Within, the place is kept in darkness, except when the worms are to be fed or the place cleaned out, when lamps are used. In many of these places, thermometers, made of spirit of wine, are kept to ascertain the temperature; and show no other change of heat than that between the 16th and 20th degrees of Reaumur, to which limit it is deemed necessary

Lombardy. to confine their range of temperature. Habit, however, has given a tact, by which the people ascertain the degree of heat with tolerable accuracy.

Some of the colonists within a season produce as much as 140 lb. of cocoons. Taking their half of them at 70 lb., and estimating them at the average price (for there is great variation in the price) of 1s. 6d. per lb., it will yield for a month's labour, L.5, 5s., which is a large sum for persons in that condition of life in that country. From it, however, must be deducted the cost of leaves, when the landlord's trees do not yield as much sustenance for the insects as the tenant has calculated when purchasing the eggs.

The planting of mulberry trees, and the consequent produce of silk, have been constantly increasing of late years. It is an object of attraction to every grade of society, from the greatest landholder to the lowest of the colonists and day-labourers, whose energy has been stimulated by the constantly advancing price of raw silk, with few exceptional years, from 1814 to the present time. It has been ascertained that three-fourths at least of the mulberry trees in the kingdom are under 40 years of age, and that one-half of that three-fourths are of less than 10 years' growth. The greater number of them are to be found in the dry provinces, though their plantation has increased much even in the irrigated districts. From Milan to Varese, from that city to Como, and between Lecco and Bergamo, the cultivation of vines has almost everywhere given place to that of mulberry trees. They are very numerous on the hills round Bergamo and Brescia. In the province of Verona, especially between that capital and Desenzano, and from Castelnuovo, through Vallego, quite to Roverbello, the surface of the country consists of masses of rounded pebbles, washed down at some remote period from the neighbouring Alps. As much strong soil is mingled with these stones which is favourable to the mulberry trees, vast numbers have been everywhere planted; but owing to a prejudice that prevails in these districts against the practice of engrafting, the quantity of leaves does not bear the same proportion to the number of trees as in some parts of Lombardy. Mulberry trees are found, with less annual expense, more profitable than any trees cultivated for their fruit. The average profit from each tree, from five to fifteen years old, is reckoned to be about five shillings sterling annually.

It appears from the official statistics, that the quantity of cocoons produced in the kingdom at different recent periods was as follows:—

	1848.	1852.	1856.
Lombardy....	19,755,519 lb.	33,513,826 lb.	41,892,283 lb.
Venice.....	12,964,559 ..	22,335,201 ..	22,776,173 ..
Total....	32,720,078 ..	55,849,027 ..	64,668,456 ..

Supposing these returns exact, the production of cocoons in the four years from 1848 to 1852 had increased by more than two-fifths; and if, in the subsequent four years, the increase is found to be less than one-thirteenth, it must be borne in mind, that both in 1855 and 1856 almost *one-half* of the produce was destroyed by the prevalence of disease among the silk-worms.

The 64,668,456 lb. of cocoons produced in 1856, at the low average price of 17½d. per lb., would give a value of L.4,336,360. According to the ratio shown by Dandolo, those 64,668,456 lb. of cocoons, whilst requiring for their production the enormous amount of 9,043,499,700 lb. of mulberry leaves, must have yielded at least 5,021,559 lb. of raw silk, which, at a low average price of 19s. 8d. per lb. for the 3,123,546 lb. belonging to Lombardy, and 16s. 7½d. per lb. for 1,898,014 lb. of the inferior kind of the Venetian provinces, would be worth L.4,647,686. The operation, therefore, of winding the cocoons into raw silk gave a gross profit of L.311,276.

Of that quantity of raw silk only 4,299,471 lb., worth Lombardy. L.3,965,000, were spun and twisted in the kingdom, viz., 2,976,557 lb. in Lombardy, and 1,322,914 lb. in Venice. The spinning and twisting manufactures gave employment for the average period of 50 days a-year,—in Lombardy to 4500 men, 5500 women, and 2000 girls, besides 30,000 women more (the *incannatrici*) in their own houses; and produced about 2,822,217 lb. of spun or twisted silk (*organzine*), worth, at an average of 23s. per lb., L.3,245,556;—in the Venetian provinces to about 18,000 persons altogether, and produced 1,256,568 lb., worth, at an average of 18s. 9d. per lb., L.1,178,000. The gross produce, therefore, of the spinning and twisting manufactures was, in Lombardy L.317,666, and in Venice, L.78,000. A comparatively small quantity of spun silk is consumed within the kingdom; much of it is sent to be manufactured in Austria Proper, in Bohemia, and in Hungary, and a much larger quantity is exported to France and England.

The subjoined table shows the distribution of the produce of cocoons over the various provinces in 1856:—

Produce of Cocoons in 1856.

Lombardy.	lb.	Venice.	lb.
Bergamo	12,126,700	Verona	9,921,850
Milan	7,717,000	Udine	3,968,754
Brescia	7,055,555	Treviso	3,307,275
Como	4,409,700	Vicenza	2,645,860
Mantua	3,527,778	Padua	1,102,425
Cremona	3,307,275	Rovigo	771,700
Lodi	2,204,850	Venice	661,425
Pavia	1,102,425	Belluno	396,884
Sondrio	441,000		
Total	41,892,283	Total.....	22,776,173
		Lombardy.....	41,892,283
		Total.....	64,668,456

After reviewing the productions of most value, the cheese and the silk, a slight notice may be taken of the results of those other operations of agriculture which are almost exclusively confined to domestic consumption.

Of corn crops, the most extensively grown is maize. It is the chief nourishment of the working classes, and is deemed by them the most healthy and most strengthening of all grain. It has, too, the advantage of being most easily converted into wholesome food, requiring, unlike wheat, no assistance from the baker. It requires only a kettle and a little fuel to make it into polenta, a kind of thick pudding or gruel, which, without any addition, forms the common food of the peasantry. It is also a valuable product on other accounts. The grains in a green state are a substitute for green peas; the leaves, when fresh, are a fodder, on which cattle eagerly feed, and, when dry, they are used to make excellent beds, or rather mattresses; the stalks are used for fuel in that country, where fuel is scarce; and, finally, the feathery tops are converted into brushes for sweeping the houses.

Maiz is also cheaper than wheat, being commonly sold at about two-thirds the price of that grain; but, from its being the food of the far greater part of the population, in seasons of great scarcity, such as those following the harvest of 1816 and 1828, the indispensable demand for it caused the price to rise higher than that of wheat. More than one-third of all the arable land of Lombardy is destined to the cultivation of this grain, and the average product per acre is greater than that of wheat. It is grown almost indiscriminately on all kinds of soil, and is to be seen equally on the cold hills and in the warm valleys of the provinces. The culture of it does not appear to have received any improvement since its first introduction. It is in some cases sown broadcast, and covered in with the plough. From this mode of sowing it, it can only be cleared of weeds by hand, and the earth is thrown round the plants in the same way; whereas,

Lombardy. in the countries where it is sown in rows or drills, these operations can be more advantageously performed by appropriate instruments. The expense of this hand-hoeing and shovelling up the earth is said to be equal to the value of one-third of the gross product of the crop. It is customary, after the bloom is off, to strip the plant of its leaves, and also to cut the stalks above the cobs or ears, which, if not done too early, is not injurious to the grain. There are several species of this plant. The most common is that with a large yellow grain, whose cobs grow about half-way up the stalk, and which ripens in three months, if sown in the month of May. If it cannot be sown so early, or if it is sown after a crop of flax, or on clover after the first mowing, it is usual to sow another kind called *brigantino*, whose grains are smaller, and of a darkish brown colour. In the vicinity of Bergamo, the greatest quantity of maize is of this kind. There are some species of this corn of much smaller grains, called *cinquante* and *quarante*, from the number of days which pass between the sowing and the harvesting. These kinds are commonly sown on the wheat stubbles, or after a crop of flax or of rape-seed has been gathered. It is seldom very productive, and, if the field on which it is sown be poor, scarcely repays more than the seed and the labour.

In a country where the soil and the climate are so various as in Lombardy, and where the difference in the quantity of manure applied to the soil is so great in the several portions, it is impossible to arrive at any average calculation of the produce of maize per acre. Nothing more can be done here than to state a few facts on the subject. One very accurate cultivator on the richest irrigable land, to which abundant manure was applied, stated that his crops yielded annually in a series of years from 59 to 78 English bushels an acre. Another also, in the same circumstances, a few miles distant, gave his range of bushels at from 50 to 78 per acre. The other side of the picture is vastly different. According to an official valuation in the revenue office at Milan, the following average of the produce of maize in some of the poorest provinces is given, viz., in Verona, the greatest produce is rated at 15 bushels the acre; in Vicenza, from 32 to 42; in Padua, from 12 to 21; and in Udine, from 13 to 22. No other provinces are noticed in the account. To this account of the average produce of maize may be added calculations made by two of the most accurate agriculturists of Lombardy. Count Dandolo informs us, that the average produce from the colonists on his estates near to Vanese, on whose fields the peasantry had been induced to plant the beans called *fisole* amongst the maize, was 21½ bushels of maize, and 4½ bushels of beans. The average on the whole of his estate, including the part cultivated by himself, is stated to be 32½ bushels of maize, and 7½ bushels of beans. Another intelligent agriculturist asserted, that, according to the best calculation he could make, and he had taken much pains on the subject, the average produce of maize did not exceed 25 bushels the acre, which he considered to be a produce one-third greater than that of wheat. The quantity of maize grown in the Lombard provinces in 1854, was, according to the official returns, 973,024 quarters.

Rice is a plant introduced from India and China at some distant but not very remote period. According to some, it was known as early as the tenth century; but no one large field was cultivated with it, until a patrician of Milan, in the year 1522, first destined to it some marshy land upon his own estate in the province of Verona. In the province of Pavia it is the most profitable grain that is grown; and in the provinces of Lodi, Cremona, Verona, Mantua, and Milan, it always secures to the farmer moderate benefit. The yearly produce is about 165,072 quarters, much of which is consumed at home, as those who do not subsist on maize alone have one meal a-day of this article. Some of

it is exported, but the amount of that portion falls far short Lombardy. of the quantity imported for home consumption. Rice is a marsh plant, and can only be grown where the land can be covered with water. The evaporation is injurious to human health, and hence laws are enacted regulating the distance which must intervene between the rice-fields and the cities and towns. Without these restrictions, rice would be more extensively cultivated. Some portion of rice is grown in the rich provinces, as one of the crops in rotation of convertible husbandry. In this practice, called *risare a vicenda*, it is most commonly sown after clover. The land is ploughed very deep, but not harrowed. The water is then turned on, so as to cover the surface, and to show any inequalities which remained by the use of the spade. The seed is then sown, or rather scattered on the water, having been previously steeped during eight or ten hours to give it additional specific gravity, so that it may sink immediately to the bottom. If it were sowed after clover, two bushels of seed would be sufficient for one acre. When it is sowed, as is oftentimes the case, after maize, the quantity is usually three bushels.

The time of sowing is from the beginning of April till the middle of May. It remains covered with water to the height of from 2 to 3 inches, and in that state remains till weeding becomes necessary. That early sown requires the operation to be performed in the middle of May; that later sown, some time in June. It is executed chiefly by the females, who, with their lower garments tucked up, stand in water over the ankles, and with the hand pluck up the weeds by the roots. If the land were dry, the weeds would break off, and leave the roots to shoot out again. The most prevalent weed is the cockfoot grass, which, at an early period, it is difficult to distinguish from the rice. Besides this, there are several other weeds, chiefly of the rush kind. In the first year the operation of weeding is performed twice. If the same field be sown with the rice in the next year, once is deemed sufficient. This is the most expensive part of the process, and is said in the first year to require 25 days' work for an acre, which, as the employment is unpleasant and unhealthy, is commonly paid for at the rate of about 10d. per day. Much of this work is executed by the colonists upon plans marked definitely in their leases. The terms vary excessively, according to the locality and the soil. A common plan is, for the colonist to receive one-quarter of the gross produce, after the quantity used as seed has been abstracted from it. For this he is bound to perform the following portions of the labour, viz., the levelling of the surface, the sowing, the weeding, the reaping, and all the labour not performed by cattle, until the crop is placed on the threshing-floor. In the case of some of the poorest land, the colonist receives one-third instead of one-fourth, of the produce. About midsummer-day the water is allowed to run off the land, and during eight or ten days it is suffered to become dry. This is done to destroy the numerous water insects, which would prove injurious to the roots of the rice, and cause it to fall into the water.

Wheat is a grain not extensively cultivated in most parts of Lombardy, excepting in that portion of it which comprehends the mountainous Alps. There is but one species of it,—a winter wheat, sown between the first week of October and the first week of November; but the best farmers wish to finish their sowing by the 21st of October, if the season permit. The wheat is all of the bearded kind, the preference of which has been owing to the opinion that the beard is a protection against the fogs of the blooming season, and against the depredations of the small birds at the time of the grain ripening. The produce is a kind of wheat harder than that of the W. and N. of Europe; and from this circumstance it is better calculated to be converted into macaroni than our wheat would be. The

Lombardy. product of the crops is less per acre than it is generally in the German dominions of Austria, and less than in England or in the best parts of the Netherlands.

It is of course most productive on the best lands of the rich provinces, where irrigation is practicable to the exact extent which the nature of the crop may require. On that description of soil it is less profitable than other crops, and, therefore, only a small portion is applied to its growth; but even on the best of that land it is a rare event to obtain sevenfold the quantity of the seed that has been sown. In the neighbourhood of Mantua, where the poor colonists grow wheat and maize in alternate years, where the soil is sandy, and where, from the paucity of cattle, little manure is applied, it does not appear that the crop of wheat grown more than equals four times the seed.

In Verona, the higher part of which is stony, and the lower part sandy, the best of the land yields 10 bushels, and the worst only 6½. In Vicenza, where the soil is better, the lands of the first quality yield 18 bushels, those of the second 15, the lowest 12. In Padua, the first class of lands yields 15½ bushels, the second 11½, and the lowest class only 7 bushels. In Udine, a poor sandy soil, mixed with many pebbles, and where there are but few cattle, the first class of soils yields 10½ bushels, the second 9, and the lowest only 6½.

It is not easy to ascertain what portion of the fields is appropriated to the growth of wheat. On the best of the soils, according to the regular rotation of crops, one-half of the land is in grasses, the proportion of maize is greater than that of wheat, and some portion is sown with pulse, rye, millet, oats, flax, hemp, and other kinds of crops. In 1854 the wheat produced in Lombardy alone amounted to 697,186 quarters. The other kinds of grain are but very little cultivated.

Few things are more striking to a visitor in Italy from the N. of Europe, than the straight rows of trees of all kinds that run through the corn fields, at the foot of which vines are planted and trained, so as to extend in elegant festoons from one tree to another, exhibiting the pendant clusters of grapes. If the same mode of training the vines were attempted in the somewhat colder climates of France and Germany, the shade of the trees would prevent the grapes from ripening. This effect is not produced in Lombardy, where the berries become ripe, and, when eaten, are of good flavour; but the wine produced from them is in general of a bad or very indifferent quality. Though much of the wine is produced from such vines in the corn fields as are distinguished by the names of *Campi Arativi Vitati*, or of *Campi Arborati Vitati*, and from vines planted in rows at such a distance from each other as to admit of maize being grown between them, and called *Ronchi*; yet in some parts are vineyards properly so called, because, like those of France and Germany, they alone occupy the ground, and are, like them, supported by props. The best wine is produced from the *Ronchi*, and more especially from the vineyards properly so called, in which, however, each vine produces less in quantity than those trained from tree to tree. The amount of produce varies greatly according to different years, different districts, and different modes of cultivation. From an approximate estimation made on many farms of various soils, it would appear that, in the most productive districts, the average produce of large vines trained to the trees around the corn fields is from 48 to 52 gallons for 100 vines; and the average produce of vineyards properly so called, from 58 to 65 gallons of wine to the acre.

In Lombardy the wine is generally of a bad quality. Its production is left chiefly to that description of cultivators before noticed under the name of colonists, who exercise little discretion and little care, either in the choice of the kind of grapes they plant, or in the management of

the juice. Their chief care is to obtain the largest quantity, without much regard to the flavour or the aptitude of keeping; and commonly, as soon as it is made, they divide it in equal shares with their landlords. One cause to which the inferiority of the wine is attributed arises from the general predilection in favour of red wine, or, as it is called, *Vino Nero*, which is prized according to the darkness of its colour. In order to produce this deep colour, the skins of the grapes are left, in the first part of the process, to ferment with the juice. Sometimes this is suffered to continue during eight or ten days in a vat before the liquor is drawn off, and sometimes still longer, as the longer it continues the darker the wine becomes. The best wines are produced in the district near Varese, on the sunny slopes of the hills round the lakes of Como and Garda, and in the Val Calcepio in the province of Bergamo. The wines of the localities of Sassella and Inferno, in the Valtellina, maintain the ancient renown of the Rhaetian wines, relished by Augustus and celebrated by Virgil.

The wine of the Venetian provinces is, upon the whole, of a much better quality; its superiority is owing to the nature of the soil, to a better choice of the kinds of grapes that are planted, and to the more careful preparation of their juice. The best qualities are produced in the province of Treviso, in the Berici and Euganean Hills, between Vicenza and Padua, in some districts of the province of Udine, and above all in the province of Verona, well known for its *Valpolicella*, the best common wine in the kingdom.

There is no old wine in the country, except in small quantities, and in the hands of a few amateur proprietors. The wine of each vintage is sold in the course of the following year; and when any of it is kept, even though it should not have become, or shown a tendency to become, vinegar, it will sell at a lower price than new wine, because it is milder, and less agreeable to the taste of the consumer.

Previous to 1851 the annual quantity of wine produced in the kingdom, in average years, was 85,837,705 gallons, of which 52,823,203 gallons were produced in the Venetian, and 33,014,502 in the Lombard provinces. The produce of Lombardy not being sufficient for the consumption of its population, nearly 4,402,000 gallons a-year more were imported either from the Venetian provinces, which produced much more than was required for their own consumption, or from the neighbouring states of Modena, Piedmont, and the Papal territory, according to the respective local produce and prices. But since 1851, when the *oidium* attacked all the vines of the country, the produce has so fearfully diminished that in 1856 the government found it necessary to grant a reduction of the direct land-tax on lands chiefly cultivated with vines, in proportion to the ascertained amount of loss. The whole produce of Lombardy, in 1852, was reduced to 11,004,834 gallons, and that of the Venetian provinces, in 1854, to 7,538,311 gallons of wine. The respective loss of each province was as follows:—

Government of Milan.		Government of Venice.	
Gallons of Wine produced in—			
1838.	1852.	1847.	1851.
Mantua...10,347,405	3,439,077	Padova...10,454,592	2,531,112
Milan....3,800,585	998,975	Vicenza...9,904,350	1,320,580
Brescia...3,674,822	747,778	Udine....9,574,206	1,210,532
Pavia....3,264,430	651,112	Verona...8,583,770	660,290
Bergamo..2,732,434	1,247,090	Treviso...7,483,287	748,329
Como.....2,665,305	1,988,353	Rovigo...3,961,740	352,154
Cremona..2,663,170	1,981,750	Venezia...2,751,209	528,232
Sondrio...2,325,190	90,614	Belluno...396,174	187,082
Lodi.....1,962,910	964,464		
Total...33,436,251	12,109,213	Total...53,109,329	7,538,311

Potatoes, which form so important a part of the food of the inhabitants in the more northern parts of Europe, are

Lombok
|
Lomond,
Loch.

very little cultivated in Lombardy. They are almost exclusively confined to the Alpine districts, or, when grown on the level country, are confined to the gardens. The absence of this root is a subject of sincere regret to the most patriotic individuals who have devoted their attention to rural economics. Count Dandolo attributes much of the dreadful consequences which followed the deficient harvests of 1816 and 1828, when great numbers perished from want of common necessities, to the absence of that seasonable supply of food which potatoes would then have furnished. Others have made similar and ineffectual remarks. The taste for polenta is much too deeply rooted, and the dislike to potatoes so common amongst the working classes of the rural districts, that there is no present prospect of their cultivation being speedily extended.

It is generally believed that more than four-sixths of the inhabitants of Lombardy subsist wholly by the labours of the field. Of these, the far greater proportion are of the description which is here called colonists. They are small occupiers, dividing the trifling products of the soil with the proprietors. Their dwellings are small, their furniture and utensils scanty, and their dress of the coarsest materials. They generally marry early, and have families, though they have no prospect of supporting them, beyond the hope that the half of the produce of maize on a few acres of land may yield them food during the year, with the exercise of the greatest parsimony in its use. In the event of sickness, they have to resort to hospitals and charitable institutions. The charity of those who can afford it is bestowed with as fair liberality as can be expected, considering the numerous claimants that offer for its reception.

The mining operations are inconsiderable, and are confined to the procuring of iron in the Alpine valleys of Bergamo and Brescia, and of copper in Belluno.

The manufactures of the kingdom, with the exception of that of silk, which gives the most employment, and has already been referred to, are not extensive, but have of late

years been on the increase. There are 33 cotton-spinning mills, of the power of 728 horses, and turning, in the aggregate, 123,402 spindles. The cotton for their consumption is introduced from Asia and America. In 1854 they spun 7,412,160 lb. of cotton, of the value of L.264,718; 3810 persons, of whom 1482 were men, 1152 women, 506 boys, and 670 girls, found at these mills a daily employment, and received, on an average, each man from 1s. to 1s. 4d., each woman from 7d. to 8d., and each boy or girl from 3½d. to 6d. per day. Cotton-weaving machines in 1845 had 15,602 looms, which in 1854 had increased to 17,014. As they are chiefly carried on in a small way by families of the lower classes, they gave employment to 34,000 persons. Their produce is reckoned at an average value of L.544,948 per year. The woollen manufactures employ about 700 persons, but are comparatively insignificant. There are only 3 flax-spinning mills, which turn 11,518 spindles, and employ 330 men, 220 women, 64 boys, and 258 girls. Venice has long been known for its glass manufactures; the annual average exports of glass, pearls, and beads of the last ten years has been L.143,333, of which the largest items were,—L.25,000 to England; L.15,666 to Calcutta; and L.12,666 to France. Milan has been from remote times celebrated for its weapons and arms; and iron work of all kinds is still extensively made in the province. Besides the great branches of manufacture, most of the smaller ones are carried on, especially those of paper, glass, gold and silver articles, and domestic utensils.

The foreign trade is not material; and that of Venice has much declined since its union with Austria. There are still, however, many ships navigating the Adriatic and the Mediterranean Seas, now bearing the Austrian flag, which are built and equipped at Venice. But there is no reliable information as to the real present amount of imports and exports, and foreign trade in general; and such returns as have been published, being *very far* from correct, would only lead to erroneous conclusions. (* * *)

LOMBOK, an island in the Indian Archipelago, lying between S. Lat. 8. and 9., and E. Long. 115.40. and 116.40.; and separated by the strait of Lombok from the island of Bali on the W., and by that of Allas from Sumbhawa on the E. It is about 53 miles in length from N. to S., by about 45 in breadth; and has an estimated area of 1480 square miles. Two mountain chains extend along the N. and S. coasts inclosing a well-watered plain, which is laid out in rice fields. On the slopes of the mountains, maize and coffee are reared. In the northern mountain chain is a volcanic peak rising to the height of 12,380 feet. The rivers and streams are numerous; and along the coast are several excellent harbours and roads. The staple production is rice, which is cultivated with great care, and large quantities of which are exported. A considerable trade is carried on at Ampanam, its chief port. The capital of the island is Mataram. Pop. estimated at about 250,000. Lombok is claimed as a dependency by the Dutch.

LOMOND, LOCH, the largest and most celebrated of the Scottish lakes, separating the counties of Dumbarton and Stirling. It lies nearly N. and S., and is about 25 miles in length. The southern portion of the lake for nearly one-third of its entire length forms a wide basin of from 3 to 7 miles in width, and contains about 30 islands, several of which are well wooded. The northern portion is very narrow, averaging little more than a mile in width. The loch is deepest in the northern part, where it attains above 100 fathoms, but gets shallower as it expands towards the S., where its general depth is under 20 fathoms. The surface of the water is 22 feet above sea level. Many streams contribute to its waters from the surrounding up-

lands, the chief being the Endrick, which joins the lake at its S.E. angle, and the Falloch Water at its head. The only outlet is by the Leven, which joins the Clyde at Dumbarton, after a course of seven miles. This stream, however, has become much obstructed where it receives the waters of the loch, and consequently, after heavy rains, discharges the surplus with difficulty. It has been supposed that this is the main cause of the lake's surface having risen of late years above what was considered its natural level. Conspicuous among the scenery that beautifies the loch is the lofty Ben Lomond, which rises to the height of 3192 feet above the level of the sea. A steamer plies on the lake in connection with the Dumbarton Railway, which terminates at Balloch. It appears from old chronicles, that the shores of this lake were at one time very productive and thickly peopled. In 1263 the Norsemen under Angus, King of Man, after having ravaged the shores of the adjoining Loch Long, drew their boats over the neck of land which separates the two waters at Taret, massacred the inhabitants who had taken refuge in the islands, and set fire to the numerous villages they found on the shores of the lake. After this expedition, the loch came into the hands of some of the chief Highland clans, who long carried on their feuds here. Of these, the Macfarlanes and Macgregors are the most famous, from the sufferings they latterly endured at the hands of their more powerful neighbours. Estimated area of loch, 28,000 acres.

LOMONOZOF, MICHAEL WASITOWITZ, the father of Russian poetry and literature, was born in 1711, at a village near Cholmogory, in the government of Archangel. In his boyhood he assisted his father in his humble calling

Lomono-
zoff.

London. of a fisherman, and with the aid of a priest during the long winters, acquired the art of reading. The perusal of Polotski's poetical version of the Psalms, one of the few books he had, developed his genius for poetry, and excited in him a thirst for literary fame. Accordingly, repairing of his own accord to Moscow, he entered the Zaikonospaski Monastery, where he applied himself chiefly to the study of the learned languages. After a short interval spent at the University of Kiev, he removed in 1734 to the newly-instituted Academy of St Petersburg, where he devoted two years to mathematics and natural science. He was then sent, at the expense of the Academy, to study under Christian Wolf, at Marburg in Hesse-Cassel. Here, during his intervals of leisure, he perused the German poets, a study which he continued when after the lapse of four years he removed to Freiberg in Saxony, to acquire a practical knowledge of mineralogy and mining under Henckel. On his return to St Petersburg in 1741, he was elected an associate of the Academy. He was appointed in 1745 professor of chemistry; and in 1760 rector of the gymnasium and university. In 1764 he was honoured by the Empress with the title of counsellor of state. He died in April 1765, and was interred with great honour.

Lomonozof's multifarious labours comprise translations into Russian from several languages living and dead, and treatises upon meteorology, chemistry, criticism, rhetoric,

history, and chronology. He may be said by his grammar to have drawn out the plan, and by his poetry to have built up the fabric of his native language. Besides several odes and translations in verse, he wrote an heroic poem in two cantos on Peter the Great, a work said to be unsurpassed by any Russian poet. He also produced *Annals of the Russian Sovereigns*, and the *History of Russia from the Origin of that Nation to the Death of the Great Duke Yaroslav I.* The latter has been translated into German and French. The principal works of Lomonozof have been published in 3 vols. 8vo.

LOMSHA, or LOMZA, a town of Russian Poland, capital of a cognominal circle in the government of Augustovo, on the left bank of the Narev, a tributary of the Vistula, 94 miles N.N.E. of Warsaw. It is situate in a wooded valley, and contains some spacious and well-paved streets. The principal buildings are, an arsenal, a Piarist college, a gymnasium, and several churches and convents. The manufactures are chiefly confined to iron and paper. Pop. (1854) 5804.

LONATO, a town of Austrian Lombardy, delegation of Brescia, and 14 miles E.S.E. of the town of that name. It is situate on a height about 3 miles from the southern shore of Lake Garda, and is surrounded by walls, and further defended by a citadel. Here Bonaparte gained a victory over the Austrians in 1796. Pop. about 6000.

Lomsha
||
London.

L O N D O N.

(LATIN, *Londinium*; French, *Londres*; Italian, *Londra*), the metropolis of the British Empire, and one of the greatest cities of ancient or modern times, is situate on both banks of the Thames, about 45 miles above its mouth at the Nore, and 15 below the highest tideway. Though chiefly within the county of Middlesex, London includes parts of Surrey and Kent, and extends into Essex. St Paul's, the most striking object in the city, is in Lat. 51. 30. 48. N., Long. 0. 5. 48. W. of Greenwich.

In dealing with so important a subject, it will, perhaps, be expedient to treat shortly of its various branches in the following order, viz:—

I. Rise, progress, and present extent of London.

II. Number, occupations, and social condition of its inhabitants.

III. Religious worship and education.

IV. Parks, palaces, public buildings, and institutions.

V. Civic government, police, defence, representation, &c.

Origin.

Its early history is lost in obscurity, and the first authentic notice of its existence is that of Tacitus (*Annal.*, lib. xiv., cap. 3), who, in alluding to *Londinium*, says, "Cognomento quidem coloniae non insigne, sed copia negotiatorum et comaeatuum maxime celebre." The derivation of the name "London" has been the subject of much conjecture, but that mentioned by Pennant (*London*, p. 17) seems most feasible, viz., Llyn Din, from *Llyn*, in Celtic, a lake, and *din*, a town. It could not, however, have been a place of importance at the period of Julius Caesar's invasion, as it is not noticed in his *Commentaries*. About 100 years thereafter the Romans, under Claudius, took possession of the city, and called it *Augusta*, in honour of that prince. It was erected into a praefecture; and the inhabitants, nominally citizens of Rome, were governed by Roman laws and Roman magistrates.

London was not fortified at an early period of the Roman occupation; for in A.D. 61, the Britons under Boadicea revolted, captured and burned the city, and massacred the inhabitants. The city was soon, however, rebuilt, but is supposed to have remained open till the reign of Constantine the Great. From the number of coins of his time

found under the walls, it may be inferred that that emperor constructed the walls; and it is alleged that he made London an episcopal see. The limits of these walls have been pretty exactly ascertained. They commenced near the site of the present Tower, extended along the Minories and back of Houndsditch, across Bishopsgate Street, in a straight line, by London Wall, to Cripplegate; thence southward to Aldersgate, proceeding afterwards by the back of Christ's Hospital and Old Newgate, passing behind the site of Newgate Prison, and so reaching Ludgate; again proceeding westwards to the River Fleet, and terminating at a fort called afterwards Baynard's Castle. Their compass was completed by another wall along the bank of the Thames. Extent of the walls, from and to the side of the river, 2 miles and 1 furlong; on the bank, 1 mile and $\frac{1}{10}$ th; uniform height, 22 feet. Through gates in these walls roads led to different parts of the kingdom. The great Roman roads, Watling Street and Ermin Street, had their termini at the London Stone, or Roman Milliarium, a portion of which still remains, and is inserted in the most conspicuous part of St Swithin's Church, abutting on Cannon Street. The names of the gates are still preserved in streets, &c.—viz., Ludgate, Aldersgate, Moorgate, Bishopsgate, Aldgate, Newgate, Cripplegate, and Postern Row, on Tower Hill.

After the Romans withdrew their forces from England, London suffered severely till the Saxons fixed themselves in the country. It is said to have become then the capital of the East Saxon kingdom; at any rate, it quickly regained its former importance, and is called by Venerable Bede a "princely town of trade." Soon after the introduction of Christianity, Old St Paul's, and St Peter's at Westminster, were founded.

When the Saxon monarchies were united in the person of Egbert, London became the capital of the consolidated kingdom, and such it has continued to be. In the reign of Alfred it recovered from the effects of the Danish invasion, as well as from those of a fire, which nearly consumed it in 893.

After the battle of Hastings, the city submitted to Wil-

London. liam, who granted it a charter, still extant; and who commenced building the Tower of London in 1078. About this time the capital suffered severely and frequently by fires, especially in 1077 and 1086.

In the following reign it was visited by a hurricane and an inundation; the latter carrying away the first wooden bridge over the Thames. Henry I. granted a new charter to the city in 1100, restoring the privileges it enjoyed previous to the Conquest, and conferring on the citizens the right of electing their own magistrates. It is said that this document served as the model for Magna Charta. The population in 1141 was estimated by Peter of Blois at 40,000. The title of the chief magistrate was changed by Henry II. from Portreeve to Bailiff; and in 1191 he is called Lord Mayor in a document issued by the Court of Aldermen. In 1198 Richard I. committed the duty of fixing a national standard of weights and measures to the sheriffs of London and Middlesex. John, by several charters, conferred additional favours on the city; among others, the jurisdiction and conservation of the Rivers Thames and Medway; and the power of choosing sheriffs.

In 1221 the first stone of the present Westminster Abbey was laid by Henry III.; and in 1236 water was conveyed in pipes from the village of Tyburn to the city.

In 1258 and 1270 the city was visited by famine, and in 1348 by a species of plague, on all of which occasions it suffered grievously.

Under Edward I. London was first divided into twenty-four wards, each to choose common councilmen and an alderman. Edward II., in 1316, prohibited as a nuisance the burning of coal, then lately introduced, but his mistake was soon discovered and rectified. Under Edward III. the city received the perpetual right of magistracy over Southwark. In 1381 the citizens were alarmed by the insurrection of Wat Tyler, but this was soon suppressed. Street lamps were first used in 1416. In the wars of the Roses, London chiefly favoured the interests of the House of York; and after the battle of Barnet, in 1471, Edward IV. knighted the mayor, recorder, and twelve aldermen. This was the era of the first printing-press, constructed and worked by Caxton in Westminster Abbey; as well as of the erection of water cisterns and conduits in several parts of the city and suburbs.

In the reign of Henry VII., a disease called the "sweating sickness" carried off two mayors and six aldermen, with many citizens. Some considerable improvements were made in this reign, as well as in that of Henry VIII., to which the suppression of religious houses by the latter materially contributed; these giving way to schools, hospitals, and charitable institutions.

Thanks to the wisdom of Elizabeth, the prosperity of London rapidly advanced during her reign. The refugees from the Netherlands introduced numerous manufactures before unknown in England, and in this way conferred especial benefits on London.

By maps of the time of Elizabeth and James I., it may be seen that the chief part of London then consisted of Newgate Street, Cheapside, the Poultry and Cornhill, and the various streets and alleys leading from them to the Thames. Along the Strand, towards Westminster, were houses on both sides—those to the S., and abutting on the river, being the palaces of the chief nobility. The names of Salisbury, Norfolk, Buckingham, Arundel, Essex, &c., have been perpetuated in the streets now on the sites of palaces and gardens formerly belonging to these families. Spring Gardens formed a series of walks, with bowling-green, &c., extending from Charing Cross towards Whitehall Palace, whence to the Abbey there was a regular street. On the Surrey side, there were not ten buildings between Lambeth and the west foot of Blackfriars Bridge; but from that point a row of houses was continued to the Borough. Southwark then extended but a short distance along High Street; and there

were small scattered houses from Tooley Street to Horselydown. In the reign of James I. brick was introduced as a substitute for wood in London houses, and the streets were first paved with stones. The city was severely visited by the plague in 1604, and again in the reign of Charles I. During the civil wars, a majority of the corporation took part with the Commons, and the city treasury was of great service to their party.

After the Restoration London began greatly to revive; but a serious check was given to it by the last visit of the plague, which raged from June till the end of December 1665, and destroyed nearly a third of the population. This was speedily followed by the "Great Fire," which commenced 2d September 1666, lasted four days and nights, and in that time reduced to ashes five-sixths of the whole city within the walls. The ruins covered a space more than a mile long and half a mile broad; and the value of buildings and goods consumed was estimated at ten to twelve millions sterling. But though severe at the time, this visitation contributed materially to the improvement of the city. It was rebuilt on a more commodious plan by Sir Christopher Wren in about four years. From the time of its reconstruction, few stirring events occurred. The first stone of St Paul's was laid in 1675. The revocation of the edict of Nantes in 1685 brought to London many French Protestant families, who peopled Spitalfields, and introduced the manufacture of silk. The continued growth of the city in the reign of Queen Anne occasioned the act of 1711 for building fifty new churches, the cost being paid by a tax on all coals brought into the Thames. The streets were then first generally lighted; fire-engines were provided, and measures taken for watching the city. In her reign, Clerkenwell, Old Street, the lower part of Shoreditch, Marlborough Street, Soho, Bedford Row, Red Lion Square, and a district north of Holborn, were annexed to the metropolis.

In the reign of George I. some additions were made to London, chiefly to the north of Oxford Street and about Berkeley Square. In the reign of George II. some new parishes were erected, viz., St George's, Bloomsbury; St Ann's, Limehouse; St Paul's, Deptford; and St Matthew's, Bethnal Green. The River Fleet was covered, and a market built on it; Grosvenor Square, Westminster Bridge, and Great George Street were built; and roads were formed in several directions, the principal one skirting the northern part of the city from Paddington to Islington.

The accession of George III. gave a fresh stimulus to improvement and extension. A new bridge at Blackfriars, with handsome streets leading to it, and many new dwellings on the Surrey side, were erected. On the N.W. side the parishes of St Pancras and Marylebone were formed. At the same period the street pavement for foot passengers was first laid down, the kennels removed from the middle to the sides of the streets, and the numbering of houses introduced. The American war gave a temporary check to extension; but soon after the peace of 1783, the advance became more rapid than ever. Docks were constructed, the commerce of the city rapidly augmented, the ground near the water side was covered with buildings, and, westward, Bedford, Russell, and Brunswick Squares quickly sprung up. From the Regency in 1811, London advanced in extent and in elegance still more rapidly. Regent's Park was formed, and surrounded by handsome terraces; and within the last few years the extensive and fashionable districts called Belgravia and Tyburnia—the former to the south and the latter to the north of Hyde Park—have been created, and literally covered with houses of a high class. In 1851 there were 305,933 inhabited houses in the metropolis, and there are no less than 6300 streets enumerated in the *London Postal Guide* for January 1857.

London.

Recon-
struction
and growth
of London.

London. It is difficult to assign any distinct boundaries to the metropolis, as almost continuous lines of houses stretch like branches from the main trunk of London, to Chiswick, Kensal Green, Kilburn, Hampstead, Highgate, Stamford Hill, and Upper Clapton in Middlesex; Stratford and North Woolwich in Essex; Greenwich and Lee in Kent; and Dulwich, Norwood, Clapham, Wandsworth, and Putney in Surrey. These, too, are constantly increasing in length and breadth; the vacant spaces between distant lines of road being filled up with extraordinary rapidity. The circle formed on a radius of 4 miles from Charing Cross excludes a large portion of London; but its extreme length may be set down as 10 miles, and its breadth at about 6. There are

four divisions of the metropolis which, though rather vague, are pretty generally understood by Londoners,—these are, the City, the West End, Lambeth, and the Borough; the two first on the Middlesex, and the others on the Surrey side of the water. The city of London proper has an area of 725 acres, and contains 108 parishes,—97 within, and 11 without the walls. In its most limited sense, the metropolis includes the cities of London and Westminster, the parliamentary boroughs of Tower Hamlets, Finsbury, Marylebone, Lambeth, and Southwark. Annexed is an account of the population of the various cities and boroughs above mentioned, as ascertained by the different censuses, beginning with the first in 1801:—

London.

Boundaries
and divi-
sions.

Cities and Boroughs.	1801.	1811.	1821.	1831.	1841.	1851.
London City	156,859	120,909	125,434	122,863	120,702	127,869
Westminster ditto	158,210	162,085	182,085	201,842	219,930	241,611
Tower Hamlets Borough.....	184,568	237,487	291,650	357,246	419,730	539,111
Finsbury	134,616	167,130	201,731	259,123	265,043	323,772
Marylebone	97,642	126,566	174,354	240,294	287,465	370,957
Lambeth	49,886	76,806	108,565	160,563	197,412	251,345
Southwark	94,813	103,763	123,663	134,117	142,620	172,863
Total	876,594	994,746	1,207,482	1,476,048	1,652,902	2,027,528

The metropolitan district comprised within the bills of mortality includes, with the cities and boroughs embraced in the foregoing table, other integral parts of London, like Chelsea, Brompton, and Kensington; and the suburbs, such as Greenwich, Wandsworth, Hammersmith, Putney, &c. In this view, the area of the metropolis is 78,029 acres, comprising 186 parishes, and the present population may be estimated at upwards of 2½ millions. Annexed is an account of the population of this area at the date of each census, commencing with 1801:—

Years.	Population.	Years.	Population.
1801	958,863	1831	1,654,994
1811	1,138,815	1841	1,948,417
1821	1,378,947	1851	2,362,236

But many merchants and citizens, taking advantage of the easy access to the country afforded by the railways, occupy houses at such places as Kingston, Esher, Walton, Richmond, Twickenham, Staines, Windsor, Reigate, Brighton, &c., making daily journeys to and from the city, so that they and their families are not included in the foregoing account.

Situation
of London.

The situation of London, on the banks of a great tidal river, is also peculiarly favourable for a large city, in a sanitary point of view. The subsoil is partly clay (the London clay of the geologist). The valley of the Thames has a gradual ascent on the north side; and the south side, though below the level of spring tides, has been well secured against inundations by embankments. The air is temperate and rather dry than moist, and the health of the inhabitants has gradually but rapidly improved from the earlier part of last century, when the deaths were annually one in twenty of the population, whereas at present they are about one in forty.

Health,
mortality,
&c.

It may therefore be safely affirmed that, in proportion to its population, London is much more healthy than any other great city. The registrar-general and Board of Health, however, point out in their various reports to Parliament how much more salubrious are some parts of the metropolis than others. But London, comparatively healthy as it is, has been in times past, and is still, occasionally visited by pestilence. The great plague of 1665 and its ravages have already been mentioned; but at that period open drains and filthy habits were the order of the day. From the bills of mortality for 1665, it appears that 97,306 burials took place, of which 68,596 were those of victims to the plague; while the total baptisms were 9967.

In 1854 there were 84,885 births and 73,697 deaths in London; but the rate of mortality in that year was greatly increased by the cholera, no less than 11,661 persons having

died of that disease. This mortality from cholera, however, large as it appears, was less than that of 1849; the deaths in the latter being at the rate of 62, and in the former of 43 to every 10,000 persons living.

Annexed is a statement of the annual rate of mortality per cent in London and the whole of England during each of the five years ending with 1854:—

Deaths to 100 Persons Living.

	1850.	1851.	1852.	1853.	1854.
London.....	2.104	2.339	2.258	2.435	2.929
England.....	2.077	2.199	2.236	2.238	2.352

Fevers and pulmonary diseases are those most fatal in the metropolis.

In 1851 there were in London 3149 independent gentlemen, and there were also 4674 male and 22,284 female annuitants.

We extract from the population returns of 1851 and subjoin a classified statement of persons, distinguishing their sexes, employed in the chief trades and professions in the metropolis:—

Trades and Professions.	Males.	Females.	Total.
Bakers.....	11,580	543	12,123
Blacksmiths.....	7,807	23	7,830
Boatmen and bargemen.....	4,417	...	4,417
Booksellers, publishers, and bookbinders.....	5,285	293	5,578
Boot and shoe makers.....	30,855	7,168	38,013
Brewers.....	2,617	...	2,617
Bricklayers.....	13,919	...	13,919
Brush and broom makers.....	2,289	1,205	3,494
Butchers.....	9,586	...	9,586
Cabinetmakers and upholsterers.....	9,558	1,451	11,009
Carmen, carriers, and carters.....	8,656	41	8,697
Carpenters and joiners.....	23,453	...	23,453
Clerks (commercial).....	16,420	...	16,420
Cheesemongers.....	2,715	...	2,715
Coachmakers (all branches).....	4,948	81	5,029
Coal-heavers and labourers.....	4,020	...	4,020
Coopers.....	3,876	...	3,876
Curriers, tanners, and workers in leather.....	5,764	219	5,983
Dressmakers, milliners, and seamstresses.....	...	65,138	65,138
Drapers.....	7,466	958	8,424
Engine and machine makers.....	6,583	9	6,592
Fishmongers and fish-dealers.....	2,571	167	2,738
Gardeners.....	7,958	692	8,650
Green grocers.....	3,885	980	4,865
Grocers and tea dealers.....	7,853	698	8,551
Hatters and hat manufacturers (all branches).....	3,326	1,227	4,553
Jewellers, goldsmiths, and silversmiths.....	5,388	287	5,675
Law clerks.....	5,670	...	5,670
Masons, paviours, and stone-cutters.....	4,578	...	4,578

London.	Trades and Professions.	Males.	Females.	Total.
Merchants (general).....		2,871	7	2,878
Milksellers and cow-keepers.....		3,938	1,262	5,200
Painters, plumbers, and glaziers		15,369	...	15,369
Plasterers.....		4,378	...	4,378
Porters, messengers, and errand-boys		33,059	262	33,321
Printers.....		10,365	...	10,365
Saddlers, harness and collar makers		2,652	94	2,746
Seamen		11,857	...	11,857
Servants, domestic (general).....		32,928	165,195	198,123
Shipwrights and shipbuilders.....		3,273	...	3,273
Silk manufacturers (all branches); see also silk dyers.....		7,579	8,372	15,951
Stationers.....		2,389	490	2,879
Surgeons and other medical men (see physicians).....		5,079	...	5,079
Tailors.....		22,479	8,292	30,771
Tavern-keepers, publicans, and victuallers		6,912	979	7,891
Tobaccoists, and tobacco and snuff ma- nufacturers.....		1,513	478	1,991
Warehousemen and women		3,988	84	4,072
Watchmakers.....		4,847	...	4,847

Commerce. As one of the great occupations of its inhabitants, the commerce of London demands the first notice. The capital of a great empire, with immense wealth concentrated in it, having easy access, both by land and water, to all parts of the kingdom, and every facility of communication with foreign countries, London has become, with perhaps the single exception of New York, the greatest commercial city in the world.

Thames. The commercial growth and prosperity of London are especially to be ascribed to its great river-port, the Thames. This famous stream has its source within the borders of Gloucestershire, a little to the S.W. of Cirencester, and becomes navigable at Lechlade, 138 miles above London. It is first affected by the tide about 15 miles above the metropolis; but before reaching this point, it is swollen by junction with the Isis, Kennet, Coln, and Wey. The city corporation are the chief conservators of the river, and appoint a navigation committee, who superintend the towing-paths, bridges, water-courses, and whatever relates to the river, as far as a stone a little above Staines Bridge. Higher up, the supervision is divided between the city and a body chiefly composed of the landowners on both sides of the river.

The conservation of the river below London is also in some measure under the government of the City Corporation, but the Trinity House has concurrent jurisdiction, and no ballast can be raised without its authority. The appointment and control of pilots, the placing and repairs of landmarks and buoys to indicate the channels, and the establishment of floating lights, are also under the superintendence of the Trinity House. Close to London Bridge there is water sufficient for vessels of 800 tons burthen, and the legislature has placed the shipping of the port and their moorings under the direction of the harbour-masters nominated by the corporation, and approved by the Trinity House. The sinuosities, currents, and shoals in the river, and its varying depth, render the navigation rather intricate. The river pilots, who are a distinct class, conduct vessels to Gravesend, where they are relieved by the sea pilots.

Navigation of the river. Down to 1800, the commerce of London and the shipping interest suffered materially from the crowded state of the river, and the difficulties, delays, and abuses, connected with the berthing and mooring of vessels, and the landing and storing of merchandise. These evils led to the construction of the West India Docks, which were opened in August 1802.

West India docks. These, next to the Commercial Docks, the oldest in London, were formed in the gorge of the Isle of Dogs, on the Middlesex side of the river. They comprise an import and an export dock (communicating with the river at Blackwall and Limehouse), and a dock of nineteen acres for bonded timber.

The export dock, occupies about twenty-five, and the import dock thirty acres. The gates are forty-five feet wide, and admit vessels of 1200 tons. At the highest spring-tides the water is 24 feet deep; and within the docks there is sufficient space for 600 vessels of from 250 to 600 tons. The import and export docks are parallel to each other, but divided by stacks of warehouses. There are sheds for sheltering the goods; and the chief warehouses are capable of storing 170,000 hhds. of sugar, besides coffee and other tropical productions. The whole space occupied by these docks and warehouses is 295 acres.

The East India Docks at Blackwall now belong to, and East India are managed by the same company as the West India docks. Docks. They were commenced in 1803, finished in 1806, and were intended to accommodate the trade of the East India Company. They include an import basin of eighteen acres, an export basin of about nine, and an entrance basin of 2½ acres. The entrance lock is 210 feet wide, the width of the gates 48 feet, and the depth of water in the docks is never less than 23 feet. The extent of warehouse-room at these docks is comparatively small. The East and West India Docks are well inclosed and guarded, and the buildings are fireproof.

The London Docks, situate between Ratcliff Highway London and the Thames, were begun in June 1802, and opened in January 1805. They consist of two docks; the western covering twenty acres, and the eastern about seven acres. The latter is entered from Shadwell, and the former near Wapping Old Stairs, and also at the Hermitage. The whole can receive 500 vessels of from 200 to 800 tons. The entire space inclosed is seventy-one acres. The warehouses are very fine; the most extraordinary being that for bonded tobacco. The roof and pillars supporting it are of iron, and the whole building covers five acres of land, and is capable of containing 24,000 hhds.

The company is governed by a body of directors, of whom the lord mayor is one. The regulations to prevent fire and pilfering are as effectual as in the East and West India Docks.

St Katharine's Docks, situate between the London St Katharine's Docks and the Tower, were executed in a year and a half, and first opened in October 1828. The whole extent of the property is twenty-four acres, of which nearly one-half is included in the two docks, communicating by a basin. The entrance lock, near Irongate Wharf, is 180 feet long, and 45 feet broad, and admits ships of from 200 to 800 tons. The warehouses are very large and commodious, and the regulations and charges are similar to those of the other docks.

Victoria Docks, the last constructed, were completed in 1855. They are situate in the Plaistow Marshes, immediately below the East and West India Docks. The portion of this property appropriated by the Dock Company for their own purposes is about 200 acres, but the dock itself occupies but seventy-four, and affords 23½ feet depth of water. The entrance lock at Bow Creek is 300 feet long, and 80 wide. There is a half-tide basin of sixteen acres; and the available warehouse floor is stated to be upwards of eleven acres. The company have also acquired about an acre and a half between Thames Street and the river for the erection of an up-town warehouse. One object of the company is to withdraw from the Thames a portion of the large fleet of colliers which lie at anchor in the Pool, and seriously obstruct the traffic on the river.

On the other bank of the Thames, extending along the side of the river opposite Limehouse, and terminating nearly opposite the entrance to the West India Docks, are the Commercial, formerly the Greenland Docks, which existed in the seventeenth century. They are now of great extent, inclosing 120 acres, of which seventy are water, and were designed to receive vessels laden with timber, corn, and

London. other commodities more bulky than costly. These docks are entered by a basin near Dog-and-Duck Stairs, sometimes called the East Country Docks, and the main body of the water within is divided into six unequal parts.

Parallel to these is the Surrey Canal, having an inner and outer dock at its entrance in Rotherhithe, by which ships are received, and affording communication with the Croydon Canal.

The Regent's Canal was formed to save expense of cartage through London of articles brought by sea, and afterwards forwarded for consumption to the N.W. parts of the metropolis; and also to communicate with the Grand Junction Canal. The Regent's Canal passes from Paddington by a tunnel under Maida Hill to the Regent's Park, thence to Islington, under which it is carried by a tunnel three-quarters of a mile in length, and so on to Hoxton, Hackney, and Limehouse. It is 9 miles long, and is provided with twelve large locks.

It is not easy, within a moderate compass, to give even a sketch of the foreign commerce of London. It would be an epitome of that of the world. To the British capital are brought the products, natural and artificial, of all soils and all climates. It has in store whatever the ingenuity and industry of man in any part of the globe can spare to exchange for what his own country does not yield. We can, therefore, do little more than state the number and size of the vessels that belong to and frequent the port, and the value of the produce and manufactures of the United Kingdom exported from the same.

Account of the Number and Tonnage of Vessels belonging to the Port of London on 31st December 1855.

Description of Vessels.	Under 50 Tons.		Above 50 Tons.	
	Vessels.	Tons.	Vessels.	Tons.
Sailing vessels	617	21,303	1,870	663,899
Steamers	132	4,327	405	163,406
Total	749	25,630	2,275	827,305

Account of the Number and Tonnage of Vessels which have entered the Port of London from Foreign Countries and the Colonies, in each of the five years ending with 1855.

Years.	Vessels.	Tonnage.	Years.	Vessels.	Tonnage.
1851	10,341	2,170,322	1854	10,943	2,667,823
1852	9,986	2,160,157	1855	9,770	2,420,586
1853	11,763	2,594,113	...	...	...

Account of the Number and Tonnage of Coasting Vessels that entered the Port of London in 1855, distinguishing British from Foreign.

Description of Vessels.	British.		Foreign.	
	Vessels.	Tonnage.	Vessels.	Tonnage.
Sailing vessels	17,729	2,438,873	13	1,801
Steamers	1,297	411,444	1	105
Total	19,026	2,850,317	14	1,906

The conveyance of coals to London employs a great deal of shipping. They are chiefly brought from the north-eastern district of the kingdom, and are sold at the New Coal Exchange, lately erected in Lower Thames Street.

Account of the Number of Ships laden with Coal which entered the Port of London in each Year from 1845 to 1855 inclusive.

Years.	Ships.	Years.	Ships.	Years.	Ships.
1845	11,987	1849	12,074	1853	12,111
1846	10,488	1850	12,633	1854	11,857
1847	11,911	1851	11,765	1855	10,734
1848	12,267	1852	12,035		

Very large quantities of coals now reach London by means of the railways which centre in the metropolis.

Declared Value of British and Irish Produce and Manufactures exported from London to Foreign Countries and the Colonies in 1855 and 1856.

1855	L.20,915,512
1856	25,966,033

The commercial institutions of London are well adapted for business by their localities and regulations. The first object of importance to every ship, on its arrival in port, is the custom-house.

The present custom-house, opened in May 1817, stands in Lower Thames Street, with its principal and imposing front, 480 feet long, towards the river, and occupies the site of a similar but smaller one destroyed by fire in 1814, as a preceding one had been in 1718.

The long room is a noble apartment, 186 feet long, 60 broad, and of an appropriate height, with desks on each side for the several officers; the centre being left for such of the public as have business there. The other parts are distributed so as to suit the several branches of the office. The London customs establishment of clerks, tide-waiters, &c., amounted in 1856 to 2167; though, as but 1620 were required for all the other English ports, it would seem as if the numbers here were excessive.

Amount of Customs Duties collected in the Port of London in 1855 and 1856.

1855	L.11,625,125
1856	12,287,519

The Society of the Trinity House has its chief establishment in a large and handsome house on Tower Hill, built by Wyatt in 1793. It was incorporated in 1815; but from the terms of its charter, it evidently had a previous existence, and was then established at Deptford Strond. Its privileges were confirmed by the charter of 1658, and its members are now partly men of high rank, and partly those remarkable for naval knowledge and skill in maritime affairs. Its duties as to pilots, lighthouses, buoys, ballast, &c., have already been mentioned. In process of time this society acquired large property; the net revenue under its management having, in 1855, amounted to L.204,195. Until the passing of the act 13th and 17th Vic. c. 131, the society spent much of its surplus revenue in pensions to poor and disabled seamen or their widows and orphans; but this act transfers their revenue, as well as the charge for maintaining lighthouses, &c., to the Mercantile Marine Fund. It would appear, from a parliamentary paper lately published, that the Board of Trade expended in 1856 out of this fund L.1388 as rewards for the salvage of life.

The Trinity House contains some portraits of naval heroes, naval trophies, &c.

The Royal Mint, also on Tower Hill, was removed thither from the Tower in 1811. The present building, which is extensive and well suited to its purpose, was completed under the direction of Sir R. Smirke. The interior is appropriately arranged for the manufacture of coin; and the machinery combines great ingenuity and beauty. In consequence of the report of a commission in 1849, the old company of moneyers was abolished, and a scientific chief has since been allotted to this department, instead of a political one.

The amount of gold, silver, and copper money coined here in the last three years has been as follows:—

Account of the Total Value of Gold, Silver, and Copper coined at the Mint in each of the Three Years ending with 1856.

Year.	Gold.	Silver.	Copper.	Total.
1854	L.4,152,183	L.140,480	L.60,866	L.4,353,529
1855	9,008,663	195,511	41,091	9,245,265
1856	6,002,114	462,528	11,418	6,476,060
Total	19,162,960	798,519	113,375	20,074,854

London.
Bank of
England.

The Bank of England, one of the most attractive objects in the city, was founded by act of parliament in 1694, and its business was carried on for many years at Grocers' Hall. In 1733 it was transferred to Threadneedle Street, and soon thereafter the present hall and bullion office were opened. Between 1770 and 1788 the façade was extended, and two wings added, under the directions of Sir Robert Taylor and Sir John Soane. Under the superintendence of the latter, the front and wings of the original structure were harmonized. The area of the bank is an irregular quadrangle; the south or principal front is 365 feet, and the north 410; the east 245 feet, and the west 440. Its principal entrance is from Threadneedle Street, the other two from Bartholomew Lane and Lothbury. The interior contains several open courts, the rotunda, or circular room, numerous offices, committee-rooms, and private apartments for the residence of officers and servants. The business is carried on by a staff of about 800 clerks, &c., whose salaries amount to nearly £200,000. The bank has received nine successive renewals of its charter since it was first granted in 1694, and measures have been taken in parliament this session (the first of 1857) for again renewing it.

The act of 1844, still in force, separated the Bank into two distinct branches, viz.,—1. The Issue Department, devoted to its business as agent of the state in creating and issuing paper money, or bank-notes, convertible into gold on demand; and, 2. The Banking Department, where the private business of deposit and discount is carried on. (For an account of the Bank of England, see PAPER MONEY.)

Banks.

There are sixty private and twenty-eight joint-stock banks in the metropolis. Some few of the former, such as Child's, in Fleet Street, were established before the end of the seventeenth century; while the joint-stock banks are all the offspring of the last few years. There is an establishment near Lombard Street called the Clearing House, where a daily exchange of cheques or drafts on city bankers is effected, and this process tends greatly to facilitate banking business.

Royal Ex-
change.

The Royal Exchange, colossal in proportions, and occupying a commanding position between the Bank of England and Cornhill, is a spot where great mercantile transactions are daily concluded. The first exchange was built by Sir Thomas Gresham, completed in 1567, but destroyed by the great fire of 1666. It was, however, speedily rebuilt, and was opened on 28th September 1669. Again destroyed by fire in 1838, it was rebuilt, and completed in 1846 by Mr Tite. The present building is quadrangular, and the interior surrounded by arcades. In the centre, which is uncovered and unprotected from the weather, stands a statue of Her Majesty by Lough. The outside of the building, except the grand western entrance, is occupied by small shops; and on the upper floor is Lloyd's, where the business of marine insurance is conducted by underwriters. It has been estimated that, on an average, 200,000 persons daily visit the exchange, but this can be little more than conjecture. Merchants and brokers resort much to coffee-houses in the vicinity of the Exchange for the transaction of business.

Most of the larger transactions are negotiated by brokers, who in general confine themselves to one branch of trade, with which they are thoroughly acquainted. Thus we have colonial brokers, insurance brokers, ship brokers, stock brokers, bill or money brokers, &c.

Stock Ex-
change.

Near the Royal Exchange and the Bank is the Stock Exchange, where real and fictitious sales are made of property in the public funds, &c.; the latter for the most part being a species of gambling.

Manufac-
tures.

London, when compared with some of the towns in the north and west of England, can scarcely be called a manufacturing place; yet the various articles produced here employ many thousand persons. The silk manufacture especially

employs a large number of hands. Originally introduced by French Protestant refugees, many of their descendants still continue the trade, which employed, in 1851, 15,764 persons, of whom 8277 were females.

London.

The manufacture of London porter and beer is a much more lucrative business, but a London brewery requires a very large capital. Sugar-refining and clock and watch making also prevail to a considerable extent, the latter chiefly in a district called Clerkenwell. London-built carriages are generally considered the best, as they are undoubtedly the most elegant in the world. London enjoys a high reputation for the manufacture of numerous smaller articles, such as mathematical, surgical, and musical instruments, jewellery of the superior kinds, gold and silver plate, &c.

The great number of those employed in house-building proves that the metropolis is still rapidly extending; and though this business received a severe check during the late war with Russia, it was only temporary, as evinced by the general resumption of building in the various outskirts of London.

The shops in London are, generally speaking, well managed, and many of them are handsomely fitted up, especially those in Bond Street, Regent Street, and Oxford Street. The wholesale shops or warehouses are chiefly to be found in the city; the retail shops, particularly those on a large scale, being more general in the west or fashionable end of the metropolis. The bazaars in London, each of which forms an aggregation of shops or stalls, are not now so attractive as they once were. They deal mostly in fancy goods, furniture, toys, &c. The four great establishments of the kind are those in Soho Square and Baker Street, the Pantheon in Oxford Street, and the Pantechnicon in Halkin Street, Belgrave Square. The Burlington and Lowther Arcades contain many shops for the sale of the like commodities.

Table showing the Area in square miles, and the Population, of the Metropolis, the Number of Houses therein, and the Number of Families occupying the same in 1851.

Divisions.	Area in square Miles.	Houses.			Families, or separate occupiers of dwellings.	Population.
		Inhabited.	Uninhabited.	Build- ing.		
Part in Middlesex	61	213,279	10,613	3,046	395,703	1,745,601
Part in Surrey...	36	72,314	4,524	1,160	110,027	482,435
Part in Kent ...	35	20,310	1,506	609	27,850	134,202
Total.....	122	305,933	16,643	4,815	533,580	2,362,238

Account showing the Number of Persons over 20 years of age in the Metropolis in 1851, distinguishing the Married from the Unmarried.

Sexes.	Of the age of 20 Years and Upwards.			
	Total.	Bachelors and Spinsters.	Husbands and Wives.	Widowers and Widows.
Males	632,545	196,857	398,624	37,064
Females	762,418	246,124	406,266	110,028

In 1851 there were, as above stated, 305,933 inhabited houses in London. These for the most part are built of brick, though many of the private houses externally, such as those of the Duke of Sutherland, Lords Ellesmere and Spencer in the Green Park; the Duke of Wellington in Piccadilly, Lord Lansdowne in Berkeley Square, and Mr Holford in Park Lane, are either built of or faced with stone. But it is now very much the practice to cover the

Houses in
London.

London. brick fronts of houses with plaster or cement in imitation of stone; and though fastidious critics object to the fictitious character thus imparted to them, there can be no doubt that its effect is very good. Admirable specimens of this work may be seen in the magnificent façade of Carlton Gardens towards St James's Park, in Belgrave Square, Albert and Prince's Gates, Hyde Park, &c.

The upper class live principally in that part of London west of Regent Street, consisting chiefly of St James's, Berkeley, Hanover, Cavendish, Portman, Grosvenor, Belgrave, and Eaton Squares, and Park Lane, with the clusters of streets around them. This class, composed in great part of members of the legislature and their families and connections, and forming as a whole what is called the fashionable world, are resident in London for but the smaller portion of the year. Arriving in time for the beginning of the parliamentary session in February, they desert London at its termination in the end of July.

The middle class are scattered over all parts of the metropolis: their business being carried on for the most part in the districts east of Regent Street, they become migratory in the afternoon, some seeking the suburbs, and others living in the squares, terraces, and streets in such districts as Pimlico, Brompton, Bayswater, Portland Town, Camden Town, Holloway, Hackney, Peckham, Camberwell, Brixton, Clapham, &c. In the domestic arrangements of this class, speaking generally, the chief object is comfort; and this is the prevailing characteristic in the dwellings of merchants, tradesmen, and professional men of the metropolis.

The abodes of the poorer classes descend very rapidly in the scale from comparative comfort to downright misery. The skilled operative may manage to have a house of his own, but the more ordinary operative or the labourer must content himself with a lodging. These classes are pent up for the most part in such districts as Whitechapel, Bethnal Green, Southwark, Lambeth, Westminster, Chelsea, Paddington, Marylebone, St Giles, &c. It appears, from Mr Glover's *Report on the Lodging-houses of London* (January 1855), that there were then 10,284 common lodging-houses, more or less under the superintendence of the police—the estimated population of the same being 82,000. These are, of course, of the very lowest description,—miserable hovels,—yet much improved under the operation of the act of 1851 for their better regulation. Several benevolent societies, such as the Metropolitan Association for Improving the Dwellings of the Industrious Classes, are struggling to introduce a better taste among the poor, by building model lodging-houses for their use; but their utmost efforts must be quite inadequate to meet the requirements of the numbers whom they wish to serve.

In the *London Post-Office Directory* for 1857 are given the addresses of no less than 387 licensed hotels and taverns, and forty-three private hotels. The great hotels, such as the Clarendon, Mivart's, &c., are situate chiefly in the west end of London; and those at the stations of the Great Western, North-Western, and Great Northern Railways, are on a gigantic scale. Comfortable commercial hotels are scattered in great abundance throughout the other parts of the metropolis; and the old-fashioned inns are disappearing fast, or adopting the improvements and conveniences of the day.

The beer and gin shops are very numerous, the proprietors of such establishments numbering, in 1851, 7891. Large numbers of the working-classes dine in the beer-shops.

Markets.

It is difficult to form even a conjectural estimate of the consumption of each description of food in London. But calculating that, on the average, 3d. per diem for food be expended for each of the two and a half millions of inhabitants, the annual expenditure of its population under this head

will amount to L.11,406,250. The great provision market^s of London are ten in number, of which Mark Lane is confined to corn, the New Cattle Market at Holloway is the substitute for Smithfield Market lately suppressed, Billingsgate Market that for fish, Covent Garden that for fruit and vegetables, Leadenhall the principal one for poultry; and Newgate Market is chiefly for butchers' meat: the remaining five being of a more miscellaneous character. There are also numerous markets on a smaller scale. From these various sources the retail dealers and shopkeepers draw their supplies and distribute them to the inhabitants.

From different quarters we have gleaned the following estimates of the annual consumption of certain articles of London food. All, however, may be considered applicable to the period of the last census in 1851 :—

Wheat.....	1,600,000 quarters.
Bullocks	240,000 head.
Sheep	1,700,000 „
Calves	28,000 „
Pigs.....	35,000 „
Exclusive of large quantities of bacon and ham.	
Poultry.....	3,748,000 head.
Game, &c.....	1,807,000 „
Fish, wet and dry, of which more than half were herrings.....	
	450,180,900 lb.
Oysters.....	309,935 barrels.
Potatoes.....	310,464,000 lb.
Cabbages.....	89,672,000 „
Onions.....	1,489,600 „
Apples.....	725,500 bushels.
Foreign eggs	about 75,000,000
Milk, the produce of	13,000 cows.

Although London is supplied with many excellent springs of fresh water, they proved, centuries ago, quite inadequate to the wants of the citizens. As already mentioned, conduits were then adopted as a substitute. The first effort to supply water on a great scale was made in 1608 by Sir Hugh Myddelton,—a spirited citizen, who undertook, at his own risk, to convey a river of fresh and good water to the city. From this we may presume that in Myddelton's time the Thames no longer merited the eulogy of Stowe, that its "water was as cleere as that of the sea." In 1613 the River Lea water was let into the basin at the New River head at Islington, and thence, at the present day, the New River Company, with increased means, transmit the water through pipes to the houses, &c., supplied by them.

At present there are in all nine metropolitan water companies; but their supplies were much complained of as insufficient and unwholesome, especially during the prevalence of cholera in 1832, 1849, and 1854. Remedies have, as will be seen from the annexed table, been applied to the first of these evils, and there is now abundance for domestic purposes, besides a sufficient quantity from the street plugs for flushing the sewers regularly, and supplying the engines in cases of fire.

Thus, while 270,581 houses were daily supplied in 1850 with 44,383,332 gallons, it will be seen by the annexed statement that no less than 81,025,842 gallons were daily furnished in 1856 to 328,561 houses, leaving only about 12,000 houses unprovided by the water companies, within the bills of mortality. Great progress has also of late been made in providing a purer supply.

In consequence of the act of 1852, all water now drawn from the Thames for human consumption is taken at some point beyond the influence of the tidal wave, and so untainted by the impurities of London sewers. The result of a series of analyses of the water supplied by the various companies previous and subsequent to 1852, has been published by the Board of Health. From it we gather that the organic matter now contained in the water is comparatively trifling.

The establishment of public baths and wash-houses in various parts of the metropolis is an important improvement of recent date.

London.

London. Table showing the Extent of the Metropolis Water Supply in 1856, taken from Parliamentary Returns, prepared by the Board of Health.

List of Metropolis Water Companies.	Sources of Supply.	No. of Houses supplied	Gross Quantity supplied per Day.	Length of Mains and Branches.
			Gallons.	Miles.
New River....	River Lea, Chalk Springs, &c...	95,083	25,000,000	400 to 500 say 450
East London...	River Lea.....	70,000	16,000,000	331
Southwark & Vauxhall...	River Thames, at Hampton.....	41,529	10,331,122	432
Lambeth.....	River Thames, at Thames Ditton	28,541	6,109,000	206
West Middlesex	River Thames, at Hampton.....	25,732	6,895,368	178
Chelsea.....	River Thames, at Seething Wells.....	25,030	5,323,000	198½
Grand Junction.....	River Thames, at Hampton...	17,221	6,714,292	117
Kent	River Ravensbourne.....	16,077	3,500,000	124
Hampstead....	Ponds and Chalk Well	6,348	603,060	33½
Plumstead & Woolwich...	Chalk Well.	3,000	550,000	16
	Totals....	328,561	81,025,842	2,086

The average daily supply which, in 1854, was 164 gallons per house, amounted in 1856 to 246 gallons. The annual supply in the latter year would therefore exceed 29,574,432,000 gallons.

The liquid in London next in importance to water is porter or beer,—a malt liquor of great repute, and looked upon by the major part of the middle and lower classes as a necessary of life. The breweries where this beverage is produced are the largest manufacturing establishments in the metropolis; and the capital necessary for the maintenance of one of them, with its necessary appendages, such as public-houses for the sale of the porter, drays, horses, &c., is enormous. To give some notion of the extent to which this business is carried, we subjoin a table (the materials for which are borrowed from M'Culloch's *Commercial Dictionary*), showing the quantity of malt brewed in 1852 by each of the fourteen largest houses in London:—

	Quarters.		Quarters.
Barclay and Co.	112,494	Hoare and Co.	33,769
Truman, Hanbury, and Co.	124,416	Calvert and Co.	32,310
Meux and Co.	66,296	Mann and Co.	30,881
Reid and Co.	60,100	Charrington and Co. ..	26,366
Whitbread and Co. ...	53,236	Taylor and Co.	17,660
Combe and Co.	47,304	Goding and Co.	16,959
Elliott and Co.	36,222	Courage and Co.	16,014

The fuel used in London is almost exclusively coal. Annexed is an account of the quantities brought into London in 1851 and 1852, distinguishing the quantities sea-borne from those conveyed by railways and canals:—

	Coastwise.	Inland Navigation and Land Carriage.	Total.
1851.....	3,236,542 tons	254,421 tons.	3,490,963 tons.
1852.....	3,330,428 ...	414,917 ...	3,745,345 ...

Of course the consumption is materially affected by the severity or moderation of the winter season.

The general introduction of gas about 1820 wrought quite a revolution in the lighting of London; and unquestionably this city, as a whole, is better lighted than any other metropolis. There are in all sixteen gas companies, which share among them the business of supplying light of this kind to the street lamps, shops, and houses of the metropolis; and the estimated annual consumption in that way is about 6,000,000,000 or 7,000,000,000 cubic feet. It would be impossible to make any similar calculation with

London. regard to the consumption of candles, oil, &c. It may be added, that the use of gas in London for domestic purposes is not by any means universal, on account of its greater impurity here than in such places as Liverpool and Edinburgh.

Perhaps nothing proves more decidedly that the prudential principle is strong among the middle and lower classes of London than their extensive use of savings banks. The annexed table shows the number of depositors in the metropolitan establishments of this kind, and the amount of their deposits in 1854.

Number of Depositors in London Savings Banks on 20th November 1854.

In Savings Banks in—	Number of Open Accounts.	Total Amount due to Depositors.
		£ s. d.
Part of Metropolis in Middlesex	226,128	4,997,150 11 1
Do. do. Surrey.....	27,083	539,325 10 2
Do. do. Kent.....	5,883	160,704 1 2
Total	259,094	5,697,180 2 5

The first life insurance society in England was established here in 1766; and there are now (1857) no less than 225 insurance offices in London, of which upwards of 200 undertake the insurance of life. But it is not to be supposed that all these offices are equally trustworthy. The number of new offices that are projected every year, and the number that regularly expire within a similar period is convincing evidence that this business, if not overdone, is mismanaged, or tampered with to a considerable extent.

Remarkable as London is for its wealth, it has a large pauper population, necessarily a burden on their richer brethren. It will be seen by the following table that no less than 77,963 persons were in the various poor-law unions and other workhouses in the metropolis during the year ended 25th March 1856.

Table showing the Number of Paupers admitted into the Poor Law Union and other Workhouses of the Metropolis in the Year ended 25th March 1856, and the Number receiving Medical Treatment therein, and the Mortality during the same period.

Union Workhouses.	Number of Paupers admitted.	Number under Medical Treatment.	Deaths.
Part in Middlesex exclusive of St Pancras Parish*	61,768	31,075	3689
Surrey.....	14,428	5,084	1101
Kent	1,767	1,534	263
Total	77,963	37,693	5253

* No return made to Parliament by this parish.

The amounts received from poor-rates in the metropolis, and expended for the relief of the poor, in the years 1855 and 1856, were as follows:—

	1855.	1856.
Total amounts received from poor-rates.....	L.1,250,737	L.1,360,464
... expended for relief of poor.....	841,302	875,264

From other sources, such as alms-houses, soup-kitchens, and the miscellaneous charities with which London abounds, many poor people derive the means of existence, either wholly or partially; and an army of street beggars, of whom the majority are impostors, trade too successfully on the credulity of the benevolent. The Mendicity Society has done good service in exposing and punishing many of these cheats, but their business is too profitable to be easily surrendered.

London.
Criminals.

Taken as a body, the people of this great city are remarkable for their love of order; yet the amount of demoralization and crime is very large, though perhaps not out of proportion to the population and the temptation that exists in such a place to breach of the law. It is stated in the population tables for 1851, that there are in London upwards of 13,000 males and 18,000 females who have no stated occupation or ostensible means of existence, or, in other words, who live by malpractices. And the annexed account, applicable to 1856, will throw some light on the nature and probable frequency of the crimes and misdemeanours that are most prevalent among them:—

Nature of Offences.	Annual number taken into custody by the Metropolitan Police.*	Annual number summarily convicted or held to bail by Police Magistrates.	Annual number convicted and sentenced by Superior Courts.
Offences against the person ...	10,489	6,314	162
Offences against property, with violence.....	398	...	307
Offences against property, without violence	20,345	8,659	1856
Malicious offences against property	2,686	1,742	6
Forgery and offences against the currency	1,319	...	237
Other offences	38,003	16,736	19
Total	73,240	33,451	2587

* This account does not include offences committed within the city.

Table showing the Amount of Church Accommodation of all kinds in London on Sunday, 30th March 1851, for its Population of 2,362,236; and the Number of Persons who attended Public Worship on that Day:—

Places of Worship belonging to—	Places of Worship.	Sittings.*	Number of Persons Attending Public Worship.†			Places of Worship.			Sittings Available.		
			Morning.	Afternoon.	Evening.	Morning.	Afternoon.	Evening.	Morning.	Afternoon.	Evening.
Church of England.....	458	409,834	261,246	76,666	157,135	434	230	312	406,644	225,864	325,343
British Protestant Dissenters.....	554	250,970	165,750	16,690	137,799	510	148	502	245,284	77,096	237,769
Foreign Protestants.....	9	3,002	1,300	220	160	9	1	3	3,002	1,202	780
Roman Catholics.....	35	18,230	35,994	4,660	14,394	35	15	28	18,230	8,992	13,670
Other Christian sects	30	5,995	3,226	2,080	3,015	29	24	26	5,845	4,240	4,910
Jews	11	3,692	1,472	539	813	11	6	9	3,692	2,637	2,897
Total.....	1097	691,723	469,168	100,855	313,316	1028	424	880	682,697	320,031	585,399

* Number of sittings not returned for thirty-five places of worship.

† Number of attendants not returned for fifty-three places of worship.

There are numerous societies in London for the promotion of religious knowledge and morality. The chief of these are,—the Society for Promoting Christian Knowledge, founded 1698; the British and Foreign Bible Society, established in 1804, and encouraged by all religious denominations; the Society for Propagating the Gospel in Foreign Parts, established in 1701; the Religious Tract Society, instituted in 1799; the London Missionary Society, and the Church Missionary Society,—the former commencing its labours in 1795, and the latter in 1799.

Table showing the Number of Sunday Schools in the Metropolis in 1851, and the Number of Scholars attending the same; distinguishing the Religious Denominations under which they are maintained.

Denomination by which they are supported.	Number of Schools.	Number of Scholars.		
		Male.	Female.	Both Sexes.
Church of England.....	259	24,350	24,823	49,173
Protestant Dissenters.....	373	35,897	42,784	78,681
Roman Catholics.....	5	419	400	819
Congregations undefined ..	61	5,059	4,520	9,579
Unitarians.....	3	188	160	348
Total Sunday Schools...	701	65,913	72,687	138,600

Of the 73,240 persons taken into custody in 1856, 45,941 were males, and 27,299 females. Out of these large numbers but 375 males and 6 females are distinguished as having received superior instruction, while 8332 males and 7150 females could neither read nor write. Another portion, viz., 33,946 males and 19,594 females, either could read and were unable to write, or could read and write but imperfectly. The remaining 3288 males and 549 females were capable of reading and writing with facility. Among the 2587 who were convicted and sentenced by the superior courts, only 15 were found to belong to the better educated class. Thus, we may safely infer that a liberal extension of education to the poorer classes will operate in an inverse ratio on crime, and prove to some extent an economical measure. In farther confirmation of this conclusion, we may refer to the good already resulting from the establishment of metropolitan ragged schools, for those attending them are chiefly drawn from the class whose occupations go so far to swell the list of crimes and misdemeanours.

The number of churches in London has increased rapidly within the present century. Thus we find that the Church Building Commission had, in the interval between its formation in 1818 and 1856, when it merged in the Ecclesiastical Commission, built wholly or partly no less than 123 in the metropolis, and private endowments have been numerous within the same interval. Yet it will be seen by the annexed table, that for the population of London, 2,362,236 in 1851, there were at that time sittings (including places of worship of every kind) for but 700,000 or thereby.

Religious worship and instruction.

The education of the people has at length assumed its proper importance in the eyes of the public, and a minister of education has this year (1857) for the first time taken his seat in the House of Commons. It will be seen by the annexed table that there are in London 863 public and 3698 private day schools, exclusive of Sunday schools:—

Table showing the Number of Day Schools in the Metropolis and attendant Scholars therein in 1851, distinguishing Private from Public Schools, and the means by which the latter are supported.

Description of Schools.	Number of Schools.	Number of Scholars.		
		Males.	Females.	Total.
Public schools supported by taxation.....	41	4,768	2,213	6,981
Public schools supported by endowments.....	99	11,225	4,803	16,028
Public schools supported by religious bodies..	581	68,543	51,326	119,869
Other public schools.....	142	13,139	11,281	24,420
Total public day schools	863	97,675	69,623	167,298
Private day schools.....	3698	43,198	43,743	86,941
Total day schools.....	4561	140,873	113,366	254,239

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Yet the cost of education here is heavy, and a great many schools are but indifferently conducted. It would, however, be preposterous to attempt here any general description of those establishments, and it will suffice to allude shortly to those institutions connected with education which are of the highest degree, or that boast of great antiquity, wealth, or usefulness.

The University of London, established in 1836, consists of a body of government examiners, empowered, after due examination, to grant degrees in arts, law, and medicine, to the graduates of University and King's Colleges in London, and to several other proprietary establishments of a similar kind. The senate consists of upwards of thirty members, having a chancellor and vice-chancellor, and the business of the board, and the examinations at stated periods, are conducted in Burlington House, Piccadilly.

Schools of anatomy were first instituted in the metropolis about 1720, and now medical and surgical schools are attached to all the great London hospitals. Lectures are delivered during the winter by men distinguished in the profession, and the extensive and varied practice of the hospitals is thus combined with theoretical study. Examinations for licenses or diplomas to practise medicine are conducted by the College of Physicians in Pall Mall, and similar examinations with regard to surgery take place in the College of Surgeons in Lincoln's Inn Fields.

In May 1855, by order in council, a government commission was established for testing the fitness of candidates for situations in public offices. The office is in Deans Yard, Westminster.

University College, in Gower Street, opened in 1828, is an extensive, well-arranged, and handsome edifice. It is frequented by students of law, medicine, ancient and modern languages, &c. This college is open to all religious persuasions.

King's College, Somerset House, opened in 1831, is, like the rival institution last mentioned, a proprietary establishment, but is peculiarly attached to the Church of England, and instruction in religion here forms part of the course of education, which in other respects resembles that afforded in University College.

St Paul's School, St Paul's Churchyard, founded by Dean Colet in 1509, for the gratuitous instruction of 153 boys, was rebuilt in its present classic form, in 1823. The Mercers Company are the trustees of the institution and have the presentations. John Milton, and John, Duke of Marlborough were educated here.

Christ's Hospital (or the Blue-coat School), originally the house of the Grey Friars, founded in 1226, was turned to its present use in 1552, when, according to Stow, "after the erection of Christ's Hospital in the late dissolved house of the Grey Friars, a great number of poor children being taken in, a school was also ordained there, at the citizens' charge." (Stow, ed. 1633, p. 64.) Edward VI. in the same year granted the hospital a charter, and Charles II. attached a mathematical school, charging the exchequer with L.1000 per annum for its support. The governing body consists of the aldermen of London, governors *ex officio*, and contributors of L.500 each (formerly L.400) to the hospital funds, numbering in all, at present (1857), 512. The aldermen of the city have each an annual nomination, and the other governors have presentations as vacancies occur. Most of the children admitted are those of freemen of London, or of clergymen of the Established Church; and it has long since ceased to be what its founders intended—a charitable institution. A branch school is maintained at Hertford for younger children, including 70 girls; and the total average number constantly maintained and educated by the hospital in 1855 and 1856 was 1240, viz., 860 in the London establishment, and 470 at Hertford. They are well fed and taken care of, and warmly though fantastically

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clothed in the costume of the time of Edward VI. The buildings are old and irregular, except the great hall, completed in 1829, and which, fronting the opening lately made in Newgate Street, is one of the chief ornaments of the city. The revenue and expenditure are generally about equal; the former in 1855 being L.58,075, 17s., and the latter L.58,547, 4s. 6d. Camden the historian and Richardson the novelist were educated here.

St Peter's College, Westminster (better known as Westminster School), attached to the collegiate church of that name, or Westminster Abbey, was founded by Queen Elizabeth in 1560, for forty foundation or queen's scholars. Though originally a free school, it no longer bears that character, as the cost of education, board, and lodging paid for each of the queen's scholars is about L.45 a-year. Besides the master, usher, and scholars on the foundation, there are five other masters, two ushers, and many scholars, the latter varying in number from time to time. The queen's scholars are selected from the whole school for proficiency in studies. Eight of the queen's scholars are chosen after each examination, four of whom are sent to Trinity College, Cambridge, and four to Christ Church, Oxford. Ben Jonson, Dryden, Locke, and Gibbon were educated here.

Merchant Tailors' School, "one notable free grammar school," as Stow calls it, was founded in 1561 by the Company of Merchant Tailors. The first school perished in the great fire of 1666, and the present one was erected in 1675 on the same site in Suffolk Lane, Cannon Street. It is built of brick, and supported on the east by stone pillars, forming a cloister. The number of scholars is limited to 250, and presentations are in the gift of the members of the court of "Merchant Tailors" in rotation. After the annual examination, some of the scholars are invariably sent to the university; this school being endowed with 35 fellowships, 6 civil law, and 2 unrestricted exhibitions in St John's College, Oxford, 6 exhibitions to any college in Cambridge, and 4 exhibitions to either university. These 53 pieces of university preferment, besides smaller exhibitions, are invariably given to pupils educated at this school.

Gresham College, in Basinghall Street, rebuilt 1843, was founded by Sir Thomas Gresham in 1581, for lectures on divinity, civil law, &c., to be read gratis, at noon in Latin, and at 1 o'clock in English, during the term. The lectures on music and geometry are now delivered in the evening at 7 o'clock. This institution is not practically very useful.

The Charter House (corrupted from *Chartreux*) is situated in a square of the same name near Smithfield. Originally a house for Carthusian monks, founded by Sir Walter Manny, *temp.* Edward III., it shared the fate of other religious houses, *temp.* Henry VIII. After passing through several hands, it was at length bought in 1611 by Thomas Sutton, who converted his purchase into a school and an hospital for decayed gentlemen. The governors are 18 in number; the queen, her consort, and eldest son, gracing the list. At present (1857) this charity supports 44 scholars, and 80 decayed gentlemen. The Charter House has long held a high character as a classical school; and besides the boys on the foundation, there are numerous scholars receiving instruction here. Of those educated on the foundation, many receive exhibitions at either university; and the hospital, in its patronage of nine livings, gives the preference to those educated within its walls. Dr Barrow, Addison, Steele, Blackstone, John Wesley, and various other distinguished men, were Carthusians.

There are seven public parks in the metropolis, viz., Hyde Park, St James's, the Green, Regent's, and Victoria Parks. Parks on the Middlesex side, and Battersea and Kennington Parks on the Surrey side of the Thames. The oldest, largest, and most beautiful, are those in the west end of London.

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Hyde Park is entered from Piccadilly by a series of triumphal gates, and from Oxford Street by a marble arch, removed thither from Buckingham Palace. This park, of about 400 acres, is well wooded, judiciously intersected by walks and carriage roads, and ornamented by a piece of water called the Serpentine. During the season the long ride called Rotten Row is thronged in the afternoon by equestrians of both sexes. On the south side of the park, opposite Rutland and Prince's gates, stood the Crystal Palace of 1851. Adjoining this park, are Kensington Gardens, attached to Kensington Palace.

The Green Park, next to Hyde Park, is entered from Piccadilly by a triumphal arch, bearing an equestrian statue of the Duke of Wellington. The inner road that skirts this park is called Constitution Hill, and leads to Buckingham Palace, &c. This park is small, but very pretty, and the available space was extended in 1856 by the removal of the reservoir of the Chelsea water-works. St James's Park, first inclosed by Henry VIII. when he built the palace of that name, formed in olden times the pleasure grounds of Whitehall Palace, and was the favourite lounge of Charles II. At present (1857) operations are going on for reducing the depth of the pond in the centre, and for throwing a bridge across it to facilitate the transit of foot passengers from Westminster to Pall Mall. St James's Park is laid out with great taste, and contains some very fine trees.

Regent's Park is nearly circular, and consists of 450 acres laid out in walks and shrubberies, varied by water, and intersected and skirted by carriage roads. It is nearly surrounded by houses of the larger class, built in uniform terraces, and producing a good effect. In this park are the Zoological and Botanical Gardens, and the Colosseum stands on its eastern margin. The establishment of the Zoological Society, consisting of the gardens and a large and increasing menagerie, occupies ground in the north-eastern portion of the park, and was founded in 1826. These gardens form an instructive and agreeable promenade, and were visited by 344,184 persons in 1856. The gardens of the Botanical Society, in the centre of the park, are also attractive, and are frequently used for flower shows, promenades, &c. The Colosseum, erected in 1828 by Burton, is a sixteen-faced polygon, surmounted by a dome 120 feet in diameter, and presents in front a Doric portico of six columns. It has been used for panoramas, &c.; but the attractions of the place have long been on the wane.

Victoria Park, the eastern lung of London, consists of 290 acres, lying between Hackney Common and Duckett's Canal. It was formed under Act 14th and 15th Vict., c. 46., for the benefit of the crowded districts in its vicinity.

Kennington Park, formerly Kennington Common, belongs to the duchy of Lancaster, and was inclosed and laid out as a public park for pedestrians in 1852. It contains about 20 acres, and though yet in its infancy, forms a great boon to the inhabitants of Kennington, Vauxhall, &c.

Battersea Park, on the Surrey bank of the river, opposite Chelsea Hospital, Cheyne Walk, &c., is still incomplete; but as the new suspension-bridge leading to it will be opened this year (1857), it is presumed that the park will soon be finished. 320 acres of land were purchased for this park, but only 200 acres come within the park fence, the rest being allotted to houses, roads, &c. The grounds have been laid out, and are open to visitors; and an esplanade along the whole of its river front has been formed.

Palaces.

There is no palace in London of which, as an architectural work, the inhabitants have any reason to be proud.

Buckingham-

ham palace.

Buckingham Palace, however, from its cost and magnitude, and as the only town residence of the sovereign, commands attention. It stands on the site of Buckingham House, built by John Sheffield, Duke of Buckingham, on that of old Arlington House. This property was purchased by George III., and settled on his consort; and here all

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their children were born except George IV. In the reign of the latter monarch, a new palace was commenced by Mr Nash, but was not finished till near the end of the following reign, and was never occupied by William IV. The body of the palace now forms a parallelogram, containing an inner court; a fourth side, or grand front, looking towards the Horse Guards, having been added during the present reign. A still later addition of ball-room, &c., has been made on the south side; and, when the Pimlico improvements have been completed, the palace will stand within its own grounds. The internal arrangements of the palace on the ground floor strike the visitor as singularly mean and unworthy of royalty; the corridors especially being dark, narrow, and low-roofed. The rooms on the first floor, including the throne-room, drawing-room, &c., are well proportioned. The picture gallery, though small, contains very choice specimens of the Dutch and Flemish schools. The grounds behind the palace are prettily laid out, and the west side of the building, which fronts them, is much admired. The cost of this palace, before the late improvements were commenced, amounted to nearly L.700,000.

St James's Palace in Pall Mall, which, among diplomatists, St James' gives its title to the English court, is a long, straggling, and dingy building, and its appearance is still what Pennant styled it, "uncreditable."

It was built by Henry VIII. on the site of an hospital for lepers, founded previous to the Conquest, and it has been extended and altered frequently since his time. His daughter Mary died in this palace; and here Charles I. slept for the last time. Charles II. and the old Pretender were both born in it; and here the two first Georges kept their mistresses. The state apartments, which look towards the park of the same name, are spacious, and used exclusively for levees and drawing-rooms. The corridors and ante-rooms, however, are rather confined. Some portions of this palace are allotted to the members of the Cambridge branch of the royal family.

Kensington Palace stands in the parish of St Margaret's, Kensington, westward of Hyde Park, and between the ton palace. Kensington and Bayswater roads. It was originally built by Sir Heneage Finch, afterwards Lord Chancellor Nottingham; and his son sold it to William III. He and his queen, Queen Anne and her consort, and George II., were all partial to this place, and all died here. Queen Victoria was born, and her uncle, the late Duke of Sussex, lived and died in this palace. It is large and irregular, built at various periods, and of red brick. The principal entrance is on the west side; but the interior presents nothing of interest. Some of the rooms have been allotted as residences to dependants of the court; and a portion of the grounds to the west of the palace, formerly used as a kitchen garden, was, in 1841, subdivided and leased for building purposes, and is now nearly covered with large mansions.

The gardens to the east of the palace are open to pedestrians, and are the favourite resort of the inhabitants of western London. These grounds are extensive, and present a variety of surface in wood and water that renders them particularly charming. In summer a regimental band plays here twice a-week, and on such occasions Kensington Gardens are the gayest and most frequented promenades in the metropolis.

The new Palace of Westminster (of which Sir Charles Barry is architect) occupies the site, on the banks of the Thames, of the old Houses of Parliament, burnt down in October 1834. The new houses were commenced in April 1840, and are (1857) not yet finished. The palace, not having antiquity on its side, and having proved costly beyond all expectation, is perhaps more severely criticised than it otherwise would have been. But it has some defects which are too obvious to escape notice. The radi-

London. cal one is its want of elevation, and this is exaggerated by the length (900 feet) of the building, and the contrast formed by the gigantic height of the Great or Victoria Tower at the southern end, which is upwards of 300 feet.

On the river front, the only one completed, the richness of tracery and endless variety of minute and laboured ornament is astonishing to a close observer. Built of a Yorkshire stone, this front rests on a foundation of granite, and has a long terrace nearly on a level with high water. This, in consequence of an invasion of the Thames, is now protected and inclosed by a dwarf wall. The royal entrance to the palace is under the Victoria Tower, through an archway 65 feet high.

Westminster hall.

The most interesting entrance, through old Westminster Hall, does not properly belong to the new palace, but, from its proximity, has been easily appropriated as the main approach to both branches of the legislature. The majestic proportions of this fine structure are very imposing, and the historical associations connected with it give it additional interest. Here Sir William Wallace, Sir Thomas More, Wentworth Earl of Strafford, Charles I., and the rebel lords of 1745, were tried and condemned to death; and here Warren Hastings and Lord Melville passed through the ordeal of impeachment. This glorious relic of antiquity dates from the time of William Rufus. Walking to the upper end, and ascending the stair to the left, the visitor finds himself surrounded by statues of men eminent in the legislature of former days, such as Clarendon, Hampden, Falkland, Selden, Walpole, Chatham, Mansfield, and Fox. These are for the most part good, and all appropriate. This vestibule leads into the central or St Stephen's Hall, surmounted by a lantern tower. The hall is well proportioned, and decorated in unison with the rest of the building. Three other corridors centre in it; that to the right leading to the House of Lords, and the opposite one to the House of Commons; the third being the way to committee-rooms, offices, &c. On entering the House of Lords, the richness and profusion of the gilding and painting are apt to dazzle the eye; but perhaps this may be remedied when the whole is mellowed by lapse of time. The throne is especially gorgeous. The House of Commons is much plainer than that appropriated to the Lords.

The square clock tower, at the north end of the palace, is upwards of 300 feet high, and is all but completed. It has lately been furnished with an enormous bell, 16 tons weight, called "Big Ben," in honour of Sir Benjamin Hall, chief commissioner of works.

Lambeth palace.

Lambeth Palace, the London residence of the Archbishop of Canterbury, is situate on the Surrey bank of the Thames, almost opposite the Houses of Parliament. The property came to this see so far back as 1197, in consequence of an exchange with the see of Rochester. About 1250 great additions were made to the palace by Archbishop Boniface (of Savoy). Again, prior to 1443, Bishop Chicheley greatly improved it, and founded the Lollards' Tower, so called from its use as a prison for the early reformers of that name. Rings, to which they were chained, are still attached to the walls of a room at the top of this tower.

The palace was farther extended and improved by Archbishops Cranmer, Pole, Parker, and Laud; and Archbishops Bancroft and Abbot left all their books and MSS. to the incumbents of the see.

During the civil wars in the time of Charles I., Lambeth suffered severely, and the library was saved solely by the dexterous management of John Selden. The palace being in a ruinous state when Dr Juxon was appointed to this see after the Restoration, he did much to restore it, and added the noble apartment now used as a library. He and Archbishops Sheldon, Tenison, Secker, and Cornwallis,

made valuable additions to the collection of books, which now number from 20,000 to 25,000 volumes, with from 1200 to 1300 MSS. (See LIBRARIES.) During the incumbency of the late archbishop (Howley), important and costly additions, designed by Mr Blore, and completed in 1833, were made to the palace. The old banqueting-hall, with a fine oak roof, and the chapel, are both worthy of remark; and the palace is oak pannelled nearly throughout. Gardens of 12 acres are attached, but they are unpleasantly situated, and surrounded by houses of an inferior order. The site of the palace, too, is low, and must, from its proximity to the river, be occasionally damp and disagreeable.

Having already noticed those establishments in London, including the Custom House, which are chiefly subservient to the commercial intercourse between the metropolis and foreign countries, we proceed to mention the other public offices, &c., of most importance.

The offices of the first lord of the Treasury, the chancellor of the Exchequer, and of the secretaries of state for Foreign and Colonial affairs, are all in Downing Street, but their outward appearance would not challenge remark except of a depreciatory kind. The Privy Council Office, Board of Trade, Treasury, and Home Office, looking towards Whitehall, present on the contrary, a uniform and handsome front, erected a few years ago by Sir Charles Barry. Proceeding towards Charing Cross, the Horse Guards is the next building of note, and includes the offices of the Commander-in-chief, adjutant-general, quarter-master-general, &c. Behind it, in St James's Park, is the parade-ground for the guards. Then comes the Paymaster-general's office, not at all remarkable in an architectural point of view, and next to it the chief branch of the Admiralty, forming the head-quarters of the board and secretaries. The building has a lofty portico over the main entrance, with two wings projected to a screen fronting the street and inclosing a quadrangular court. The chief departments of the War Office occupy the house in Pall Mall formerly appropriated to the old ordnance department and other premises since acquired on either side.

Somerset House was erected for the most part in 1775-1782, by Sir William Chambers, on the site of a palace commenced by the Protector Somerset, and used as a royal residence by Queen Elizabeth and Charles II. It is one of the noblest features of London, contrasting most favourably in elevation and architectural and general effect with many other public buildings of the capital. It occupies a space upwards of 800 feet wide, and 300 deep, and forms three quadrangles, the central one being on a very large scale. The river front is a spacious terrace, to which a west wing, in perfect harmony with the main body, has just been added. The east end, a part of King's College, being of brick, and otherwise unlike the rest of this grand structure, slightly mars its effect as a whole. The front towards the Strand, and that just completed in Wellington Street, are of much smaller extent, but well proportioned. Somerset House is almost exclusively devoted to public offices, such as the Inland Revenue Department (employing in the metropolis alone in 1857 a staff of 900 officers), the larger branches of the Admiralty, the Audit Office, Office of the Registrar-General, &c.

The Post-Office, in St Martin's-le-Grand, is a gigantic establishment, and one whose arrangements must necessarily attract the most general attention throughout the empire. Considering the enormous extent of the national correspondence, the business of this department is conducted with wonderful correctness and celerity. The London establishment at present (1857) consists of about 590 clerks, and 2060 sorters and letter-carriers. There are also in the metropolis about 300 district and pillar post-offices.

London.

London. *Statement showing the number of Letters conveyed through the Post-Office from one district of London to another in each year from 1850 to 1855 :—*

Years.	Letters.	Years.	Letters.
1850.....	38,887,844	1853.....	42,816,314
1851.....	40,585,952	1854.....	46,191,569
1852.....	40,403,207	1855.....	45,844,963

The gross post-office revenue of the kingdom in 1855 amounted to L.2,716,420, and the net revenue to L.905,150.

Various plans for concentrating the majority of the great offices in Whitehall have been lately under consideration, and parliament has taken one step towards approving such a scheme by voting a sum for erecting a new foreign office.

East India House.

The East India House, in Leadenhall Street, was erected in 1726, but has been greatly enlarged. Its principal front, towards Leadenhall Street, built within the last thirty years, is 200 feet in length, having in the centre a portico of six Ionic fluted pillars, supporting a frieze with allegorical figures. It contains some fine apartments, especially the great court-room. The library is rich in books, and especially in MSS., illustrative of the history and antiquities of India. The old museum is filled with Indian curiosities of every kind; and this year (1857) another museum has been constructed, exclusively for exhibiting the varied products of the British Empire in the East.

East India Company.

The East India Company was formed in 1599, and chartered by Elizabeth in 1600. Its commercial character ceased in 1835; and it is now merely a political body, governing British India under the superintendence of the Board of Control. The Board of Directors of the India Company consists partly of nominees of the crown; but is in great part made up of representatives elected by the proprietors of India stock. The revenues of India, managed by the Company, amounted, in 1854-5, to L.27,312,235, and its expenditure to L.29,019,599.

Tower of London.

The Tower of London, so full of interest to all readers of English history, was commenced by William the Conqueror in 1078; and the Great, or White Tower, and the curious Norman chapel within it, still extant, were finished by his son, William Rufus, in 1098. Since that period nine lesser towers have been added. For many centuries this fortress was used as a palace and a state prison, and contained the chief mint of the kingdom; but it is no longer used for any of these purposes. The only portions to which the public are admitted, are,—the armouries; the jewel-house, containing the regalia and coronation plate; the Beauchamp tower, in which Lady Jane Grey was confined; and St Peter's church. The collection of armour is good, and the most remarkable specimens are pointed out and described to visitors by attendant warders dressed in the costume of the yeomen of Henry VIII's guard.

There are also within the precincts of the Tower a portion of the records of the kingdom in charge of the Master of the Rolls; the military store branch of the War Office; and a barrack built on the site of the grand store-house destroyed by fire in 1841, and usually occupied by a battalion of the Foot Guards. Very pretty gardens have taken the place of the old moat, drained as a nuisance in 1843. The well-known Traitors' Gate is situate about midway in the Tower wall which faces the Thames; and near it is the Bloody Tower, which, according to history and tradition, has deservedly earned its name. The spot on Tower Hill famous for executions, is opposite the western angle or bastion of the Tower.

The chief officers attached to this ancient fortress (now a fortress only in name) are the constable, lieutenant, and deputy-lieutenant. The Duke of Wellington held the first-mentioned office for many years previous to his death, and a statue to his memory stands near the White Tower.

St Paul's.

The cathedral church of St Paul's, inferior in size, but in some points superior in design to St Peter's at Rome, stands

on Ludgate Hill, the site of old St Paul's, as well as of previous churches. Old St Paul's, built, it is supposed, in 603, temp. Ethelbert, and afterwards extended and restored at various times, suffered frequently by fire, before its final destruction, with the greater part of the city, in 1666.

The first stone of the present cathedral was laid by Sir Christopher Wren, in 1675, and it was completed by him, after his own design, in 1710. It is cruciform, classic in style, and in effect singularly grand: the centre of the cross being covered by a dome of faultless proportions. It has frequently been remarked, that the whole of this edifice was reared under one architect, by one master mason, and during the incumbency of one Bishop (Dr Compton) of London, while the erection of St Peter's, by twelve successive architects, occupied 145 years. Undoubtedly St Paul's is similar in many respects to St Peter's, but it is not at all a servile copy; and though in miniature, when compared with the Roman temple, it forms a noble monument to the genius of its architect. The height of St Paul's, from the pavement of the churchyard to the top of the cross, is 370 feet; its length, from E. to W., 510; and width, from the entrance of the north to that of the south transept, 250 feet. The circuit of the cathedral is 2292 feet, the ground it covers upwards of 2 acres, and the whole is inclosed by a dwarf wall and railing. The west end, 180 feet wide, is ornamented by twelve Corinthian, supporting eight composite columns; and the outer portion of the whole is decorated by pilasters of these two orders. The north and south entrances are uniform and semicircular, and this is the shape of the eastern end. The whole is built of Portland stone, now much discoloured by time and London smoke; but this acquired tint, dark and varied as it is, seems to accord with the solemn dignity and grandeur of the church.

The interior of the cathedral is worthy of the exterior, and presents its most imposing aspect to a visitor entering from the west, and so approaching the choir. When the centre of the transept is reached for the first time, and he stands under the dome, feelings of wonder and delight cannot be restrained. The height and span of the dome convey at a glance the idea that this must be the sublime in architecture.

The simple grandeur of the interior is, perhaps, somewhat marred by the presence of monuments in a style of art scarcely worthy of such a place. The most important of them are those to Dr Johnson, and Howard the philanthropist; Lords Nelson and Howe; Sir Ralph Abercromby, Lords Rodney, Collingwood, Cornwallis, and Heathfield; Generals Moore and Picton, &c. The most appropriate monument is that over the entrance to the choir. It is a marble slab in honour of Wren himself, bearing an inscription ending with the words,—"*Si monumentum requiris circumspice.*"

The choir in which the service is daily performed contains a great deal of carved wood by Gibbons, and is furnished with an organ of powerful and fine tone.

In the crypt are the tombs of Nelson and Wellington.

By an inside staircase the visitor may reach a circular gallery within the dome, called, from an effect in acoustics produced by its shape, the "Whispering Gallery." The paintings by Sir James Thornhill, in the interior of the dome, illustrative of the life of St Paul, and cleaned and restored in 1856, may here be seen to advantage.

From hence the passage is short to the Stone Gallery, on the outside of the dome; and by a more difficult ascent, the Golden Gallery is gained. From this point, in clear weather, the view of the surrounding city and its environs is most comprehensive and striking. Above this gallery are the ball and cross, the former 6 feet in diameter, and capable of containing eight persons. St Paul's is the cathedral church of the see of London,—the most important

London. bishopric in the empire, the incumbent ranking next after archbishops, and enjoying an income of L.10,000 a-year. The revenues of the diocese, which includes the whole of Middlesex and parts of Surrey, Essex, and Kent, are estimated at upwards of L.30,000 a-year. The affairs of the cathedral are managed by a dean and chapter, consisting of four canons residentiary, four prebendaries, and other officers.

Westminster abbey. Westminster Abbey, the scene of so many important events, and so full of historic associations, claims even more minute attention than the sister cathedral. The accounts of its origin are nearly as vague and uncertain as those of old St Paul's. According to tradition, it originally stood on an island in the river, formed, it is supposed, by a branch of the Thames which inclosed parts of Pimlico and Westminster. At any rate, there is good reason for believing that the Abbey existed before the end of the eighth century. It was rebuilt by King Edgar, and extended and enriched by Edward the Confessor. The larger portion of Westminster Abbey, as it now stands, was built by Henry III., and completed in 1245. Like most cathedrals, it is in the form of a cross, though somewhat irregular, from the addition of chapels and cloisters at various times. The length of the Abbey, exclusive of Henry VII.'s chapel, is 383 feet; the extreme breadth at the transept, 203 feet; the height of the nave being 102, and that of the towers 225 feet. Henry VII.'s chapel, at the eastern extremity, is a gorgeous specimen of the Gothic architecture of his time. It was commenced in 1502, built by him as a burial-place for the royal family, and cost L.14,000. The Abbey subsequently suffered from neglect, especially after the suppression of religious houses, and during the civil wars of the seventeenth century. Soon after the Revolution, the whole was thoroughly repaired, and the western towers were added by Wren. Sir Christopher, however, could not shake off his innate love for classic ornament, with which, to the horror of the critics, he has liberally invested the Gothic towers.

The Abbey is much hidden by St Margaret's Church; but on approaching Victoria Street from Parliament Street, the buttresses and pinnacles, and whole expanse of this majestic pile, gradually open to view. The entrance to the north transept is much and deservedly admired, and convinces us that the wisdom of our ancestors in matters of architecture is not surpassed at the present day.

The interior is well seen on entering from this side, and still better from the western door. The stone screen separating the choir from the nave is modern, and designed by Mr Blorc. Beyond the high altar and further east, are nine chapels, the chief being those of Edward the Confessor and Henry VII. The first contains the shrine of that monarch, with, *inter alia*, the tombs of Henry III., and his son Edward I. Here, too, are preserved the sword of Edward I., part of his shield, and the Scotch coronation stone, brought by him from Scone in 1296. The chapel of Henry VII., beyond that of Edward the Confessor, forms the eastern extremity of the cross. It suffered by fire in 1803, but underwent a thorough repair between 1810 and 1822 at a cost of L.42,000. Chapters of the Order of the Bath were formerly held in this chapel; and on entering, the stalls and banners of the knights attract immediate attention. The next object in prominence is the highly decorated altar-tomb of the founder, bearing effigies of himself and wife. The flat stone ceiling, elaborately ornamented, is worthy particular notice. In and around this chapel are other monuments of interest, such as those to Mary of England; Mary Queen of Scots; Queen Elizabeth; George Villiers, Duke of Buckingham, assassinated by Felton; Monk, Duke of Albemarle; and of modern date, one to the Duc de Montpensier, brother to the late Louis Philippe, ex-King of the French. Many royal personages lying in the vaults beneath, such as Charles II., William

and Mary, &c., have had no monuments erected to them. In the other private chapels are many antique monuments and brasses.

In the south transept, in and near Poets' Corner, are monuments to the majority of our most illustrious poets, from the time of Chaucer to that of Campbell; and here, as well as in both aisles of the nave and choir, and in the north transept, the profusion of monuments almost bewilders the eye. The names of naval and military heroes, statesmen, historians, philosophers, divines, lawyers, painters, sculptors, musicians, actors, &c., attract one at every turn. The cloisters on the south side of the Abbey are in good preservation, and filled with monuments.

Service is performed daily, and on Sundays the Abbey is much frequented for public worship, though the sermons can rarely be heard by above one-third of those present.

The governing body of this collegiate church consists of a dean and chapter of eight prebendaries, &c. The property belonging to the Abbey being chiefly in the metropolis, is very valuable, and considerable sums are spent, and usually with good taste, in renovating and decorating this national temple.

Of the minor churches, the most remarkable, bearing date prior to the fire of London, are,—St Saviour's, Southwark, the Temple Church, the Savoy and Whitehall Chapels, and St Margaret's, Westminster.

St Saviour's, Southwark, formerly a priory, and one of London's oldest churches, is a most interesting fabric. It has three aisles running E. and W., and a cross aisle; and the columns supporting the roof are remarkably graceful. The Lady Chapel, restored in 1832, and at the east end of the church, is much admired. Gower the poet, Fletcher the dramatist, and Massinger, are all buried here—the first having a good monument in the porch.

The Temple Church, situate in the Inner Temple, is quite a gem of its kind, having been restored in 1842, at a cost of L.70,000, defrayed by the two societies of the Inner and Middle Temple. The entrance, by a very fine Norman arch, leads into the circular portion of the church, which dates from 1185, and is modelled from the Holy Sepulchre at Jerusalem. This part is peculiarly interesting from its form, its age, and the effigies of cross-legged and recumbent knights, that lie grouped on the floor. The inner portion of the church, built about 1240, is early English in style, rectangular in form, and the dark marble pillars which support the roof, are especially beautiful. Selden and Goldsmith were buried here.

Savoy Church, or St Mary-le-Savoy, near the Strand, is perpendicular in style, with a highly decorated and painted roof, and has many quaint monuments. It was built in the beginning of the sixteenth century, and was originally the chapel of an hospital for 100 poor men, founded on the site of old Savoy Palace by Henry VII., and dedicated to St John the Baptist.

Whitehall Chapel, opposite the Horse Guards, was the celebrated banqueting house, and is now the only remaining fragment of Whitehall Palace. This great work of Inigo Jones is 110 feet long, of hewn stone, adorned by an upper and lower range of pillars and pilasters of the Doric and composite orders. The interior is almost engrossed by one apartment of an oblong form, upwards of 40 feet high, with a ceiling painted by Rubens. It is now used as one of the chapels royal. Through one of the windows of this building Charles I. was led to the scaffold on 30th January 1649.

St Margaret's, Westminster, chiefly observable as impeding the view of Westminster Abbey, is also remarkable as the resort for public worship of the House of Commons on solemn occasions. It is of the time of Edward I., but has been repaired and renovated at various periods, and contains tablets to the memory of Caxton the printer and Sir Walter Raleigh.

London.

The churches worthy of notice, of a date later than 1666, are chiefly works of Sir Christopher Wren and his disciples, and belong to the Established Church. St Stephen's, Walbrook, considered by critics as the best of Wren's small churches; Bow Church, Cheapside; St Bride's, Fleet Street; St Stephen's, Holborn Hill; St Clement Danes, and St James's, Piccadilly, are all by the same hand. St Martin's-in-the-Fields and St Mary-le-Strand, by Gibbs, and St George's, Hanover Square, by James; and, of a later date, St Pancras New Church, by Mr Inwood; Marylebone New Church, by Hardwicke; St Luke's, Chelsea; and Miss Coutts' Chapel, in Westminster, are all worthy of attention. Of the 640 churches and chapels belonging to Dissenters, though they form the vast majority in the metropolis, few deserve remark on account of architectural beauty. The most striking exceptions, perhaps, are the cathedral-like building in Gordon Square, belonging to a sect calling itself the Apostolic Church, and the Roman Catholic cathedral, in St George's Fields, built by the late Mr Pugin, in the decorated style, though one side of the latter is nearly hidden by houses in the neighbourhood.

Inns of court.

Perhaps, of all the existing institutions in London connected with the law, the inns of court are the most interesting, partly from their antiquity and peculiar constitution and objects, and partly from their wealth and influence. The four great inns, or societies having the power to call students to the bar, are,—the Inner Temple, Middle Temple, Lincoln's Inn, and Gray's Inn. When these "voluntary societies," or aggregations of lawyers, originated, has not been exactly ascertained; but though not incorporated, they have "for ages submitted to government analogous to that of other seminaries of learning." (Lord Mansfield, quoted in Spilsbury's *Lincoln's Inn*.) These societies consist of three grades,—viz., benchers, barristers, and students. The oldest of these inns is the Temple, deriving its name from the religious and military order of the Knights-Templars, who founded it in 1185, and possessed it till the extinction of the order in 1311. In the reign of Edward III. the students of common law leased this property, and at length acquired it by gift from James I., who ordered that none should be admitted "into the society of any inn, that is not a gentleman by descent." The societies of the Inner and Middle Temple form two distinct bodies, having separate revenues and regulations; the Temple church, already described, being alone held in common. The whole of the very large property attached to the Temple, extending from Fleet Street to the Thames, except the gardens on the bank of the river, is covered with buildings, and these are divided into suites of apartments for lawyers, or others who choose to resort hither.

Lincoln's Inn lies chiefly between Chancery Lane and Lincoln's Inn Fields, and acquired its name from the inn or residence built here by Henry de Lacy, Earl of Lincoln, who died in 1312. This and part of the property of the bishops of Chichester, acquired in the time of Henry VII., constitute the present Lincoln's Inn. The Gothic chapel was built by Inigo Jones; but he, like Wren, seems to have succeeded best in classic architecture. The hall of the society a magnificent structure, 120 feet long, in the Tudor style, was completed by Hardwicke in 1845. The library attached to the hall contains a large and very valuable collection of books and MSS. Among the eminent men who once studied at Lincoln's Inn may be mentioned Sir Thomas More, Oliver Cromwell, Sir Matthew Hale, Lord Mansfield, Pitt, Perceval, and Canning.

Gray's Inn, the last of the four chief inns, is entered from Holborn, and stretches along Gray's Inn Lane. It was the property of the Lords Gray of Wilton in 1505, when it was sold, and afterwards vested in the prior of Sheen, who granted a lease of it to the students of law, renewed by Henry VIII. after the Reformation. The

hall and chapel are not remarkable, but the gardens are spacious and well kept. Lords Burleigh and Bacon were of "Graie's Inn." In 1850 the members of the four inns of court numbered upwards of 4000. Attached to the four great inns are nine smaller ones,—viz., Clifford's, Clement's, Lyon's, New, Strand, Furnival's, Thavies', Staple's, and Barnard's Inns.

London.

The chief courts of law are held partly in Lincoln's Inn, Courts of law, &c. and partly in a building attached to the west side of Westminster Hall, already alluded to as the grand vestibule to the Houses of Parliament. In the latter, several doors on the right lead to the Courts of Queen's Bench, Common Pleas, and Exchequer, of the Chancellor, Master of the Rolls, Lords Justices of Appeal, and Vice-Chancellors. But it is proposed, in completing the Houses of Parliament, to sweep away this building as inconvenient, and as an unsuitable architectural adjunct to Westminster Hall. The new site for the courts has not yet been definitively settled. In vacation, the Chancellor sits in the Old Hall, Lincoln's Inn, and the Master of the Rolls in Rolls' Court, Chancery Lane. The civil law courts,—viz., the Ecclesiastical and Admiralty,—are held in Doctors' Commons. The chief ecclesiastical courts are,—the Prerogative Court and the Court of Arches; and under the superintendence of the former is the registry of wills for the province of Canterbury. At present (1857) there are bills before Parliament to alter and limit the jurisdiction of these courts. The Court of Admiralty decides all cases as to capture of ships, disputes between masters and sailors in merchant ships, &c.

The inferior courts are those of Bankruptcy in Basinghall Street, the Insolvent Debtors' Court in Portugal Street, the Duchy Court of Lancaster in Lancaster Place, the courts of the lord mayor, and of the sheriffs, &c. There are also attached to the metropolis ten of the new county courts for the decision of claims under £50; and the committee of county court judges, established in 1856, act as a court of appeal.

The principal, or Central Criminal Court, is that held at the Old Bailey, its jurisdiction being a circle of ten miles round St Paul's. Nominally the lord mayor presides in this court, but the prisoners are for the most part tried by the judges of the Courts of Queen's Bench, Exchequer, and Common Pleas, and a few by the recorder or common serjeant of the city. Inferior offences are tried before the assistant-judge at the Middlesex Sessions House. The lord mayor sits at the Mansion House, and one of the aldermen at Guildhall, to judge in smaller matters, and there are besides eleven other metropolitan police courts beyond the limits of the city. The magistrates of these thirteen courts have the power to punish by fine and imprisonment for disorderly conduct, and for minor offences, to inquire regarding crimes of the highest nature, and to send prisoners for trial to the Central Criminal Court.

The College of Physicians in Pall Mall and Trafalgar Colleges of Square was founded in 1518, and the present is the third physicians building occupied by them since their institution. It was and surgeons built by Smike, opened in 1825, and contains some interesting portraits of eminent physicians, such as Harvey, Sir Thomas Browne, Garth, and Sir Hans Sloane, with busts of Drs Mead, Sydenham, Baillie, &c. The college consists of fellows and licentiates; and to the examinations conducted here we have already adverted.

The College of Surgeons in Lincoln's Inn Fields was erected by Sir Charles Barry in 1835, and contains the celebrated Hunterian Museum, purchased by the government, and entrusted to the college. Admission is obtained by an order from a fellow. This college originated in the Company of Barber Surgeons, chartered in 1461.

Chelsea Hospital, for maimed and superannuated soldiers, Chelsea is supported by government, and is similar in its origin hospital and objects to the twin establishment at Greenwich for

London. sailors. Chelsea College, partially built in the time of James I., by Dr Sutcliffe, dean of Exeter, was intended for a polemical school of divinity, but this having proved a failure, the property fell to the crown. It was granted by Charles II. in 1667 to the Royal Society, but reconveyed to the crown in 1682 for L.1300. An hospital, or infirmary, for old or wounded soldiers was commenced by Wren in that year, and completed in 1690 at a cost of L.150,000. It is of brick, with stone quoins, having a front of 790 feet, and walks and gardens upwards of 40 acres in extent. The main building forms three sides of a quadrangle, in the centre of which stands a bronze statue of Charles II. The principal portion of the front is devoted to the chapel, hall, &c., and the two remaining sides are occupied by pensioners (538 in 1856), who are well clothed, lodged, and fed. The out-pensioners, a far larger body, numbering 59,987 in 1856, are scattered all over the kingdom. Near the hospital is the Royal Military Asylum, opened in 1803 for the maintenance and education of the orphan children of soldiers. It consists of a normal school for training regimental schoolmasters, and of model and infant schools; and the boys, of whom there are at present 479, are trained to military exercises and trades, and are dressed in uniform.

Benevolent
institutions.

Among the most important of the benevolent institutions are those for the cure or alleviation of disease or external injury, such as hospitals, infirmaries, dispensaries, &c. Of these there are no less than 177 enumerated in the *London Post-Office Directory* for 1857.

St Bartholomew's Hospital in West Smithfield was originally founded in 1102 by Rahere, prior of St Bartholomew, and refounded in 1547 by Henry VIII. It was rebuilt in 1720 by voluntary subscription, and is well supported. The establishment makes up nearly 600 beds, and the average number of outdoor and indoor patients annually relieved is upwards of 70,000.

St Thomas's Hospital in High Street, Southwark, was founded by the prior of Bermondsey in 1213, and refounded by Edward VI. Rebuilt by voluntary subscription in 1693, and extended in 1752, it was again partially rebuilt in 1836. It consists of eighteen wards, possesses about 480 beds, has a revenue of L.25,000 per annum, and, on the average, annually affords assistance to upwards of 45,000 in and out patients.

Guy's Hospital, a near neighbour of St Thomas's Hospital, owes its existence to Thomas Guy, a bookseller, who built it and left at his death, in 1724, L.219,499 for its support. Again in 1829, Mr Thomas Hunt bequeathed to this institution L.200,000. Its ample resources are turned to good account. Here are 544 beds, which are filled every Wednesday morning by applicants whose cases appear the most urgent. There is a separate lying-in charity supported by this hospital, where 1755 cases of confinement were attended in 1856.

To this class belong also,—Westminster Hospital, Broad Sanctuary; St George's Hospital, Hyde Park Corner; London Hospital, Whitechapel Road; Charing Cross Hospital, West Strand; Middlesex Hospital, Charles Street, Regent Street; Royal Free Hospital, Greville Street, Hatton Garden; Metropolitan Free Hospital, Devonshire Square, City; King's College Hospital, Portugal Street, Lincoln's Inn; University College Hospital, Gower Street; St Mary's Hospital, Cambridge Place, Edgeware Road; and the Scamen's Hospital, on board the "Dreadnought," off Greenwich. To the great majority of these institutions are attached medical schools, where lectures, delivered by those eminent in the profession, and illustrated by practice, are available for an almost unlimited number of students.

There are, again, establishments devoted to the cure or relief of particular diseases, such as the hospitals for consumption in Brompton, the City Road, and Victoria Park; for small-pox, in Upper Holloway, &c.; for diseases

of the eye, in Finsbury, Chandos Street, Charing Cross, and Burlington Gardens; besides hospitals for the treatment of cancer, the Lock Hospital, &c.

The lying-in hospitals, too, are very numerous; and there are eleven asylums, &c., for the relief of the blind, and deaf and dumb. The Foundling Hospital, founded by Captain Coram, and incorporated 1739, though not now a charity for foundlings, maintains and educates 500 poor children. Of the lunatic asylums, besides those in the suburbs, the chief is,—

Bethlehem or Bedlam Hospital, which originated in the priory of St Mary of Bethlehem, founded for lunatics in 1247. Removed from its original site to Bethlehem, without Bishopsgate, it was given by Henry VIII. to the city in 1545; and, after being again moved to a new site in Moorfields about 1675, it finally was planted in its present position in St George's Fields in 1814. The front of the hospital is magnificent, extending to 697 feet,—the centre being surmounted by a dome and supported by six Ionic columns. The interior is well arranged, warmed, and ventilated; and having been gradually extended down to the present day, it is now capable of receiving about 500 patients.

St Luke's Hospital, a similar institution, more especially devoted to incurables, is situate in Old Street, having been brought hither in 1752 from Windmill Hill, where it was first instituted in 1732.

The numerous institutions for rearing and educating poor children are alluded to elsewhere. Of the infinite number of miscellaneous charities may be mentioned,—the Royal Literary Fund for the relief of poor authors and their families. The fund consists of L.30,000 funded property, and L.200 a-year derived from land, besides subscriptions. The Royal Humane Society, for rewarding those who assist in the preservation of drowning persons, and for resuscitating the latter; the Society of Friends of Foreigners in Distress; the Society for the Relief of Persons Imprisoned for Small Debts, by which 263 poor prisoners were discharged in 1855; the Magdalen and Guardian Asylums for prostitutes; the Society for the Suppression of Vice; and the Society for the Prevention of Cruelty to Animals.

Since the introduction of printing, London has always been the chief resort of the literary men of this country, as well as the head-quarters of the bookselling trade. Now, more than ever, it is the centre of English literary circles, the periodicals, exclusive of newspapers, being almost entirely confined to the capital. Its newspapers, too, excel in ability, information, and circulation, any others in the world. We subjoin a statement showing the number of periodical publications produced in London in January 1857:—

	Number.	Price per Copy.
Daily newspapers.....	16	1d. to 4d.
Newspapers issued thrice per week.....	6	1d. to 5d.
Ditto issued twice a-week.....	4	3d. to 1s. 4d.
Ditto once a-week.....	86	1d. to 1s.
Ditto at more distant intervals.....	24	3d. to 1s. 6d.
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Total newspapers and stamped publications.....	136	
Weekly magazines, and weekly issues of serial works.....	46	0½d. to 1s.
Monthly magazines, &c. do.	335	0½d. to 10s.
Quarterly reviews, &c. do.	57	1d. to 7s. 6d.
Transactions of various societies.....	26	2s. 6d. to 40s.
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Total.....	464	

Besides these there are numerous works published once or twice per annum, and of these the most worthy of remark is *Kelly's London Post-Office Directory*, an enormous octavo, issued regularly in November and March.

Many books have been published regarding London, but few of them are remarkable. Stow's *Survey of London*,

London.

first published in 1598, and since improved by Strype, &c., (in 2 vols. folio, 1754), is the most famous. The works of Maitland and of Pennant are also good. In the *Handbook to London*, of 1850, Mr Peter Cunningham has amassed a very large amount of information of the most entertaining kind regarding the antiquities of London; and Mr Henry Mayhew, in his work on *London Labour and London Poor*, has collected a wonderful amount of curious matter and statistics on his branch of the subject. But a good and comprehensive work on London, applicable to past and present times, is much wanted, and would, if well executed, form a valuable addition to English literature.

British
museum.

The British Museum, in Great Russell Street, Bloomsbury, has been established for upwards of a century; old Montague House, in which it was first deposited, having been purchased by government from Lord Halifax in 1753. The present building, erected 1823-47, from designs of Sir R. Smirke, stands on the site of the former one. The nucleus of this noble national museum was formed by the collections of Sir Robert Cotton and Sir Hans Sloane; the former acquired in 1700, and the latter purchased by government for £20,000 in 1753. The Museum has since been enriched by the following, among other acquisitions:—the Harleian MSS., purchased in 1755; the Royal Library, presented in 1757, by George II.; the Lansdowne, Hargrave, and Burney MSS., purchased between 1806 and 1818; the noble Library of George III., presented by George IV. soon after his accession, and that of the Right Hon. Thomas Grenville, devised by will, and transferred to the Museum in 1846.

The collection of antiquities is magnificent, consisting of,—1. The Egyptian antiquities, including the trophies of the Egyptian expedition of 1801, presents from various noblemen and gentlemen, and purchases, especially from the collections of Lord Belmore, Mr Henry Salt, and Signor Anastasi. 2. The Elgin marbles, containing the best specimens of Grecian art, purchased for £35,000. 3. The Phigaleian frieze. 4. The Towneley, Greek, and Roman marbles. 5. Sir William Hamilton's Greek and Etruscan vases. 6. Richard Payne Knight's fine collection of coins and medals, with the bequest of Rev. C. M. Cracherode, and the donations of Lady Banks and Mr W. Marsden.

The last great additions, and perhaps the most interesting, are the Nimroud marbles, collected from the ruins of Nineveh and Babylon by Mr A. H. Layard.

The collections of natural history are also extensive, especially in mammals, birds, and insects; while the mineral department contains the choice cabinet of Fulke Greville, with numerous additions, and a very fine assemblage of organic remains.

The governing body consists of *official* trustees, or personages high in the government, church, law, &c.; *family* trustees,—two of the Cotton family, two of the Harley, two of the Sloane, and one each of the Towneley, Elgin, and Knight families; and fourteen elected trustees, all eminent men.

From 7th May to 1st September, the Museum is open to the public from ten till six o'clock on Mondays, Wednesdays, and Fridays; closing at four o'clock from 1st November to 28th February; and at five o'clock during the rest of the year. Access to the reading-room (now, 1857, on an enlarged scale) attached to the library may be obtained by written application to the librarian, who issues tickets of admission available for six months. (See LIBRARIES.)

The number of visitors to the Museum in 1855, was 334,089 (in 1850, 2,527,216); the number of visitors to the reading-room being, in 1855, 53,567.

The annual expenditure of the Museum trustees is about £60,000, which is chiefly defrayed by the public.

The Geological Museum in Jermyn Street, a branch of the Government Department of Science and Art, is also open to the public. It contains specimens of British mien-

erals, raw and manufactured; and lectures are delivered here on mining, metallurgy, &c. London.

Though not open for general inspection, access may easily be obtained to Sir John Soane's Museum in Lincoln's Inn Fields, and that of the United Service Institution in Whitehall Yard, and they both merit a careful examination.

Exclusive of the government institutions for the promotion of science and art, there are many voluntary associations having the same object. Of these, the first in rank and antiquity is—

The Royal Society, Somerset House, incorporated in 1663, and well known from its *Philosophical Transactions*, published since 1665. The Society of Antiquaries, founded 1707, has also apartments in Somerset House. Its researches have been given to the public in *Archæologia*, first published in 1770. The Society of Arts, John Street Adelphi, established in 1754 for the encouragement of arts, manufactures, and commerce, was incorporated in 1846; and with a kindred object arose the Great Exhibition of 1851 and its Crystal Palace.

There are also, among many more, the following, bearing names indicating their character and objects:—The Medical Society, established 1773. Linnæan Society, founded 1785, and incorporated 1802. Horticultural Society, established 1804, and incorporated 1808. Medical and Chirurgical Society, established 1805. Geological Society, established 1807, incorporated 1826. Astronomical Society, established 1820, incorporated 1831. Asiatic Society, for research into eastern literature, founded in 1823. Society of Literature, founded in 1821, and incorporated 1825. Zoological Society, founded in 1825, and incorporated 1829; has an extensive collection of animals in Regent's Park. Geographical Society, incorporated 1830. Statistical Society, founded in 1834. Royal Botanical Society, incorporated 1839, and possessing 18 acres of garden in Regent's Park. Institute of British Architects, established 1834, and incorporated 1837. Institution of Civil Engineers, established 1818, incorporated 1828. Ethnological Society, Newman Street, Oxford Street; Numismatic Society, Gate Street, Lincoln's Inn; the Archæological Institute and Archæological Association, both branches of the Society of Antiquaries, and established in 1843. Most of these societies publish journals or transactions at stated periods; and they generally hold meetings weekly or every alternate week during six months of the year, from November to June.

There are also numerous institutions which partake, to some extent, the character of clubs, where newspapers and periodical publications are furnished to subscribers, and lectures are delivered by eminent men on various subjects. The oldest and most important of these is—

The Royal Institution in Albemarle Street, founded in 1799. Here Sir Humphry Davy and Sidney Smith delivered lectures, and Dr Faraday still maintains its reputation. It has a tolerable library and the current periodical literature of the day for the use of members. The London Institution in Finsbury Circus, the Russell Institution in Great Coram Street, the Marylebone, the Westminster, and the Pimlico Institutions, and a host of others, are all of the same class.

Again, the mechanics' institutes are after the same model, though on a smaller scale, and of these there are several in the metropolis. The circulating libraries are also very numerous; but perhaps the most important is the London Library in St James's Square, which now contains 78,000 volumes, collected within the last sixteen years. The Library of Sion College, London Wall, founded 1623, and that in Red Cross Street, established by Dr William's, who died 1716, are open to all respectable persons, and contain together about 60,000 volumes.

The National Gallery, which contains the chief portion of the national collection of paintings, constitutes the north side galleries.

London. of Trafalgar Square, and occupies one of the best sites in the metropolis. The foundation of the collection was made in 1824 by the purchase of Mr Angerstein's collection, but it has chiefly been increased by donations. The Gallery was erected in 1834-38, has a frontage of 460 feet, and contains, in all, ten rooms for pictures; this accommodation being shared equally by the trustees of the Gallery and by the Royal Academy. It contains many specimens of the Italian and Flemish, and a few of the Spanish schools; of which last the Holy Family, by Murillo, is a remarkably fine picture. There are, too, some good Claudes and Poussins in the gallery. In consequence of the late gifts to the public of the collections formed by Mr Vernon and Mr Sheepshanks, and of his own works bequeathed by Mr J. W. M. Turner, the moiety of the Gallery is now quite insufficient for the whole. On this account a portion, chiefly of the English school, has been temporarily removed to Marlborough House; and a royal commission is now (1857) sitting to fix upon a site for a new Gallery. The rooms in Trafalgar Square and Marlborough House are open to the public from Monday to Thursday inclusive, and to students on Tuesdays and Saturdays. A royal commission has this year (1857) been appointed for the formation of a portrait gallery in honour of distinguished men.

The chief private collections are those of Her Majesty, the Duke of Sutherland, the Marquis of Westminster, Marquis of Hertford, Earl of Ellesmere, Lord Ward, Sir Robert Peel, Mr Hope, Mr Thomas Baring, Mr Holford, &c.

Art Institutions.

The Royal Academy, chartered in 1768, is established under the same roof as the National Gallery. Here lectures on the fine arts, which now form part of the literature of the country, have been delivered by Sir Joshua Reynolds and other eminent presidents of the Academy. A good collection of paintings and casts, and copies from famous statues, are kept in the Academy for the use of students; and works of living artists in painting and sculpture are annually exhibited here. The sale of tickets yields the Academy a revenue of L.5000 or L.6000 a-year.

The British Institution, founded in 1805, is composed of amateurs, who, for the culture of public taste, lend and borrow good pictures, and exhibit them annually in their gallery, in Pall Mall.

The Society of Painters in Water Colours, established in 1804, has an annual exhibition of productions in this branch of art at 5 Pall Mall East.

The Society of British Artists in Suffolk Street, Pall Mall, is comprised of a section of artists who disapprove of the Royal Academy, or whose works have been rejected there.

The Art Union of London consists of a varying body of subscribers, to some of whom valuable works of art are distributed by lottery, and who all receive annually an engraving from the work of some British artist.

Of the societies for the cultivation of music,—

The Royal Academy of Music in Tenterden Street, Hanover Square, was founded in 1822. It affords tuition, vocal and instrumental, to indoor and outdoor students, on the payment of certain fees. There are, besides, the Sacred Harmonic at Exeter Hall, the Philharmonic, and several other similar societies.

Clubs.

London is especially remarkable for its clubs. The chief of these are the following:—

IN PALL MALL:—
Army and Navy.
Athenæum.
Carlton.
Guards'.
Oxford & Cambridge.
Reform.
Travellers'.

United Service.
United University.
IN ST JAMES'S STREET:—
Arthur's.
Boodle's.
Brooks's.
Conservative.
White's.

With the Junior United Service, in Charles Street, St James's; the Union, in Trafalgar Square; Oriental, in Hanover Square; and the City Club, in Old Broad Street.

Of all the clubs, White's is the oldest and most exclusive, dating its foundation about 1698, and reminding us of the White's chocolate-house of the *Tatler*, and of the days of Addison and Steele. It has not, however, the architectural pretensions of the club-houses in Pall Mall, some of which are copies after celebrated Italian palaces. Thus the Army and Navy Club is a pretty close imitation of the Palazzo Cornaro on the Grand Canal at Venice. These establishments are furnished in a very sumptuous manner, and afford a very luxurious style of *cuisine*. The number of members is usually limited, but varies in the different clubs from 300 to 2000. The members are elected by ballot; their entrance-fee varying from 9 to 30 guineas, and annual subscription from 5 to 12. All the clubs are provided with the newspapers and publications of the day, and some of them have extensive and valuable libraries. A few of these establishments, such as Brooks's, the Carlton, Conservative, and Reform, are of a political nature; others are exclusively professional, such as the two United Service, and the Army and Navy Clubs; and some are of a miscellaneous character.

London.

The largest monuments in London are "The Monument," the York and Nelson Columns, and the Wellington Arch. The first, a fluted Doric column 202 feet high, on Fish Street Hill, was constructed in 1671-8, from a design by Wren, to commemorate the great fire of 1666. The offensive inscription on its base, attributing the fire to the Roman Catholics, was removed in 1830.

Monuments and statues.

The column to the late Duke of York, raised in 1833, is at the top of the steps leading from Waterloo Place into St James's Park. It is plain Doric, 124 feet high, built of granite, and surmounted by a statue, 14 feet high, of his royal highness.

The Nelson column is fluted Corinthian, 176 feet high, having on the top a statue of the naval hero by Baily, and on the base sculptured reliefs illustrative of his death and the great events of his life.

The Wellington Arch, at the top of Constitution Hill, was erected from designs by Decimus Burton in 1828, and appropriated in 1846 to the support of an equestrian statue, by Matthew Wyatt, of the late Duke of Wellington.

The equestrian statues are those of Charles I., by I. e Soeur, at Charing Cross; William III., by Bacon, in St James's Square; of William, Duke of Cumberland, in Cavendish Square; of George III., by Wyatt, in Pall Mall East; George IV., in Trafalgar Square; and the Duke of Wellington, by Chantrey, in front of the Royal Exchange. The others of note are of Elizabeth, James I., Charles I., and Charles II., on Temple Bar; of James II., by Gibbons, in Whitehall Gardens; of Queen Anne, by Bird, in front of St Paul's; of William IV., in King William Street, City; of Her present Majesty, in the court of the Royal Exchange; of Pitt and Fox, in Hanover and Bloomsbury Squares; of the Duke of Wellington, in the Tower; of Sir Robert Peel, in Cheapside; of General Sir Charles Napier, in Trafalgar Square, &c.

London, in proportion to its extent and wealth, has fewer theatres than any other European capital. The largest and most fashionable is Her Majesty's Theatre, or the Italian Opera House, in the Haymarket. Burned down in 1789, it was rebuilt in 1790, and enlarged by Nash in 1818. It is now capable of containing 2500 persons; the boxes and stalls being private property, or let for the season, and the pit and gallery open, on payment, to the general public. The entertainments consist of operas and ballets; the singers, dancers, and musicians being almost exclusively foreigners; but though this house is liberally patronized, especially by the higher classes, far beyond the national theatres, it usually proves ruinous to any one bold enough to undertake its management.

Theatres

Drury Lane Theatre, in Brydges Street, the only patent

London.

establishment since the destruction by fire of Covent Garden Theatre in 1856, nominally enjoys a kind of monopoly of the legitimate drama. The present building is the fourth of a series erected here since 1663, two of which were burned in 1672 and 1809. That now in existence, built in 1811, and improved in 1820, has, it is said, sitting room for an audience of 3500. The regular drama having fallen into neglect of late, partly from the dearth of histrionic talent, and partly from the strong tendency of fashion towards musical entertainments, this house is now very often devoted to operas and dancing.

The Haymarket Theatre, first started in 1720, and rebuilt in 1821, and the Princess's Theatre in Oxford

Street, are both small, but well managed and successful.

London.

Besides these there are about seventeen minor theatres, not demanding particular notice here.

During the summer season the gardens at Vauxhall and at Cremorne, and the Surrey Gardens, are usually open in the evenings. Displays of fire-works, horsemanship, balloon ascents, music and dancing, form the chief attractions to those places.

The bridges spanning the Thames in its passage through Bridges.

London are 9 in number, 8 of these being adapted for carriages. The following table will show the cost and dimensions of these various bridges:—

Table showing the Material, Cost, &c., of the Bridges over the Thames, in London and its vicinity (compiled from McCulloch's Geographical Dictionary, and Parliamentary Paper (193) of Sept. 1856.

NAMES.	Date of completion.	Material.	Cost, including Approaches.	Cost, exclusive of Approaches.	Number of Arches.	Length.	Breadth.	Span of Central Arch.
			L.	L.		Feet.	Feet.	Feet.
London Bridge.....	1831	Granite	2,000,000	542,150	5	904	53	150
Southwark	1819	Iron arches, stone piers	800,000	384,000	3	800	42	240
Blackfriars	1770	Stone	260,000	157,840	9	995	42	100
Waterloo	1817	Granite	1,150,000	579,915	9	1380	42	120
Westminster	1751	Portland stone	389,500	...	15	1160	43	76
Vauxhall	1814	Iron arches, stone piers	Unknown.	300,000	9	840	36	78
Hungerford Suspension	1845	{ Brick & stone piers, } timber platform }	113,000	98,760	Nil.	1536	13	...
Chelsea Suspension	1857	Iron piers & roadway	88,000	...	...	922	45	...
Battersea	1770	Wood	Not known.	...	...	...	...	...

N.B.—The cost of New Westminster Bridge is estimated at L.235,000.

None of the existing bridges have any interesting associations connected with them, except London Bridge, and that only in right of its predecessor, so well known as Old London Bridge. In 1209 the latter (the first stone bridge) was built, and by dint of occasional repairs, it existed for upwards of six centuries. But the obstruction to the tides offered by its peculiar formation, proved so serious an evil, that it was at length necessarily doomed, and one of London's quaintest features disappeared in 1834. New London Bridge, begun in 1824, and completed in 1831, is placed about 200 feet farther up than the old one. It is built of granite, and was designed by the late John Rennie.

Proceeding up the river, the second is Southwark Bridge, leading from Queen Street, City, to Southwark. It was begun by Mr Rennie in 1814, completed in 1819, and is composed chiefly of cast-iron. It was constructed at the expense of a joint-stock company, by whom the tolls are levied.

Blackfriars Bridge, the next in position, commenced in 1760, was finished in 1770. It stands midway between Waterloo and Southwark bridges, and has unfortunately, within the last few years, shown symptoms of decrepitude.

Waterloo Bridge, the most admired of all, comes next, and was commenced in 1811, and finished in 1817. The arches, nine in number, are elliptical, and each 120 feet wide, so that its symmetry is perfect and its roadway a dead level. It was built by the late Mr Rennie for a joint-stock company, and is undoubtedly his greatest work. Canova declared it to be the finest feature of London. But though most ornamental to the city, it is, in consequence of its toll, but little frequented.

Hungerford Suspension-Bridge, opened in 1845, is the only one exclusively for foot passengers; but the proprietors, who levy tolls, contemplate widening the bridge for a carriage-way. It springs on the Middlesex side from Hungerford market, and rests on the Surrey side, near the terminus of the South-Western Railway.

Westminster, the oldest of the metropolitan bridges, was begun in 1739, and completed in 1751. The roadway has been materially lowered within the last twelve years;

and the lofty stone balustrade which obstructed the view has been removed, and an unsightly wooden boarding substituted. From the very low situation of the New Houses of Parliament, they are to some extent hidden by this bridge, and it is therefore proposed to build another more in harmony with them.

Vauxhall Bridge, next in order, was commenced in 1813, and finished in 1816, by a joint-stock company still in receipt of the tolls. It affords ready communication with Surrey to Belgravia and other new districts lately created by Mr Cubitt and the Marquis of Westminster.

Chelsea Suspension-Bridge, commenced in 1851, is all but finished, and will be opened this year (1857). It connects Chelsea with the new park at Battersea, and, taken in conjunction with it and the embankment of the Thames from Vauxhall Bridge to Cheyne Walk, forms a gigantic undertaking.

Battersea Bridge, a wooden structure, connects Chelsea with Battersea, and is the last of the bridges within the metropolitan boundaries. It belongs to a body of about thirteen proprietors, who levy tolls, and derive about L.500 per annum each as net revenue.

The tunnel under the Thames, one of the wonders of Thames London, is situate about 2 miles below London Bridge, tunnel. starting from the Middlesex side of the river in High Street, Wapping, and leading into Rotherhithe, on the Surrey side. This great achievement was effected by the late Sir Isambert Brunel, the distinguished inventor of block machinery, &c. It was undertaken for a joint-stock company, incorporated in 1824; and the expense was originally estimated at L.160,000. The tunnel was commenced in 1825, and, after repeated accidents from invasions of the river, it was, with the assistance of government grants, completed in 1840. It is of brick, and its form is cylindrical; a tube nearly 1200 feet long being cut by a longitudinal division into two equal parts or roadways, 15 feet high by 12 broad. It is entered at either end by long descending stairs; and this difficulty of approach, and other circumstances, have hitherto rendered this great triumph of science and perseverance of comparatively little service to

London. the public. It is used to some small extent by passengers, but chiefly visited as a curiosity.

Corpora-
tion of
London. Though the government of by far the greater part of the metropolis is intrusted to the secretary of state for the home department, and administered under him by the commissioners of police; yet that portion known as *The City*, is under the exclusive superintendence of the Corporation of London, a body wielding considerable power, and possessed of extensive property.

The origin of this body has been shortly alluded to in the commencement of this article. It consists of the lord mayor, the court of aldermen, 25 in number, exclusive of his lordship, and 206 members forming the court of common council. The lord mayor is chosen annually from among the aldermen, but is capable of re-election. The right of nominating two aldermen worthy of election to the dignity, is restricted to those freemen of the city who have been admitted into the livery of their respective guilds or companies. The court of aldermen then decide which of the two is to be promoted. The number of livery-men in 1856-7 was 6611. (See LIVERY.) The other essential qualification for the mayoralty is previous service as sheriff. The aldermen hold office for life. They are elected one for each of the 26 divisions or wards of the city, and all resident freemen are entitled to vote in the election for their ward, whether they are livery-men or not. Each alderman appoints one deputy, and in some cases two, for his ward.

The members of common council are chosen annually by the rate-payers of the various wards, but members are for the most part re-elected. As shown in the following table, the several wards differ very materially in extent, and so does the number of their representatives in common council:—

Account showing the Number of Common Councilmen returned by each of the 26 Wards of the City of London.

Wards	Common Councilmen.	Wards.	Common Councilmen.
Aldersgate	8	Cripplegate Within	108
Aldgate	8	and Without	16
Bassishaw	4	Dowgate	6
Billingsgate	8	Farringdon Within...	14
Bishopsgate	14	... Without...	16
Bread Street	8	Langbourn...	8
Bridge Within	8	Lime Street	4
Bridge Without	Nil	Portoken	8
Broad Street	8	Queenhithe	6
Candlewick	6	Tower	8
Castle Baynard	8	Vintry	6
Cheap	8	Walbrook.....	6
Coleman Street	8		
Cordwainers	6		206
Cornhill	6	Aldermen.....	26
Forward ...	108	Total.....	232

The ward of Bridge Without is a sinecure reserved for the senior alderman, as there have been no inhabitants in it since the demolition of Old London Bridge. The civic deliberative assembly meeting in Guildhall consists of 232 members, of which his lordship is *ex-officio* president. The law officers of the corporation are the recorder and common serjeant, both barristers, who have seats in this assembly, but no vote. The sheriffs are chosen annually on Midsummer-Day by the livery, and are executive officers for the county of Middlesex as well as the city of London.

The chamberlain is chosen annually by the livery, but the office is virtually one for life. He has the care of the city revenues. Besides, there are the city remembrancer, solicitor, town-clerk, comptroller, and many inferior officers, most of whom are chosen by the court of common council.

The dignity and power of the lord mayor is great. He is the representative of royalty in the civil government of

the city, chief commissioner of its lieutenancy, conservator of the River Thames, and on the demise of a sovereign he becomes *pro tem.* a member of the privy council. To maintain the fame of the city for hospitality, an allowance of L.8000 per annum is made to his lordship, with the use of the Mansion House, furniture, carriages, &c. To generous mayors this sum is insufficient, while the parsimonious profit by the undertaking. But municipal honours are not now, as in the olden time, the pride and ambition of the first merchants and bankers of the city, and from various causes all city men of the highest standing studiously avoid any distinction of this kind.

The 9th of November, when the lord mayor enters into office is kept as a partial holiday in the city. He then proceeds in state to Westminster Hall, where he is duly sworn, and in the evening he gives a banquet in Guildhall to the great officers of state, judges, foreign ambassadors, city functionaries, &c.

The report of the commissioners appointed to inquire into the state of the Corporation of London, presented to Parliament in 1854, gives an account of the revenue and expenditure of the city for 1852, from which it appears that the former amounted to L.551,971, 5s. 4d., and the latter to L.403,983, 1s. 2d., leaving a surplus of L.147,988; but of this L.127,710 was payable to the government office of works, for metropolitan improvements beyond the limits of the city. The report alluded to recommends some radical changes in the constitution of the corporation, and considerable abridgment of its privileges. Already bills, adopting in great measure the suggestions of the commissioners, have been brought into Parliament, and will most likely ere long pass into law.

Neither the Mansion House nor the Guildhall is remarkable for architectural beauty, though both of them are large buildings. The former was erected in 1740, and the latter in 1789, on the site of a previous Hall built in 1411.

The following are three of the chief items of the city revenue in the year 1855:—

Duties on coals brought to the metropolis.....	L.135,154
Police rates.....	56,505
Sewer rates.....	75,764

Intimately connected with the corporation are the various guilds or companies composed of livery-men, and whose functions in civic elections have been already noticed. Of these companies there are upwards of 80, of which 39 have halls, the rest meeting in Guildhall or in taverns.

In Stow's time there were but 63, and of these there were 12,—

The Mercers,	The Merchant Tailors,
... Grocers,	... Haberdashers,
... Drapers,	... Salters,
... Fishmongers,	... Ironmongers,
... Goldsmiths,	... Vintners, and
... Skinners,	... Clothworkers.

—called by him “honourable companies, out of which the lord maier is to be chosen yearely, because those of inferiour ranke are not capable of such dignitie.” This restriction no longer exists, but the twelve companies still maintain a certain pre-eminence, and are called the “great companies.” Some of these are possessed of large property; the goldsmiths, mercers, grocers, fishmongers, merchant tailors, &c., having noble halls where they dispense the most princely hospitality. The goldsmiths (the richest of all) existed as early as 1180, but were not chartered till 1327, and were long the chief bankers of London. At present all articles of gold and silver must be assayed and marked by this company. Their new hall, on the site of the former one in Foster Lane, is classic in style, and of noble proportions, but hidden by neighbouring houses. The others of most mark are Fishmongers’ Hall at the corner of London Bridge; Mercers’ Hall in

London. Cheapside; Grocers' Hall in Bank Buildings; Merchant Tailors' Hall in Threadneedle Street, &c., &c.

Police. The police force, in its present form, was established in 1829. There are in all thirteen police courts in the metropolis, of which eleven are under the superintendence of the Home Secretary, and two under that of the city corporation; justice being dispensed in the former by stipendiary magistrates, and in the latter by the mayor and aldermen. London is indebted for its present efficient police force, as for many other advantages, to Sir Robert Peel. There are in all upwards of 128 city and metropolitan police stations. The following table will show the distribution of the police force between the city and other parts of London:—

Return showing the Strength of the Police Force employed in the Metropolis in 1856, distinguishing those employed by the Commissioners of Police, and those employed by the Corporation of the City of London:—

Police.	Total Number of Men.	Average Number on Day Duty.	Average Number on Night Duty.
Force acting under Commissioners of Police, consisting of 18 divisions (A to V and Thames).....	5817	2272	3545
Force under the Corporation of the City of London.....	589	340	249
Total.....	6406	2612	3794

Debtors' prisons.

The prisons for debtors in the metropolis are three in number,—the Queen's Prison and Horsemonger Lane Gaol in Southwark, and Whitecross Street Prison in the City. The Queen's Prison contains 220 rooms, but from changes in the law it is now comparatively little used. Formerly, debtors imprisoned here were allowed to purchase the right to live within the rules or liberties of the prison, which extended for a considerable distance around its walls. This system was abolished by 5th and 6th Vict., c. 22.

The numbers of prisoners for debt in two of the metropolitan prisons during the year ended 25th March 1856 were:—

Prisons.	Prisoners.
Queen's Prison	400
Whitecross Street Prison	2358
Total.....	2758

Criminal prisons.

Of prisons for criminals there are twelve within the bounds of the metropolis. The first and most noted is Newgate Prison in the Old Bailey, the common gaol for London and Middlesex. The old gaol was burned by a mob in 1780, but a new one having been partially built at that period, it was soon completed. The number of prisoners varies from 300 to 950, though there is not proper accommodation for above 480. In front of this prison sentences of death are carried into effect for capital crimes committed in London and Middlesex.

Under the management of the directors of government convict prisons are the four following:—

Millbank Prison, to accommodate	1100 males and 180 females.
Pentonville	560 males.
Brixton	650 females.
Fulham Refuge	180 females.

Besides these there are—

The House of Correction at Holloway, a new establishment, calculated to hold.....	420
Cold Bath Fields Prison, near Gray's Inn Lane	1398
The House of Correction in Tothill Fields, Westminster ...	900

House of Detention at Clerkenwell	331
Criminal side of Horsemonger Lane Gaol.....	364
Surrey County Gaol, Wandsworth Common.....	708
Borough Compter, in Mill Street.	

London.

The following is an account of the number of persons imprisoned in each of the principal prisons during the year ended 25th March 1856:—

Table showing the Number of Prisoners confined in the various Metropolitan Gaols and Houses of Detention for Criminals, and the Mortality therein, in the Year ended 25th March 1856.

Gaols, &c.	Numbers confined.	Deaths.
Newgate Prison	2,072	1
Holloway House of Correction	2,242	2
Cold Bath Fields Prison	8,113	28
Westminster House of Correction	7,980	11
Clerkenwell do.....	11,418	1 (suicide)
Millbank Prison.....	2,093	11
Pentonville Prison.....	1,032	6
*Horsemonger Lane Gaol	3,511	1
Total.....	38,461	61

* This prison includes debtors.

The tendency within the last twenty years has been to suppress prisons in the crowded parts of the metropolis; and in this way London has got rid of the Fleet, Marshalsea, and Giltspur Street Prisons; and a fourth—the Bridewell—has fallen into disuse.

There are 71 main sewers, and about 1000 miles of sewers in the metropolis, and the same extent of house or minor drains. In 1854 there were 347 miles of pipe sewers alone, draining about 27,000 houses. But large as this amount of sewerage appears to be, it is still far from being adequate to secure the comfort of the inhabitants, and cesspools and such like nuisances still exist to a considerable extent. The sewers of "The City" are managed by the City Commissioners of Sewers; while the superintendence of the sewers and the gradual extension of a proper system of drainage to every other part of the metropolis has been entrusted to the New Metropolitan Board of Works established in 1855. It is seriously proposed to divert the whole drainage of London from the Thames, to carry it off in a monster sewer, and to throw it into the sea.

Owing to the overcrowded and offensive state of many of the metropolitan churchyards, the necessity for other receptacles for the dead has long been apparent. The consternation produced in London by the late visitations of cholera gave rise to the Metropolis Burials Act and the appointment of inspectors of burial-grounds. All such as are, from time to time, considered dangerous or unwholesome are now, by order in council, closed against funerals. The number of cemeteries in the suburbs of London has constantly increased of late years. Many of these cemeteries are prettily situated, such as those at Highgate and Norwood; and most of them are laid out with great taste. The others of most importance are,—the Brompton Cemetery (the property of government); Kensall Green, on the Harrow Road, formed in 1832, and the property of a joint-stock company; and Abney Park, Stoke Newington, and Nunhead cemeteries. The London Necropolis Company have also a cemetery at Woking, whither funerals are conveyed by railway. It is doubtful, however, whether private companies can safely be trusted with the management of these concerns, as their pecuniary interests are so much at variance with the promotion of public health. It would therefore be sound policy on the part of the govern-

London. ment to take these establishments into its own management, and suppress all private speculations of the kind.

Insurance against fire. It is calculated that, on the average, the annual number of destructive fires in this city amounts to 665; and hence the system of insurance against fire is very general. There are in London alone forty-nine offices for effecting this species of insurance; and the chief insurance companies maintain a fire-engine establishment at twenty-two different stations throughout the metropolis. As already mentioned, too, there are fire-plugs in every street for the supply of water for the engines, and fire-escapes for saving life are kept ready at convenient spots throughout the metropolis.

Fire-engines.

The troops usually kept in London consist of two of the three regiments of Life-Guards and Horse-Guards, and 5 battalions of Foot-Guards, numbering in all 4860; and there is barrack accommodation for 132 officers and 4845 men. The principal barracks for the Foot-Guards are the Wellington Barracks in Bird Cage Walk, the barracks in the Tower, at Charing-Cross, Portman Street Portman Square, and St John's Wood; the chief cavalry barracks being situated in Knightsbridge, Hyde Park, and Albany Street, Regent's Park. A volunteer corps, called the Royal Artillery Company, and composed of citizens, is well maintained, and their training-ground lies near the City Road.

As may be seen from the table annexed, the metropolis returns 16 members to parliament; Marylebone, Finsbury, Tower Hamlets, and Lambeth, having acquired their right under the Reform Act. The inhabitants of certain districts of London, such as Chelsea, Kensington, Brompton, Notting Hill, &c., which are not included in any of the metropolitan cities or boroughs, form part of the constituency of the county of Middlesex. It has been more than once proposed to constitute Chelsea, Kensington, &c., a parliamentary borough, with the right of returning two members; and from their growing importance, it is likely that this proposition will ultimately be carried out.

Account of the number of Representatives allotted to each of the Parliamentary Cities and Boroughs in the Metropolis, and the Number of Electors Registered in each in 1857.

Cities and Boroughs.	Members.	Registered Electors.
London (City of).....	4	19,115
Westminster (City of)...	2	13,182
Marylebone (Borough)	2	20,851
Finsbury,* do.....	2	20,025
Tower Hamlets, do.....	2	27,980
Southwark, do.....	2	10,170
Lambeth,* do.....	2	18,131
Total.....	16	129,454

* The numbers of electors for Finsbury and Lambeth are applicable to 1852.

Greenwich, which is now an outpost of London, also returns two members.

Internal and external communication.

Looking at the map of London, the River Thames attracts the eye as forming one great means of metropolitan internal communication; and the steamers which ply from the east to the west end every five minutes during the day, materially relieve the crowded streets from what would otherwise be an intolerable pressure.

Railways.

The shipping of London, one of its greatest means of communication, has already been noticed.

The great railways having termini in London are,—the North-Western, Great Western, South-Western, South-

Eastern, Eastern Counties, and Great Northern, and these afford means of reaching all parts of the empire with wonderful speed and comfort, and at moderate fares. There are also smaller lines more exclusively for the convenience of Londoners, such as those to Greenwich, Blackwall, Hampton Court, Windsor, &c.

London.

Street communication.

There are at present (1857) in London 4312 hackney cabs, and 1019 omnibuses, for the conveyance of persons from any part of the metropolis to another. The cabs, though not what they should be, and still inferior in comfort and cleanliness to those of other large cities, have been much improved since placed under the more immediate surveillance of the police. They convey two persons, with a moderate allowance of luggage, at the rate of 6d. per mile, within a radius of 4 miles from Charing Cross; while by omnibuses one may travel half-a-dozen miles for 6d., or even less. The extent to which the latter are patronized may be estimated from the weekly traffic receipts of the General Omnibus Company (the chief proprietors of these vehicles), which amounted, in the week ended 7th March 1857, to L.10,818, 15s.

The great street thoroughfares are about eight in number, one half running from E. to W., parallel to, or following to some extent the sinuosities of the river, and the rest tending from N. to S., and cutting the others nearly at right angles. Of the former, the most important are,—1st, That running from the Tower through Eastcheap, Cannon Street, Fleet Street, and Strand, and either by Drury Lane and Long Acre to Piccadilly and Kensington, or by Whitehall and Victoria Street to Pimlico; and 2d, That leading from Mile-end through Whitechapel, Cheapside, Newgate Street, Holborn, and Oxford Street, to Bayswater. Of those running from N. to S. may be distinguished,—1st, That from Kingsland Road through Shoreditch and Bishopsgate Street, by London Bridge and High Street, Borough, to the Bricklayers' Arms; and 2d, That from Kentish Town Road by High Street, Camden Town, the Hampstead Road, and Tottenham Court Road or Gower Street, through Bow Street, and by Waterloo Bridge and Waterloo Road to the Elephant and Castle.

The Regent, and Grand Junction Canals, besides serving as the means of internal navigation to the Irish Channel, are most useful (as are also, on a smaller scale, the Surrey, Grosvenor, and Kensington Canals) in conveying coals and such heavy goods into the heart and outskirts of the metropolis. The facility of postal communication is elsewhere noticed.

The Electric Telegraph Company have twenty stations in different parts of London; and at charges varying from 1s. 6d. to 5s. and upwards, convey messages to almost all the civilized parts of the old hemisphere, and measures are in progress for completing communication of this kind with America.

The fate of London has often given rise to prophetic speculations; and an eminent historian of the present day has shadowed forth its ruin at a somewhat distant period. But though it has increased enormously within the last century, its increased facility of communication, and advance in science, have been in a greater ratio. We may therefore safely quote the words of David Hume as applicable to the London of the present day. Speaking of its enormous and increasing size, he says,¹—"Some men are apprehensive of the consequence. For my own part, I cannot help thinking, that though the head is undoubtedly too large for the body, yet that great city is so happily situated, that its excessive bulk causes less inconvenience than even a smaller capital to a greater kingdom." (H. C. R.)

¹ Essay on Public Credit.

London
||
London-
derry.

LONDON, a town of Canada West, capital of Middlesex county, is situate on the left bank of the Thames, an affluent of Lake St Clair, 115 miles S.W. of Toronto. It stands in the centre of the great peninsula which divides Lakes Huron and Erie; and is connected by railway with Detroit, Toronto, Montreal, and Quebec. The town was laid out in 1826, and since then it has risen rapidly into importance. In 1844 and 1845 it suffered severely from fires, which consumed at different times the Episcopal church and many of the houses. These, however, were rebuilt; the former in greater elegance, the latter on a more commodious and substantial plan. In 1855 London contained several fine buildings, such as the city hall, erected at a cost of £15,000; a market-house, and 12 churches, belonging to the Episcopalian, Roman Catholic, Wesleyan, and other denominations. Its schools also fully supply the wants of the community, and are well attended. Iron-casting is carried on with considerable success, while coal is comparatively plentiful. The chief trade of the town, however, is in the grain of the county, which is reputed one of the most fertile in Upper Canada. Pop. (1852) 7000, (1855) about 13,000.

LONDON, *New*, a seaport-town of the United States of N. America, New London county, Connecticut, on the W. bank of the Thames estuary, 3 miles from the sea, and 120 miles E.N.E. of New York by railway; N. Lat. (of light-house) 41. 18. 57, W. Long. 72. 5. 4. It is situate on an acclivity which rises from the waterside, and attains a considerable elevation at the back of the town. The streets are not so regularly laid out here as in most American towns, owing to the inequality of the ground, which rests on a granite formation. Much, however, has been done of late to level the surface. The chief public edifices are,—the custom-house, a handsome granite building near the river, the court-house, and numerous churches belonging to the various denominations, besides public and private schools. The harbour of New London is one of the best in the Union, being 3 miles in length, with 5 fathoms of water, and is seldom obstructed with ice during winter. It is protected from the ocean by Fisher's Island. The great trade of the port is connected with the whale fishery, which is carried on yearly in a number of vessels, having an aggregate burden of 16,000 tons. In 1849, 1949 barrels of sperm oil arrived here, besides 38,030 barrels of common whale oil, and 2688 cwts. of whalebone. The coasting trade and cod fishery are carried on here with much vigour and success; while ship-building and machine-making are also on the increase. The town was settled in 1644, and a large part of it was burned by the British under Benedict Arnold, in September 1781. Pop. (1840) 5519, (1850) 8991, (1853) about 10,000.

LONDONDERRY, a maritime county in the province of Ulster, in Ireland, bounded on the N. by the Atlantic, on the E. by the county of Antrim, on the S. by that of Tyrone, and on the W. by Donegal and Lough Foyle. Its greatest length is from the point of Magilligan, at the entrance of Lough Foyle, to Cookstown, a distance of 52 miles; its greatest breadth, from the western point of the liberties of Londonderry to Vow Ferry, on the Bann, is 44 miles. It extends over a surface of 810 square miles, or 518,595 acres, of which 318,282 are arable, 180,709 uncultivated, 7718 in plantations, 1559 in towns, and 10,327 under water. The uncultivated pasture land of this county is chiefly situate in elevations exceeding 800 feet above the sea. Of the entire quantity, it is probable that about 50,000 acres may be improved for cultivation, 60,000 may be drained for pasture, and 71,000 may be considered as unimprovable, consisting of the tops of the highest ridges of mountains, and the sands of Magilligan.

According to Ptolemy, the tribe of the Robogdii were located here. Afterwards it was the territory of the O'Cahans,

who were feudatories of the great O'Neil family. After the confiscation of O'Neil's princely estate, in consequence of his abrupt flight into Spain at the commencement of the reign of James I., this county was offered to the city of London on certain conditions. The city accepted the grant of the towns of Derry and Coleraine, and the whole country betwixt them, which is above 20 miles in length, bounded by the sea on the N., the river Bann on the E., and the river Derry, or Lough Foyle, on the W. The common council appointed a special company for the management of the affairs of the plantation, afterwards well known under the name of the Irish Society, and retaining in its possession the houses of Londonderry and Coleraine, the lands attached thereto, and the woods, ferries, and fisheries. The remainder of the grant was in 1613 divided into twelve lots, and balloted for by the great London companies, viz., the drapers, salters, vintners, mercers, ironmongers, merchant tailors, clothworkers, haberdashers, fishmongers, grocers, goldsmiths, and skippers. The county is now divided into the baronies of Coleraine, Kenaught, Loughinsholin, and Tirkeeran, together with the liberties of Londonderry and Coleraine, which have separate jurisdictions. These greater divisions are subdivided into forty-three parishes, chiefly in the diocese of Derry.

The diocese of Derry is much larger, both as to number of parishes and extent of surface, than the county, comprehending, besides the parishes within the civil boundary, ten in Donegal, eleven in Tyrone, and part of a parish in Antrim. By a curious anomaly, the ecclesiastical jurisdiction of the parishes in the liberties of Coleraine belongs to the Bishop of Down and Connor. The seat of the see is in the city of Derry, where is the cathedral, a building in inferior Gothic style, erected in 1633. The chapter consists of a dean, an archdeacon, and three prebendaries.

The neighbourhood of the great Western Ocean, and the height of the mountain ranges, may account for the fall of a considerable quantity of rain; yet Mr Sampson in his survey of the county states the mean annual depth of rain as only 31 inches, and in the ordnance survey of the parish of Templemore it is stated at 34.2 inches.

The surface of the county presents an appearance of valleys separated from each other by ridges of rugged but not very elevated mountains, and expanding as they approach the coast into alluvial plains. The most elevated of the mountains are,—Sawel, 2236 feet high; White Mountain, 1996 feet; Slieve Gallen, 1730 feet; Cairntogher, 1521 feet; Donald's Hill, 1318 feet; Benyevanagh, 1262 feet; and Legavannon, 1269 feet.

The principal river is the Roe, which, receiving as it flows in a northerly direction the tributary streams of the Owenbeg, Owenmore, Gelvan, Castle, and Curley, discharges itself into Lough Foyle, below Newtown-Limavady. The mud deposited near its mouth forms shifting banks, which prevent it from being a useful port for small craft. The Faughan rises in the S., and discharges itself into Lough Foyle, nearly opposite Culmore Fort. The Moyola takes a south-eastern course, and falls into Lough Neagh. A small portion only of the Foyle belongs to the county. It is navigable for vessels of large burden as far as the city of Londonderry, and thence to Lifford in Donegal for lighters of 20 tons. The Upper Bann, from Lough Neagh, forms the eastern boundary until it approaches Coleraine, where it separates the barony from the liberties of the town. The navigation of this river is impeded by shoals, which form a dangerous bar.

The valleys formed by these rivers, and their subordinate branches, are called *slacks*. The most beautiful is that of Fin-Glen. On the western side of the ridge of Benyevanagh there is a shaking quag, named the Gray Lough, which spreads over many acres. Cattle can pass freely through it in summer, yet at every step the soil yields

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to the pressure, communicating an undulating motion all around. The surface is broken in every direction by pits full of water of unknown depth, and all invariably rectangular parallelograms, very much resembling tan-pits. The only lake is Lough Finn, situated in the confines of Tyrone; it is of very inconsiderable dimensions. Lough Neagh touches the county over about 6 miles of its south-eastern boundary. The small port of Ballyronan, in the N.W. angle of the lough, affords accommodation for sloops of 60 tons to load and unload. The inlet of Lough Foyle forms the principal part of the western boundary. Having a narrow entrance, but with 10 fathoms of water, between Culmore Fort and Magilligan Point, it expands itself at high water into a gulf of 15 miles in length and 7 in breadth, with a channel 14 fathoms deep at low water, but very narrow, and therefore of difficult navigation.

The soil in the northern part, along the sea-coast, is a stiff and reddish clay, interspersed with knolls of basalt, and resting on a substratum of white limestone, which occasionally appears on the surface. Near the mouth of the Roe is an extensive tract of a marly nature, formed of layers of clay and shells, alternating to a depth of several feet. Fossil shells are frequently found in the ditches. The lands lying between the loamy soil in the low grounds and the higher wastes are either of a blue clay with fragments of quartz, slate, and a shallow covering of peat moss, or a shingle of slate interspersed with red ochreous sand, or with gravel and loam. Above the lime is the region of the trap, and the soil is generally without clay, being merely composed of the softer parts of this ochreous sand, producing little but potatoes and straw. Yet its summits are admirable as sheep walks; for, if the immediate substratum be of the fossil known by the name of zeolite trap, the soil is fertile and the herbage sweet, presenting an elegant carpeting of shamrock, daisy, butter-cup, and plantain, which is eagerly browsed on by sheep.

The valley of the Roe divides the county into two districts, totally different in respect to their geological character. On the W. lies the territory of clay slate, on the E. that of basalt. The prevalent species of slate is a kind of flag-rock or micaceous clay slate, next to which in quantity is a laminated flag, the dip of which is generally N.W. The great mountain of Sawel is composed of several varieties of this rock, surmounted towards the summit by amorphous whinstone, interspersed with veins of quartz. Slieve Gallen is also a mass of trap, resting upon granite, which emerges from beneath in various places. Limestone may be found everywhere, from the sea to Benbradagh. The most remarkable cavern on the coast is in the white limestone; it is very appropriately called the Robber's Cave, having at one time been the asylum of formidable banditti. A species of blue limestone has been used for various architectural purposes. Sandstone is universally found below the basalt, and is occasionally intermingled with slate. A species of it, of a bright tawny colour, is raised in large quantities near Dungiven. Many of the principal buildings are constructed of it. Iron is found in great abundance, as bog ore. To the abundance of this metal in the peat moss is to be attributed the red colour of the ashes, which are so heavy as to keep in heaps even in a breeze of wind. Copper and lead, in small veins, have been discovered. Boate states that pure gold had been found in a rivulet which discharges itself into Lough Neagh; but the fact has not been substantiated by subsequent discoveries, further than that some specimens of quartz have been observed to contain thin laminæ of that metal. Quartz and hornstone are common in all parts. The latter sometimes exhibits marine impressions, the quartz never. In all the mountains composed of slate with pyrites the streamlets show strong indications of iron,—to such a degree, indeed, that in some places the water is not fit for drinking.

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The treatment of arable ground differs little from that generally practised throughout the province. The principal crops are oats and potatoes; the implements, the Scotch and Irish ploughs; the manures, sea-weed, and composts of which it forms a part, near the coast, and lime and turf-mould in the interior. The shell banks of Lough Foyle also furnish valuable manure. When the tide is out these banks form extensive flats, which are firm enough to be walked on without inconvenience, and are resorted to by numerous boats for loads of shells, which are all of recent species, and the supply is apparently inexhaustible. "They are particularly useful in bringing bad lands into cultivation, and in ameliorating stiff wet clays, deficient in calcareous matter, being applied at the rate of from thirty to sixty barrels per acre. They are preferred to lime as warming and bristling the land." In Magilligan the mossy sands are alternately ploughed and laid up in meadow.

The farms in this county are generally small; out of 17,000 holdings exceeding one acre in extent, about 13,500 are of less than 30 acres, 2100 between 30 and 50 acres, and 1100 between 50 and 100 acres. The extent of land under each description of crop in 1855 and 1856 was:—

	1855. Acres.	1856. Acres.
Wheat.....	3,201	5,424
Oats.....	91,990	87,017
Barley, Bere, Rye, Beans and Pease...	2,084	2,368
Potatoes.....	31,983	35,464
Turnips.....	11,451	10,301
Other Green Crops.....	1,454	1,545
Flax.....	11,795	13,959
Meadow and Clover.....	20,379	22,310
Total.....	174,337	178,388

The florin grass springs up luxuriantly here. Amongst the more uncommon species of grasses may be mentioned the *Parnassia palustris*, commonly called crottel,—in Irish croutail.

The total quantity of live stock in the county in 1855 and 1856 was:—

	1855. No.	1856. No.
Horses.....	20,331	21,254
Cattle.....	102,185	101,556
Sheep.....	23,888	32,129
Pigs.....	22,828	23,679

There are no great herds of goats in the mountains, but a few are found in many of the habitations of the cottiers. Magilligan contains a very large rabbit-warren, extending over 1500 acres. The poultry are numerous, and flocks of geese are fed in summer on the vetches and tares which abound in the bottoms, in autumn on the stubble, and in winter on the potato-ridge. The county was once remarkable for the quantity of honey it produced; latterly the produce has decreased.

The linen manufacture is the staple here, and contributes greatly to the comfortable support of the population. The yarn and linen are generally of a coarser staple than in the neighbouring county of Antrim. Sacking is made of the tow-yarn. Potteries, in which the coarser kinds of earthenware are manufactured, are carried on in some places. There are several large distilleries and breweries, and some salt-works. One of the most productive salmon fisheries in Ireland is on the Bann, near Coleraine.

The most remarkable relic of ancient fortification is the Giant's Sconce, or Ring, a remarkable remnant of pagan times, situate in the pass between Drumbo and Largantea. It formed a circular space of about 600 feet in diameter, on an isolated knoll of basalt, difficult of access on all sides but the N.E., where art has supplied the deficiency by a wall of massive masonry. The interior was hollowed, as if for a receptacle for men and stores; whilst a covered way, admitting only one person in a stooping posture to pass at

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a time, surrounded the whole. Several cromlechs are still in existence, some of them surrounded by a circle of upright pillars, somewhat like Stonehenge. The most remarkable is that at Slacht Manus. Cairns are too numerous to admit of special notice. Danish forts are sometimes exposed. Sepulchral pillars are numerous, and one peculiarly remarkable stands near Dungiven. Artificial caverns, evidently constructed for the concealment of men and property, are frequently discovered. They are rudely built of stone, without cement; and flags or long stones form the roof. They consist of narrow galleries, some at right angles with the main entrance, others parallel to it. The entrance is usually concealed by a rock or grassy sod. Castles of acknowledged Irish erection are few. That of Carrickreagh is looked upon as amongst the most ancient. Near Ballyraghran was another. Both are said to have been residences of the family of the M'Quillans. Pieces of pit-coal, found in the cement of the walls, lead to the opinion that the operations of miners were practised in those remote ages. Some of the castellated mansions of the first English settlers, with their *bawns*, are still in a state of preservation; as at Killolod, Dungiven, Salterstown, and Muff.

The most ancient monastic building was the abbey of Derry, founded by S. Columba in the sixth century, and on the site of which the present cathedral stands. At Coleraine were two monasteries, one of Dominicans, the other of regular canons. At Camus, on the Bann, was a very celebrated monastic structure, attributed to St Comgal. The only remains of it at present existing are the fort, with a pillar curiously carved. The remains of the abbey of Dungiven are the most interesting in the county. It was the burial-place of the O'Cahans several of whose tombs have resisted the attacks of time. The principal monument is that of one of the chieftains, named Cooley-nagal. There is a tower at the north-west side of the building, and a sepulchral pillar placed on an artificial mount. A smaller tumulus in the vicinity, when opened, was found to contain an urn of earthenware with bones. The urn was surrounded with white stones. Other tumuli, when examined, exhibit similar results.

The number of pupils attending each description of school during the week ending 15th April 1851 was:—

Schools.	No. of Schools.	Scholars.		
		Male.	Female.	Total.
National.....	145	3657	3153	6,810
Church Education.....	33	652	627	1,279
London Corporations.....	24	645	621	1,266
Diocesan.....	1	74	...	74
Endowed.....	6	188	125	313
Boarding.....	3	43	47	90
Agricultural Boarding.....	1	61	...	61
Private.....	73	1318	979	2,297
Parochial.....	18	541	269	810
Free.....	15	304	268	572
Industrial.....	1	...	37	37
Military.....	1	102	7	109
Mission.....	11	422	309	731
Charitable Boarding.....	1	88	...	88
Workhouse.....	4	318	300	618
Gaol.....	1	32	32	64
Total.....	338	8445	6774	15,219

The great London companies have always afforded marked encouragement to the education of the people, and no consideration as to the religion of the children is allowed to interfere with their bounty.

The population has increased progressively from the earliest period at which any probable estimate of its amount was made until the last two decennial periods:—

Year.	Authority.	Population.
1760.....	De Burgho.....	46,182
1792.....	Beaufort.....	125,000
1813.....	Parliamentary census.....	186,181
1821.....	Ditto.....	193,869
1831.....	Ditto.....	222,012
1841.....	Ditto.....	222,174
1851.....	Ditto.....	191,868

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The last of these estimates gives an average of 237 inhabitants to each square mile. The county is represented in the imperial parliament by two members for the county at large, and one for each of the boroughs of Londonderry and Coleraine.

LONDONDERRY, the capital of the above county, stands on the W. side of the River Foyle, near to its junction with the lough, spreading itself over the summit and sides of a hill which here projects into the river, and which was once covered with oak trees, whence the place derived the name of Derry Calgach, "the eminence covered with oaks," which it still partially retains. "The situation of Londonderry is," says Inglis, "the finest of any town or city in Ireland. Indeed, with the exception of Edinburgh, I do not know any town in the United Kingdom so well situate as Londonderry." Its monastery first drew inhabitants hither. The town was entirely ecclesiastical, consisting almost exclusively of churches and the dwellings of the clergy and their dependents. The English government, after having been baffled in several attempts to plant a garrison here during the war against the Earl of Tyrone, at length succeeded, in 1600, in gaining possession of the place, and securing it against any efforts of the Irish to dislodge them. It was surrounded with a substantial wall, strengthened with bastions, and had four main streets diverging at right angles from a point on the summit of the hill, now called the Diamond, to a gate at the other extremity of each. The strength of these fortifications was tested in the subsequent wars of 1642 and 1688, in each of which the town maintained a successful stand against its besiegers. After a lapse of more than two centuries, the walls still retain, in most parts, their original form and character. The external ditch, indeed, has disappeared. The gates have been rebuilt in a more elegant style of architecture, and two new ones have been added. One bastion has been removed to make way for a butter-market, and another has been appropriated as the site of a pillar commemorative of the military services of the Rev. George Walker during the memorable siege which lasted 105 days; it commenced on the 18th of April 1689, and was raised on the 1st of August following. The cathedral stands within the walls, on the most elevated portion of the hill of Derry. It consists of a nave, divided into a central and lateral aisle, separated by pointed arches. There are four Presbyterian, one Independent, and two Methodist meeting-houses; there are also two Roman Catholic chapels and a large Roman Catholic cathedral. The corporation hall stands in the centre of the Diamond. It is surrounded by a colonnade, with embattled parapet; and the same kind of military ornament surrounds its roof. The other public buildings are,—the court-house, the lunatic asylum, the poor-house, the gaol, the custom-house, the linen-hall, the public library and news-room, the barrack, and the magazine. The bridge is the peculiar boast of Derry. It is built of wood, and extends in length 1068 feet by a breadth of 40. A turning bridge, near the centre, admits a free navigation to vessels going up the river. Walker's Testimonial is a pillar of the Roman Doric order—erected in 1828 by public subscription—surmounted by a statue of that celebrated individual, represented as dressed in canonicals, and armed with the Bible and the sword. Its height is 82 feet including its base; the statue is 9 feet high.

The municipal jurisdiction extends over a space of 3 miles in every direction from the centre of the city. The

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government is vested in a mayor, six aldermen, and eighteen councillors. The income of the corporation, amounting to L.12,000 per annum, arises from tolls on the bridges, tolls on the market, rents of land and shambles, and tonnage and quayage.

The progress of commerce may be estimated from the custom-house receipts at different periods:—

Years.	L.	Years.	L.
1830	74,856	1853.....	123,225
1849	104,991	1854.....	114,526
1851.....	108,194	1855.....	120,561

The shipping of the port of Derry in 1760 consisted of 67 sail, of from 30 to 350 tons. At the conclusion of the last century, the tonnage registered at the port was about 3000, which has since increased to upwards of 25,000 tons. In 1855, 1224 vessels, of 214,990 tons, entered inwards; and 759 vessels, of 171,448 tons, cleared outwards.

The population of the city in 1841 was 15,196; and in 1851, 19,399. (H. S.—R.)

LONG ISLAND, a long narrow island off the E. coast of the United States of N. America, forming part of New York state, and separated from the mainland at its western extremity by two channels, called the Narrows and the East River, the former $1\frac{1}{2}$ mile, the latter $\frac{3}{4}$ of a mile in width. It stretches from W.S.W. to E.N.E., between N. Lat. 40. 33. and 41. 6., and W. Long. 71. 50. and 74. 4., being 115 miles long, by from 12 to 20 miles broad, and containing an area of about 1448 square miles. A low range of hills extends from one extremity of the island to the other, exhibiting on the northern slope an irregular and broken surface, while on the S. the ridge declines more gently to the Atlantic. There are no large streams; and the want of water-power is much felt in the island. The soil is of a light sandy character, generally sterile on the southern coast, but productive at the western extremity, in King's and Queen's County. The coasts are much indented, forming numerous large lagoons on the southern coast, and an extensive inlet at the eastern extremity, which almost severs the island in two. A railroad, one of the first constructed in the state, and originally intended to accelerate the traffic between New York and Boston, traverses it from W. to E. Communication is kept up with the mainland by means of steam ferries at Brooklyn, Fort Hamilton, &c. The island is divided into the three counties of King's, Queen's, and Suffolk. Pop. (1850) 212,637, (1854) about 260,000. (See NEW YORK.)

LONG ISLAND, or *Yuna*. See **BAHAMAS**.

LONG, Loch, an arm of the sea on the W. coast of Scotland, stretching first N. then N.E. from the Firth of Clyde, and separating the counties of Argyll and Dumbarton. It is 20 miles long by from 1 to 2 miles broad. From its centre a branch loch stretches for $4\frac{1}{2}$ miles northwards into Argyllshire, called Loch Goil. The shores of both lochs are mountainous and highly picturesque.

LONG, ROGER, an astronomer, was born in Norfolk about 1680. He was educated at Pembroke Hall, Cambridge, was created a master of arts in 1704, and a doctor of divinity in 1728. He was chosen a fellow of the Royal Society, and vice-chancellor of the university in 1729, and master of Pembroke Hall in 1733. In 1749 he was elected Lowndes professor of astronomy, and in 1751 was appointed to the rectory of Bradwell, in Essex. He was also the rector of Cherryhinton, in Huntingdonshire. At his death in 1770, he bequeathed L.600 to his college. Long is best known as the inventor of a curious contrivance, at Pembroke Hall, for facilitating the study of astronomy. It is a hollow sphere 18 feet in diameter, and capable of containing thirty persons. The inner surface is covered by a map of the heavenly bodies, and represents that portion of the celestial sphere visible in Britain. The entire structure is moved by machinery. Long's chief work is a

Treatise on Astronomy, Cambridge, 1742–64, 1781, 2 vols. 4to. He also wrote a *Commencement Sermon*, 1723; a pamphlet entitled *The Rights of Churches and Colleges Defended*, 1731, 8vo; an *Answer to Dr Gally's Pamphlet on Greek Accents*, 1755; and a *Life of Mahomet*, prefixed to Oakley's *History of the Saracens*.

LONG, St John, was born at Newcastle in Limerick, in 1798. From his father, a person of versatile ingenuity, he inherited a disposition to try his hand at whatever vocation came in his way. At the age of 25, after studying painting in Dublin, he set out for London as an artist. His merit not meeting with due appreciation, he resolved to turn his hand to medicine. In 1826 he acquired great celebrity by his specific for consumption and other diseases generally regarded as incurable. After some time, he was tried for the death of a young lady, a patient, and found guilty of manslaughter. So great was his influence that no less than sixty-three persons of rank appeared in his favour. After realising a large fortune, he fell a victim to the disease which he professed to cure at the age of 36.

LONGFORD, an inland county in the north-western extremity of the province of Leinster, in Ireland, bounded on the N. by the counties of Leitrim and Cavan, on the E. and S. by Westmeath, and on the W. by Roscommon, from which it is separated by the Shannon. Excepting Carlow and Dublin, it is the smallest county in Ireland, comprising an area of 420 square miles, or 269,409 acres, of which 191,823 are arable, 58,937 uncultivated, 4610 in plantation, 364 in towns, and 13,675 are under water. The uncultivated land consists either of heathy pasture, or of flow-bog. The latter may amount to about 30,000 acres, of which about 18,000 acres are susceptible of improvement for cultivation, by a system of perfect draining, followed by a coating of from three to four inches of clay and gravel, which occur abundantly near the edges of most of the bogs. The whole might be considered capable of cultivation; but owing to the expense of conveying gravel from the edge, even by the assistance of railways, the surface cannot be coated with clay at a remunerative price at a greater distance than half a statute mile from the bog edge; but the entire extent might be advantageously drained, by which means, in a few years, coarse pasture would be produced. Including the mountain pasture and a portion of the bogs, this county contains 18,000 acres which may be reclaimed for cultivation, so as to produce corn and green crops; 38,000 acres may be improved for pasture; and 3000 acres are incapable of improvement.

The county, according to Whitaker, was peopled by the tribe of the Scoti, who spread themselves over most of the inland regions. Afterwards, under the name of the Anally, it became the principality of the O'Ferrals. In the reign of Elizabeth, it was made shire-ground, being one of the seven counties into which Connaught was then divided; but it was afterwards transferred to Leinster, of which it still continues to form a part. It is divided into the six baronies of Ardagh, Granard, Longford, Moydow, Rathcline, and Shrule, which are subdivided into twenty-six parishes, all in the diocese of Ardagh, except one, which is in that of Meath.

The diocese of Ardagh, which was founded in the fifth century, was in 1658 united with that of Kilmore, from which it was subsequently separated, and, after being for some time held alone, was united with the archdiocese of Tuam; but according to the recent ecclesiastical arrangements, it is united with the sees of Kilmore and Elphin. No traces of the cathedral are now in existence.

By much the greater part of the surface of the county is level, but in its northern angle it rises into bleak and rugged hills of no great elevation; and some hills also protrude in various parts of the plain country. The general surface,

Long,
St John.
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Longford.

Longford. however, is of considerable elevation, the summit-level of the Royal Canal, which is within the county, being 290 feet above the level of the sea. The only rivers of any size are—the Camlin, which rises near Granard, and flows by the town of Longford into the Shannon near Tarmonbarry; and the Inny, which has its source in Lough Shillin, on the borders of Cavan, passes by the southern border of the county, through a fertile and well-peopled district, and discharges itself, after a winding course, into Lough Ree, being navigable from Ballymahon. There are several lakes within the county, but none of them of great extent. The most remarkable are Lough Gawnagh in the north, Derrylough, Lough Drum, and Lough Bannow. The fine expanse of Lough Ree, on the western side of the county, may be considered as partly belonging to it. It has in it the islets of Innisbofin, Innisclohran, and Innismacsaint. Lough Derrymacar is merely an arm of this lake. The quantity of bog in the county is considerable. Some of the bogs contain deep places, which are known by the name of swallow-holes, and throw up large quantities of water. In 1809, part of the bog near Johnstown burst away from the main body, and moved to a considerable distance, crossing in its passage the river Camlin, the channel of which it choked up, and caused all the adjoining lands to be flooded.

The northern boundary of the great limestone field of Ireland passes through this county. The line of division is marked by the Camlin as far as Longford town, and thence proceeds by Johnstown to Lough Shillin. To the north of this line the formation is of clay slate and greywacké. Isolated hills of sandstone show themselves at Slievegoldry and at Ballymahon, on both sides of the Inny. Indications of iron are abundant in the northern parts. Near Lough Gawnagh very rich iron ore has been observed. Marble of fine colour, and susceptible of a high polish, has been raised from quarries near Ledwithstown.

A great portion of the northern part of the county is of a rough, untractable quality, affording little encouragement for agricultural speculations; but all the more level districts, not covered with bog, are of good quality, the soil being mostly rich, and of easy culture.

The extent of land in the county under each description of crops in 1855 and 1856, was:—

	1855. Acres.	1856. Acres.
Wheat.....	2,253	2,847
Oats.....	38,841	36,893
Barley, Bere, Rye, Beans, and Pease...	328	497
Potatoes.....	16,258	17,262
Turnips.....	2,730	2,800
Other Green Crops.....	936	1,224
Flax.....	262	388
Meadow and Clover.....	20,156	21,036
Total.....	81,744	83,047

The manufactures are confined to those necessary to supply the limited wants of an agricultural population. The principal are linen, frieze, linsey-woolsey, for the garments of men and women, and leather for shoes and harness.

The only vestige of remote antiquity worthy of special notice is a tumulus at one end of the town of Granard, said to have been a Danish rath, and called the Moat of Granard. It is 593 feet above the level of the sea, and commands a view of six or seven surrounding counties. Though several ruins of monastic buildings may still be traced, few memorials of their history have been preserved. The island of Inchimore in Lough Gawnagh, and those of Innisbofin, Innisclohran, and Innismacsaint, in Lough Reagh, were each at some remote period the site of a religious house, now in utter ruin. The castle of Longford, once the mansion of the O'Ferrals, was taken at the commencement of the war of 1641, and the garrison slaughtered after their surrender upon terms. Rathcline, placed in a highly

romantic position near Lanesborough, was dismantled by Cromwell, and burned in the wars between William and James. The castles of Ballymahon, Barnacor, and Castlecor, were built to command passes over the Inny. Of these, the last named has suffered not only from the ravages of time, but from excavations made to discover concealed money, imagined to have been buried in its interior. The seats of the gentry are numerous. Carrickglass on the Camlin, the seat of Chief Justice Lefroy, is a fine residence; as is also Castle Forbes, the seat of the Earl of Granard; and Edgeworthstown will long be noted in the annals of British literature as the residence of the Edgeworth family. This county is also celebrated for having given birth to Oliver Goldsmith, who was born at Pallas, a village near Ballymahon.

The statements of the population at various periods, with the authorities on which they rest, are as follow:—

1760.....	De Burgho.....	25,142
1792.....	Beaufort.....	50,100
1813.....	Parliamentary return.....	95,917
1821.....	Ditto.....	107,570
1831.....	Ditto.....	112,558
1841.....	Ditto.....	115,491
1851.....	Ditto.....	82,350

The proportion of Protestants to Catholics is as one to eight, and the number of Protestant dissenters is inconsiderable. The number of schools and pupils attending them during the week ended 12th April 1851, was:—

SCHOOLS.	No. of Schools.	No. of Pupils.		
		Males.	Females.	Total.
National.....	43	1389	1160	2549
Church Education.....	13	298	284	582
Endowed.....	1	27	3	30
Boarding.....	1	30	...	30
Private.....	52	788	554	1342
Parochial.....	3	58	75	133
Free.....	4	92	101	193
Military.....	1	22	20	42
Mission.....	1	8	9	17
Workhouse.....	4	761	792	1543
Gaol.....	1	22	4	26
Total.....	124	3485	3002	6487

The county of Longford returns two members to parliament. (H. S.—R.)

LONGFORD, the county town, is situate on the River Camlin, in the midst of an extensive plain of mixed pasture, tillage, swamp, and bog land, interrupted only towards the S. by the hill of Fenighfadd, which rises to a height of 200 feet. It contains a Protestant church and a Roman Catholic chapel, a gaol, a court-house, a market-house, a union workhouse, and barracks for cavalry and infantry. It has a tolerable share of inland trade, which has been much enlarged by the extension of the line of the Royal Canal through it. Here are also extensive stores, corn mills, tan-yards, &c. Its population amounted in 1851 to 4614 souls.

LONGINUS, DIONYSIUS CASSIUS, a celebrated Greek critic, was born about A.D. 213. His name, originally Dionysius, was changed for some unknown reason; and, besides the full title given above, he was also called Dionysius Longinus, or Cassius Longinus. According to some, he was born at Palmyra; others think that his intimate knowledge of Syriac, and the fact that his uncle was a native of Emesa, in Syria, indicate that he also was born in that city. From the circumstance, however, that Longinus, in his boyhood, seems to have been under the care and tuition of his uncle Fronto, the famous teacher of rhetoric at Athens, it is most probable that he was an Athenian by birth. On Fronto's death he became his heir; and, from one of his fragmentary works preserved by Porphyry, we learn that, in his earlier years, he travelled much, and thus formed an

Longitude. intimacy with Ammonius Saccas, Origen, Plotinus, Amelios, and other philosophers. Under the instructions of the first two were imbibed his admiration for Plato, which a subsequent familiarity with the works of that philosopher confirmed; and his sympathy with the spirit of the Platonic philosophy, which he everywhere exhibits in the few of his comments on *Plato's Dialogues* that are extant. On completing his education, Longinus fixed his residence at Athens, and devoted the chief part of his time to the instruction of young men in philosophy, criticism, rhetoric, and grammar. His most distinguished pupil was Malchus, whose Syriac name Longinus has changed into the Greek synonym, Porphyry. After sojourning for a considerable period at Athens, where he composed most of his works, Longinus travelled into the East; and on being invited by Queen Zenobia of Palmyra to become her instructor in Greek literature, settled in that city. On the demise of her husband soon afterwards, the queen, assuming the reins of government, appointed Longinus one of her counsellors. In this new capacity he persuaded her to shake off the Roman yoke, and dictated, it is said, a defiant letter to the Emperor Aurelian. This zeal was ungratefully employed by Zenobia as a shield to ward off the punishment of her revolt; for, when Palmyra was captured by the Romans, A.D. 273, Longinus was delivered up and condemned to death by order of the emperor. He met his doom with firmness.

So high did Longinus stand in the estimation of his contemporaries, that Porphyry styled him "the critic;" and the phrase "*κατὰ Λογγίνον κρίναι*" meant "to judge correctly." Not less noted was his erudition, so that Eunapius called him "a living library and walking museum." Of his numerous works, both philosophical and critical, the only one extant is his dissertation *Περὶ ὑψους* (*On the Sublime*), a treatise not more remarkable for the sagacity with which its canons of criticism are framed than for the judicious taste with which the passages adduced in support of these canons are selected from the best authors. The diction of the work, moreover, is a striking example of that forcible and elevated style which he endeavours to teach. Of the philosophical character of Longinus, almost the only note we have is that from Plotinus, who says, that "he was a philologer, but no philosopher." This taunt, however, loses the greater part of its value when we consider that its author probably set up, as his ideal of philosophy, the trifling and whimsical speculations of his own age. Though a pagan, Longinus was acquainted with the sacred Scriptures. In his famous treatise he quotes, as a specimen of the sublime, the passage from Genesis,—“And God said, let there be light, and there was light.” And in one of his extant fragments he ranks Paul of Tarsus, as he styles the apostle, with Demosthenes and the celebrated orators of Greece. Emanations, too, from the spirit of Christianity can be detected in his writings.

The best editions of the treatise *On the Sublime* are those of Pearce, London, 1724, 4to; 1773, 8vo; and of Morus, Leipsic, 1769–73, 8vo. The same work, together with all the surviving fragments of his other works, was published by Toup, with notes by Ruhnken, Oxford, 1778, 1789, and 1806, 8vo; by Weiske, Leipsic, 1809, 8vo; and by Egger, Paris, 1837, 16mo. Longinus has been translated into French by Boileau; into German by Schlosser, Leipsic, 1781; and into English by Smith, 1739, 1800.

LONGITUDE. By the term *geographical longitude*, is meant an arc which measures the inclinations of two terrestrial meridional planes, one of which passes through a known place, as a place of reference, the other through any place whatever. It is sometimes also defined as the distance E. or W. along the equator, of any place from a certain meridian. The selection of a station from which the longitudes of all other places are to be reckoned is en-

tirely arbitrary; British astronomers and geographers have chosen the meridian of the Royal Observatory of Greenwich as their *first meridian*. The French and other continental nations refer the longitudes of all places to the meridian of their principal observatory.

The longitude of a place may be expressed in hours, minutes, and seconds of time, or in degrees, minutes, and seconds of space; if it be given in either, it may be translated into the other. The reason of this is, that the earth revolves on its axis from W. to E. in twenty-four mean solar hours, thereby causing the first meridian to describe during that time a space equal to 360°, and, therefore, in one hour 15°. Hence, if the plane of the first meridian pass at the present moment through the sun, then the meridian of a place 15° west of the former will pass through the sun exactly one hour after; if the place be 15° east of the first meridian, the plane of the former will pass through the sun one hour before the latter. The sun always passes the meridian of any place when highest in the heavens, i.e. at mid-day, or twelve o'clock mean solar time. Wherefore, places lying to the E. of the first meridian will have every hour earlier, but places lying to the W. of that meridian will have every hour later than it; so that if, while the meridian of one place is passing through the sun, the time be known before the meridian of another place pass through the sun, then the longitude of that place from the former is determined, the time being turned into space, at the rate of 15° to the hour. Hence, therefore, places will have E. or W. longitude, according as they lie E. or W. of Greenwich Observatory, the longitude of the meridian of which is zero.

The problem of the longitude may be reduced to this,—Given the hour by calculation at the place of observation, to find the hour at Greenwich Observatory corresponding to the same time; the difference of times gives the longitude of the place from Greenwich. The solution of this problem was attempted in very early times, dating even from the time of the ancient Egyptians, but the results obtained were very inaccurate. These results were deduced from tables of celestial phenomena calculated for a certain meridian, and then the times were compared with the times at which the same phenomena appeared at a different place; actual admeasurement was also employed. But it was not till after the invention of watches that the problem was rendered solvable. Harrison, in the eighteenth century, was the first who gave a *true* solution by a watch; but the first accurate resolution of the problem may be said to date from the discovery by Galileo of Jupiter's satellites, and his tables of their motions. The result of the problem at this period, as well as now, was, as Wolfius has expressed it, that means might be found whereby the art of navigation might be brought to its utmost pitch of perfection.

If the advantages of determining the longitude to a commercial and maritime people be considered, it will not appear surprising that princes and others should have held out high rewards for a true solution of the problem. Philip III., king of Spain, saw its value, and in 1598 offered a reward of 1000 crowns to the person who would solve it. The States of Holland imitated his example by a prize of 10,000 florins. In the year 1714, the British government offered a premium of L.20,000 for any method whereby the longitude might be determined at sea to within 30 miles; L.15,000, if the proposed method would give it to within 40 geographical miles; L.10,000, if it would determine the longitude to within 60 miles. It was also enacted, that a reward of L.5000 would be given to the inventor of any time-keeper which should enable a ship, during a voyage of six months, to keep her longitude to within 60 miles; L.7500 if within 40 miles; and L.10,000 if within 30 miles. If the method were by improved astronomical tables, the reward was to be L.5000, the tables being com-

Longitude. pared with previous observations. France also, in 1716, under the regency of the Duke of Orleans, offered a prize of 100,000 livres. In consequence of these rewards, many and various methods were proposed, the best of which, at least as respects frequency of observation and shortness of calculation, is the method of *Lunar Distances*.

Jean Werner of Nuremberg appears to be the first who proposed, in his *Ptolemy's Geography*, 1514, a method of finding the longitude by the distance between the moon and a star. The lunar method was also recommended by Oronce Finé of Briangon, in his book *De Inveniendis Longitudine*; by Gemma Frisius, in his treatise, *Structura Radii Astronomici et Geometrici*, 1545; by Kepler in his *Rudolphine Tables*; and by Christian Longomontanus in his *Astronomia Danica*, 1622. Gemma Frisius is, moreover, said to have attempted the longitude by a watch some time after 1530. Carpenter, in his *Geography*, 1635, says that the lunar method is to be ascribed to Pierre Applan, a German, born in 1495. John Baptiste Morin, in 1634, attempted to improve the lunar method, and received, in 1645, a pension of 2000 livres; but his *improvements* were useless, as Pascal declared, owing to the imperfect nature of the existing tables.

The tables of celestial observations previous to Flamsteed's time were imperfect and erroneous: those generally used were Tycho Brahe's or Kepler's, and to show that they were of little value in determining the longitude, although invaluable in other respects, it may be stated that Flamsteed's observed differed from Tycho's computed places by 5', 6', or more; and the tabulated distances of the latter differed from the observed distances of the former by 15' or 20', which would cause an error in the longitude of about 15°, or 300 leagues. Tycho's *lunar theory*, and the tables grounded on it, were in error 12' and more. The uncertainty, then, of these tables being known, as well as the paucity of astronomical observations generally, a Frenchman, named Le Sieur de St Pierre, contrived, in 1674, to get his pretensions to the discovery of the longitude brought under the notice of Charles II. of Britain and the court. Commissioners were appointed, and St Pierre's data necessary to work the problem were as follow:—(1.) The heights of two stars, and on which side of the meridian they were; (2.) The heights of the two limbs of the moon; (3.) The height of the pole; all to be given in degrees and minutes; and (4.) The year and day of observation. Flamsteed being in London at the time, was appointed, not only to act as a commissioner, but also to supply the necessary data. St Pierre, having received the data which he required, refused to work the problem, because he alleged the observations given him were feigned. Flamsteed on this wrote to the commissioners, assuring them that the observations were genuine, and at the same time stated, that the longitude could not be solved by the conditions proposed; but if the tables of celestial observations, especially those of the moon, could be rendered more accurate, then the longitude might be determined by them. On the letter being shown to Charles, his majesty was startled at the assertion of the computed places not agreeing with the observed, and said with some vehemence, he must have them observed, examined, and corrected anew for the use of his seamen. It was this simple incident which led to the formation of the Royal Observatory of Greenwich, the foundation of which was laid by Flamsteed on the 10th of August 1675; and it was in that building that Flamsteed laboured for forty-four years, under the most trying circumstances, to correct existing tables, and to commence the *British Catalogue*, one of the noblest monuments of British perseverance. So valuable were Flamsteed's observations to Newton, that they enabled him to form his *lunar theory*, which is now of such consequence in determining the longitude.

From the improvements made in watches by Huygens,

Longitude. Hooke, and others, previous to the year 1714, it was thought that the longitude would be solved by this machine. Hence, after 1714, the best artists applied themselves to the construction and improvement of watches. Henry Sully, an Englishman, but resident at Paris, tried in 1726 to determine the longitude by a *marine watch*, but without success. Julian Leroy, one of his pupils, would appear to lay claim to priority of invention; but it has never been disputed that the honour of solving the difficult problem of the longitude by means of a watch belongs wholly to Harrison. This ingenious workman began, at a very early period, to make experiments on pendulums made of different metals, in order to counteract the effects of heat and cold. In the year 1736 Harrison was brought into notice by a pendulum clock which he had made in 1726, and which, for ten successive years, kept remarkably exact. This clock was tried in a voyage to Lisbon during August 1736, when it corrected an error in the ship's reckoning of 1° 30'. At the special request of the commissioners of longitude, who advanced him money, he continued his experiments on watches from 1737 till 1761, when he produced three watches, or time-keepers,—the third the most accurate, and about 4 inches in diameter. This watch, or chronometer, was tried in a voyage to Jamaica as to its practicability in determining the longitude. The trial was eminently successful; the difference of time as shown by the chronometer indicating Greenwich or rather Portsmouth local time, and the local time of the place, being 4 seconds of time, which is equivalent to 1 nautical mile in the parallel of Jamaica. On the arrival of the vessel at Portsmouth, it was found that the error of the chronometer was only 1 min. 53.5 sec., or 28.375 for the entire voyage, which, in the parallel of Portsmouth, would be equivalent to 18 nautical miles. Since this error was within the limit prescribed by the act, Harrison claimed the full reward of £20,000; but the commissioners, considering the matter in all its detail, came to the conclusion that the watch was not yet sufficiently tried. In order, however, to testify their appreciation of the invention, they gave Harrison a grant of £5000, and requested him to improve the watch still further against a second voyage. This voyage was undertaken, in 1764, to Barbadoes; and that no misunderstanding might ensue, Maskelyne and Green were also sent out to make the necessary astronomical observations at that place. The difference of longitude, as shown by the chronometer and that by astronomical observation, was 43 seconds of time, which is equivalent to 10' 45" of space, or longitude. In consequence of the success attending this and the former trial, the House of Commons ordered one-half of the reward promised by the act of 1714, or £10,000, to be paid to Mr Harrison, the inventor of the *longitude clock*; the other half to be paid him when watches, constructed on principles stated by him, should determine by trial the longitude of any place to within 30 nautical miles. Another condition annexed to the payment of the other £10,000 was, that the inventor should give on oath a full explanation of the principles on which the watch was constructed. This was done most willingly, and Harrison delivered over all his watches to government. The first watch made on Harrison's principles was that by Mr Kendall; it was found to exceed the regularity of the best of its models. This instrument was committed to the care of Mr Wales, in his voyage round the world with Captain Cooke, during the years 1772, 1773, &c., and such was its success, that in 1774 an appeal was made to the House of Commons to order the remaining sum to be paid to Mr Harrison, which was accordingly done. Harrison realized by his invention alone upwards of £24,000.

Several other parties received rewards for their improvements in chronometers, Arnold and Son received £3000, and Mudge £500.

Longitude. Since Harrison's time, remarkable improvements have been made in time-keepers, or *chronometers* as they are now termed; no one sustaining a good character that gains or loses more than a single second in one day.

But while watches were thus gradually being perfected, the tables of celestial motions were also attended to. Halley, on succeeding Flamsteed as astronomer-royal, continued improving what the latter had begun, so that for 1730, and consequently for the future, the *Caroline Tables* were presumed to give the true place of the moon, within the compass of 2' of her motion. But however perfect such tables may be made, they will be useless without a proper instrument with which to take angles accurately at sea. Dr Halley proposed to overcome this obstacle, by using on shipboard a telescope of 5 or 6 feet; but the error in such a case would nearly equal 2°, or under the equator the longitude would be in excess or defect about 40 leagues. But in 1761, Mr Hadley communicated to the Royal Society the nature of the *sextant* which he had then invented. The sextant is an instrument for taking angles at sea with surprising accuracy; its principle depends on the law of the reflection of light. This instrument was tried in several voyages with wonderful success; but its results were most accurate when used with Professor Mayer's *Tables of the Moon*, computed for the meridian of Paris. These tables first appeared in the *Memoirs of Göttingen* for 1742, and a manuscript copy was sent in 1755 by Mayer to the Board of Longitude, setting forth, at the same time, his claim for some one of the rewards which he might be thought to merit. These tables were placed in the hands of Dr Bradley, astronomer-royal, who compared several hundred computed longitudes of the moon with his own observed longitudes, and never found a greater difference than 1'.5. Dr Bradley showed the commissioners the value of these tables. Mayer died in 1762; but having in the interval greatly improved his tables, his widow sent them in 1763 to the Board of Longitude. These are the tables which, in consideration of their value in finding the longitude at sea, were, by act of parliament, honoured with a reward of L.5000, which was paid, in 1765, to Mayer's widow. Dr Maskelyne, astronomer-royal, was at the same time requested to improve and correct them as far as possible, so that they might be compiled, and form the basis of a *British Nautical Ephemeris or Almanac*; and to print the same, in order to make the lunar tables of general utility. The first of the series of the *Nautical Almanac and Astronomical Ephemeris* was published in 1766, under the superintendence of Dr Maskelyne. It was published yearly by the Commissioners of the Board of Longitude. The *Nautical Almanac* has been greatly improved, corrected, and extended, under the able superintendence of Mr Airy, the present astronomer-royal; it is now published four or five years previous to the observations being made at Greenwich Observatory; hence in long voyages the set of tables may be taken out.

In consideration of Mayer having availed himself of Euler's *lunar theory*, the latter received from government L.300.

The several methods for finding the longitude are the following:—

To find the Longitude by a Chronometer.—Suppose that a chronometer is warranted to measure equal portions of time uniformly, and always indicates Greenwich local time; it is evident that, were this instrument carried to any station on the surface of the earth where also the local time is known, the local times of Greenwich and that place can be compared with each other. If the chronometer be carried to any station on the meridian of Greenwich, the chronometer and local time of the place will always coincide; but if it be carried to any station W. or E. of the meridian of Greenwich, then the time as shown by the

Longitude. chronometer will be in excess in the former case, but in the latter in defect of the local time of the place; the difference of local times gives the longitude of the place from Greenwich. The time may be converted into distance, at the rate of 15" to 1 hour. Chronometers can never be made perfect; they require, therefore, to be daily compared with the heavenly bodies, in order to ascertain if their motion has been uniform.

Such is the method of finding the longitude by means of a chronometer; but to show the care and trouble involved in the delicate operation of finding the difference of local times between any two places, it will suffice to state briefly the attempt of Mr Airy, astronomer-royal, to determine the longitude of Valentia on the W. coast of Ireland. Mr Airy considered it necessary to take into account the facility of land conveyance by railways, and of sea conveyance by steamboats. With respect to the former, the route by Bristol and Cork had the preference; but he found those advantages best combined by adopting the route by Liverpool and Kingston. It was at first proposed that the chronometers should be transmitted from Greenwich to Valentia without interruption, save for the purpose of winding them up and comparing them with a clock at Kingston. But Mr Sheepshanks, who acted in concert with Mr Airy, thought that, for the sake of accuracy, the arc of parallel from Greenwich to Valentia should be divided into two parts—that from Greenwich to Kingston, and that from Kingston to Valentia—which was the plan adopted. Thirty chronometers were employed, to be compared with the transit clocks which were set up at each station. The following were the *courses* of these chronometers:—The chronometers left Greenwich for the first time on the morning of 27th June, and reached Kingston for the last time on the morning of 27th July, having made nine journeys from Greenwich to Kingston, and eight from the latter to the former place. The chronometers then left Kingston for Liverpool on the evening of 27th July, and were returned to the former place the last time on the morning of 4th Aug., having made four journeys each way. They then left Kingston for Valentia on the evening of 5th August, and returned to Kingston the last time on the morning of 14th September, having made ten journeys each way. After a short delay, and transmission to Liverpool, the chronometers left that place for Greenwich on the morning of 21st September, and arrived finally at the latter place on the evening of 28th Sept., having made four journeys from Liverpool to Greenwich, and three from Greenwich to Liverpool. It was by this transmission of chronometers from Greenwich to Valentia, that the comparison of the clocks at these two places was made. At each station, moreover, the transits of stars across the meridian were compared with the right ascensions of the *Nautical Almanac* list, using the mean places of the *Greenwich Catalogue* of 1439 stars. By this means, and with the requisite calculations, the inclination of the planes was obtained. The results on the whole are, in time,—

Longitude of Liverpool W. from Greenwich.....	12 ^m 0 ^s .05
Longitude of Kingston W. from Greenwich.....	24 ^m 31 ^s .20
Longitude of Valentia W. from Greenwich.....	41 ^m 23 ^s .23

The whole of the operations, including everything relating to the longitude of Liverpool, Kingston, and Valentia, occupied nearly from the end of June to the end of September 1844.

Mr Airy considered it proper, after all his labour with the transmission of chronometers, to compare the deduced results with that found by geodetic calculation. For this purpose, he made a survey-triangulation, which extended in an easterly and westerly direction from Greenwich to Valentia. From this survey the distance in yards was known between these two places, measuring along an arc of parallel. Knowing, therefore, this distance, as also the

Longitude. inclination of the two meridional planes, the whole parallel passing through Greenwich was computed.

The inferences which Mr Airy deduces from the chronometrical and geodetic results are:—That the verticals at Liverpool and Greenwich are less inclined to each other, or that the earth's surface in England is flatter than accords with geodetic calculation; that the inclination of the verticals at Liverpool and Kingston is, sensibly, precisely the same as that given by geodetic calculation; and that the inclination of the verticals at Kingston and Feagh Main is greater than that given by geodetic calculation, or that the earth's surface in Ireland is more curved than the elements of geodetic calculation imply: but that upon the whole arc the difference of the chronometrical and geodetic results is very small; and, lastly, in latitude $51^{\circ} 40'$ the complement of the logarithm of the number of feet in 1" for an arc perpendicular to the meridian is 7.9928932, or the length of 1" in an arc perpendicular to the meridian in latitude $51^{\circ} 40'$ is 101.6499 feet. (See *Transactions of the Royal Astronomical Society of London*, 1847.)

To find the Longitude by Lunar Eclipses.—Since an eclipse of the moon is visible to one-half of the earth at the same time, this would seem to be an excellent method of finding the longitude. The different steps of the process are,—to compute the time at which an eclipse is to happen at the place of observation, and to compare this time with an accurate chronometer showing Greenwich time; or in the absence of this, the Greenwich time of the happening of the phenomenon must be looked for in the *Nautical Almanac*; or it may be computed by the observer from the lunar tables. But this method of determining the longitude is rarely used, owing to the difficulty of ascertaining the exact time of contact of the penumbra of the earth's shadow with the moon's limb at the beginning or ending of the eclipse. Sometimes, indeed, two observers of an eclipse at the same place may differ more than 2 minutes in noting the time of contact; and hence the error from this cause alone would be about 4 minutes of time, which would be equivalent to nearly 1° of longitude. It was proposed in the *Philosophical Transactions* of 1786 to diminish this source of error, by observing the contact of the earth's shadow with some remarkable spot on the moon's face. But although this method were more accurate, the unfrequency of lunar eclipses at sea renders the method of little use.

To find the Longitude by the Eclipses of Jupiter's Satellites.—Ever since the discovery by Galileo of Jupiter's satellites the observation of their eclipses by their primary has been used as a method of finding the longitude. Tables of these eclipses were constructed by Galileo; and it was the disagreement of these tables with actual observation that led Roemer to the discovery of the gradual propagation of light. (See LIGHT.) The first astronomical solution of the great problem of the longitude really dates from the discovery of these *secondaries*, for the tables of their eclipses were framed on scientific principles. The three interior satellites of Jupiter pass through his shadow, and are eclipsed at every revolution; the fourth, or outer one, at times escapes eclipse, grazes the umbra, or is partially eclipsed. The computed times at which the eclipses are to happen at Greenwich Observatory are noted in the *Nautical Almanac*, published three or four years in advance; so that if these tables are in the hands of any one distant from Greenwich, he has but to observe the eclipse, and calculate the time at which it occurs, to find the difference of the local times between Greenwich and the place of observation, and thus ascertain the longitude. The times of immersion and emersion are noted with much greater accuracy than the contact of the moon's limb with the earth's shadow.

But before these eclipses can be observed with ac-

curacy, a telescope of considerable power must be used; Longitude. and as it is extremely difficult to direct a telescope properly on shipboard, the method is practically useless at sea. But again, particular care is required in observing; for two observers at the same place, with telescopes of different magnifying powers and apertures, seldom agree within a second or two of each other; hence the mean of the results of immersion and emersion should be taken. But another source of error is, that no two or more observers will agree as to the instant of the total immersion, or of the complete emersion of the satellite; hence the only case in which this method is practically useful in determining terrestrial longitudes is that in which the instant of immersion and emersion are observed with the same telescope, and by the same observer, since in this manner he will find the precise instant of the satellite's opposition to the sun.

To find the Longitude by Signals.—If the difference of longitude between two places be small, it may be easily found by means of the bursting of a rocket, the oxy-hydrogen lime-ball light, or the explosion of gunpowder fired from the one place at a preconcerted time, and observed at the other place; the local times of these places being accurately ascertained, the longitude is known. These artificial signals, when fired from an elevated spot of country, may be seen, when the atmosphere is in a proper state, at distances varying from 30 to above 100 miles. An observer, therefore, distant from the spot at which the rocket or other signal is exposed, has only to observe the time when he sees it, and afterwards compare this time with the time when the rocket was set up, the difference of times giving the longitude of the one place from the other; if at one of the places the Greenwich time corresponding to that of the event is known, the longitudes of the places from that meridian are also known. It is here supposed that the gradual propagation of light leads to no appreciable error in the small distance between the two places.

If the distance between the two places be considerable, and if a rocket sent up at the one place cannot be seen at the other place the longitude of which is required, then a series of signals must be made and noted by observers, placed at stations intermediate to the two extreme places.

Thus, let A and E be the two places, the longitude between which is required; B, C, and D, observers at intermediate stations; *w, x, y, z*, signal places, and let these places be arranged in the following manner:—

A *w* B *x* C *y* D *z* E.

Before the signals are sent up at the previously arranged hours from *w, x, y, z*, the local times of the places along the whole line AE are supposed to be accurately known. Let then a signal be sent up at *w*, and noted at A and B, the difference of times of observation, as noted by the chronometers at those two places, will give the longitude AB. Let, again, another signal be sent up at *x*, and the time of appearance noted at B and C, then the difference of times, as shown by the chronometers, gives the longitude between B and C; and therefore between A and C. Similar results will be found when signals are sent up from the stations *y* and *z*, to be observed at C and D, D and E; and in this manner, the whole longitude AE between the extreme stations can be found. The longitude found on this principle, and the mode of deducing the most advantageous results from a combination of all the observations, is fully stated by Sir John Herschel in the *Philosophical Transactions*, 1826, on the *Difference of Longitudes of Greenwich and Paris*.

Natural signals might be adopted in place of artificial ones, especially if they occur in sufficient number. Thus, Halley is said to have first suggested the idea of employing

Longitude. shooting stars, or meteoric stones, for determining the differences of longitude by simultaneous observation. Dr Maskelyne, in 1783, drew the attention of astronomers to these phenomena, and distinctly pointed out their application to this subject. The idea was revived in 1802 by Benzenberg; but so long as these shooting stars were regarded as casual and irregular phenomena, it was not to be expected that they could be of much service in geodetic measurements. Since, however, these meteors are known to be regular in their appearance, especially on the 9th and 10th of August, and on November 12th and 13th; and since they are visible over extensive regions of the earth's surface, they may be advantageously applied, by previous concert and agreement between distant observers to watch and note them. Mr Cooper has thus employed the meteors of the 10th and 12th of August 1847 to determine the difference of longitudes of Markree and Mount Eagle, in Ireland. Those of the same epoch have also been used in Germany for ascertaining the longitudes of several stations, and with very satisfactory results.

To determine the Longitude by Moon-culminating Stars.—This method consists in finding the increase of the moon's right ascension in the intervals between the passage of the moon over the meridian of Greenwich and over that place whose longitude is required. It is necessary to find the right ascension of the moon's bright limb, and of a star selected on, or as near as possible to, the moon's parallel of declination, and not differing much from her in right ascension at the two meridians; then, the moon's increase of right ascension being known, the difference of longitude is determined.

Let T , for example, be the time when the moon's enlightened limb transits the meridian of any place distant from Greenwich; t the time of passage of a star over the meridian of the same place; let also n be the error of the clock in the course of the day; then $24 + n$ will be the interval of time elapsing between two successive transits of the same star, and $24 + n : T - t = 360^\circ$: the difference of right ascension of the moon's bright limb and the star at the instant of the limb being on the meridian; and if to this the right ascension of the star be added, the right ascension, $= a'$, of the moon's bright limb when on the meridian is determined. Now the proper stars to be observed for this purpose, as well as the right ascension of the moon's bright limb when on the meridian of Greenwich, are given for every day of the year in the *Nautical Almanac*, from which the daily increment of right ascension may be determined. Let a be the right ascension of the moon's bright limb when on the meridian of Greenwich, e the increment of right ascension in the time between two successive transits over the same meridian; then, whilst the moon, by her relative motion, separates from the meridian of Greenwich by an angle of 360° , its real motion in right ascension is e ; and whilst it separates by an angle equal to the difference of longitude, the motion in right ascension is $a' - a$; and, therefore, supposing the change in right ascension uniform, the required longitude $= \frac{a' - a}{e} \cdot 360^\circ$. Where greater accu-

racy is required, the difference of longitude corresponding to the increase of right ascension $a' - a$, must be determined by interpolation. This method is considered one of the best which can be adopted for determining the longitude of distant places, when the observer, furnished with a transit instrument, can obtain a landing. (*Hymer's Astron.* 1840.)

To find the Longitude by the passages of the Moon over the Meridian.—If the sun, moon, and a star be supposed to be on the meridian of Greenwich at the present moment, then in the next instant the three bodies will be separated from each other,—the star will be found most advanced to the W., the moon least advanced from the meridian, while the sun will occupy an intermediate situation. The meridian itself also leaves these bodies, but will approach

them with different degrees of velocity, and reach each of Longitude. them after certain intervals of time. It will pass the star after the lapse of a sidereal day, or after having described 360° ; it will pass the sun at the end of a solar day, or after having described $360^\circ 59' 8''.3$; and it will pass the moon after a time $=$ the sum of 24 hours and the moon's *retardation* for that time, or after having described an angle $=$ the sum of 360° and the moon's right ascension in 24 hours. This always takes place in the interval between two successive transits of the moon over the same meridian. So also a spectator on a different meridian will notice similar effects, but less in degree, and less proportional to the distance of his from the first meridian. The sun's right ascension will be increased (or the separation of the sun from the star), but less than $59' 8''.3$; the moon's right ascension (or the separation of the moon from the star) will also be increased to the spectator, but less than its increase between two successive transits; consequently there will be an excess of increase of the moon's right ascension above that of the sun's, but less than the excess that takes place between two successive transits of the moon over the meridian of Greenwich. Wherefore, since the spectator at the second meridian may compute the respective increments of right ascension of moon and sun that take place between two successive passages of the moon over the meridian of Greenwich; then, since he is also able to compute, by actual observation, the right ascensions of sun and moon at the times of their passage over his own meridian, he has determined the longitude. The spectator may choose the sun and a star, the moon and a star, or the moon and sun; the two former are preferable. (*Woodhouse's Astron.*, 1821.)

To determine the Longitude by means of Eclipses of the Sun, or by Occultations of Stars by the Moon.—One of the most exact methods, and at the same time the simplest, for finding the longitude, is by means of solar eclipses and occultations. If the commencement and ending of an eclipse of the sun, or the immersion and emersion respectively of a star from the enlightened and dark limb of the moon or of a planet, be observed, it is only necessary to deduce the true time of conjunction for Greenwich and also for another place of observation; the difference of the times gives the difference of meridians, and therefore also of longitudes. Kepler employed this method, and it is one of the simplest. (*Kepler, Astron. pars opt.*) The only inconvenience of this method is the large amount of calculation required.

To find the Longitude by Lunar Distances; that is, by the distance of the Moon from a Star or the Sun.—This method supposes that the face of the heavens is a dial-plate, the stars marks apparently irregularly distributed upon it, and the moon the hand moveable among them and round the earth as a variable centre. Three things require particular notice about this clock;—1. The intervals of space separating the principal and secondary marks from one another and from the moving hand—the moon. 2. The exact amount of the eccentricity of the earth, the centre of motion of the hand. 3. The proper motion of both moon and earth at any part of their respective paths. When these data are properly known, the time as shown by this clock may be read. The time as pointed out on this dial-plate is generally read at Greenwich Observatory, and tabulated in the *Nautical Almanac*, four or five years beforehand, for every three hours. But this clock is supposed to be accurately seen by a spectator at the centre of the earth, and consequently, since observers are on the surface, the moving hand being rather near, and the marks immensely distant from the earth, it is evident that this moveable hand will be displaced, or undergo a *parallax* with respect to the stars, which must be allowed for, ere the true place is known which she occupies in space, as seen from the centre of the earth. A reduction must also be made to the

Longitude. centre of the earth. The necessary steps for computing the longitude by this method are,—(1.) Find by a sextant the distance between a star and one of the moon's limbs; or, between the limbs of the sun and moon; add or subtract, in the former case, the semi-diameter of the moon, and in the latter, the sum of the semi-diameters of sun and moon, which gives the distance of the moon's centre from the star, or that between the centres of sun and moon. (2.) When two observers are making the observations, one should take the above distance, while at the same instant the other takes the altitude above the horizon of the moon and star, or of the moon and sun. In the case of one observer, he must take the altitudes immediately before and after the distance has been found, and allow for the changes of altitude which may have taken place in the intervals between their observations and that of the distance. (3.) The true altitudes are derived from the apparent and observed, by correcting the latter for refraction and parallax; the *apparent* altitude being the observed altitude corrected for the dip of the horizon and instrumental errors. (4.) The observed is also an apparent distance, and must, like the altitude, be corrected for parallax and refraction in order to find the true distance. (5.) Since the true distance is found, the hour, minute, &c., of Greenwich time corresponding to it will also be found by the tables of the *Nautical Almanac*. (6.) The local time of the place of observation is now to be computed from the true and corrected altitude of a star or the sun, the sun's or star's N. polar distance, and the latitude. (7.) The difference between this local time and Greenwich time gives the longitude.

To find the Longitude by the Electric Telegraph.—This beautiful and ingenious application of electricity for recording astronomical observations is the latest method of finding the longitude, and was proposed by Mr Bond of the Cambridge Observatory, United States. Mr Airy, of the Greenwich Observatory, has also carried it into effect with great improvements. During the summer of 1847 experiments were made on the electric telegraph connecting New York, Philadelphia, and Washington, for the purpose of determining the differences of longitude between these three cities. A competent observer was stationed at each observatory. A continuous wire connected the three cities, so that telegraphic signals might be exchanged between any two of them at pleasure. In some of the first experiments, signals were exchanged between Philadelphia and Washington, but it was found impossible to transmit signals from Jersey City to Washington, the power of the battery being inadequate to that distance. This, however, was remedied on the 29th of July, when twenty clock signals were given at Jersey City, and recorded both at Philadelphia and Washington; twenty signals were given at Philadelphia and recorded at Jersey City and Washington; and twenty signals were given at Washington and recorded at Jersey City and Philadelphia. Thus the comparison of the three clocks was decisively made in a remarkably short period of time. The success of these experiments amply repaid the first unsuccessful efforts. The difference of longitude between Jersey City and Philadelphia is $40^m 3^s$; and between Jersey City and Washington, $12^m 3^s$; omitting in each case the small fractional part of a second, which was ultimately allowed for. The distance between New York and Washington is 225 miles, and the time required to make a communication pass betwixt these two places was a fraction of a second which cannot be measured.

Soon after a system of telegraphic wires was erected on the principal English lines of railway, Mr Airy had them put in communication with Greenwich Observatory, his object being to give *Greenwich time* on a given day to the United Kingdom. It was at first proposed that a ball should be dropped from the upper part of Greenwich Observatory, so as to touch a spring communicating with all the tele-

graphic wires in the kingdom, and then, by the striking of a bell, give instantaneously true Greenwich time to Liverpool, Manchester, and all the northern towns. But this method was found impracticable, owing to the non-completion of all the lines with Greenwich. On the 1st of December 1847, true Greenwich time was communicated directly from the observatory to the several stations of the London and North-Western and Midland lines in connection with it; but to all other stations of these lines special messengers were sent with chronometers indicating true Greenwich time. Hence, since Greenwich time is used over the whole of the United Kingdom, if the local time of any place be known, its longitude from Greenwich is also determined.

Since submarine cables connect Greenwich with Brussels and Paris, and these again with the principal cities of Europe, Mr Airy was very lately enabled to correct the latitudes and longitudes of their observatories. Hence, also, when the submarine cables which are to connect India, Australia, and America, with Greenwich, shall have been completed, the true longitudes of the principal cities of the world will easily be determined.

LONGOBARDI. See **LOMBARDS**.

LONGOBUCO, a town of Naples, province of Calabria-Citra, situate in a valley 21 miles N.E. of Cosenza. The inhabitants are chiefly employed in the neighbouring argentiferous lead mines, and in the burning of charcoal. Pop. 8000.

LONGOMONTANUS, CHRISTIAN, a Danish astronomer, the son of a poor ploughman, was born in 1562. His original surname, Severin, was changed into Longomontanus, an epithet derived from the Latinized name of his native village Langoberg. Compelled from a very early age to earn his bread by field labour, he received little or no school education. However, by the aid of the minister of the place, he instructed himself, and at the same time fostered so keen a desire for learning, that at the age of fifteen he stole away from his family, and entered the College of Wiborg. Here he remained for eleven years, and though forced at the same time to gain a scanty support by toil, progressed rapidly in his studies, especially in mathematics. He then removed to Copenhagen, and there becoming known, through his high attainments, to the professors of the university, he was recommended by them as assistant to Tycho Brahe. With this celebrated astronomer he continued for eight years engaged in astronomical calculations and observations, and living successively at the island of Høene and at the castle of Benach, near Prague. From this latter place, Longomontanus set out in 1601, and after travelling by a circuitous route, arrived at Wiborg in 1603. There he was immediately appointed superintendent of the gymnasium. In 1605 he became professor of mathematics in the university of Copenhagen. Longomontanus died in 1647.

His principal works are, *Astronomia Danica*, 1622, 4to; *Systematis Mathematici, Part I.*; *Cyclometria e Lunulis reciproce demonstrata*; *Geometriae Quasita XIII. de Cyclometria rationali et vera*; *Rotundi in Plano seu Circuli Absoluta Mensura*; and *Inventio Quadraturæ Circuli*. In this last treatise an attempt was made to square the circle, which was proved by Dr John Pell to be unsuccessful. Yet, at the end of an animated dispute with this mathematician, Longomontanus remained unconvinced of his error.

LONGTOWN, a market-town of England, Cumberlandshire, on the left bank of the Esk, 9 miles N. by W. of Carlisle, and 3 miles from the Scottish border. Its streets are regularly laid out and clean. The inhabitants are mostly employed in hand-loom weaving and agriculture. Weekly markets on Monday and Thursday; the former for butter and bacon, the latter for grain. Pop. (1851) 2142.

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Loo-Choo
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LONGUS, a Greek sophist, the author of the pastoral romance entitled *Ποιμενικά τὰ κατὰ Δάφνην καὶ Χλόην*, and commonly called *The Loves of Daphnis and Chloe*, lived in the fourth or fifth century. Regarding his life nothing is known. His work is admired for its natural elegance and simplicity, but occasionally betrays a want of purity both in taste and in morals. It was first printed by Columbanus at Florence in 1598, 4to. The best editions are those of Boden, Leipzig, 1777, 8vo; Villosion, Paris, 1778; Schæfer's, Leipzig, 1803, 8vo; Passow, Leipzig, 1811, 12mo; and Seiler, Leipzig, 1843, 8vo. Courier's edition, published in 1810, contains a passage which he found in the manuscript in the Laurentian library at Florence, and which fills up a gap apparent in all the other manuscripts. Longus was translated into English by Thornley, London, 1657, 8vo; and by Le Grice, London, 1804, 12mo.

LONGWY, a fortified border town of France, department of Moselle, near the Chiers, a tributary of the Meuse, 33 miles N.N.W. of Mentz, and about a mile distant from the Belgian frontier. It is divided into an upper and lower town. The former is situate on an elevation once occupied by a strong castle, which was destroyed, and replaced in the time of Louis XIV. by a town fortified by Vauban. The latter, which contains most of the manufactories, lies underneath the southern escarpment of the upper town. The chief public buildings, including the town-hall, the principal churches, and an hospital, belong to the upper town; while the manufactures of calico, Delft ware, and porcelain, are carried on in the lower town. Longwy has sustained many sieges. In 1792 it was taken by the Prussians under the Duke of Brunswick, and again in 1815 by the allies under the Prince of Hesse Homburg, after a gallant resistance. Pop. 3374.

LONS-LE-SAULNIER, the capital of the department of Jura in France, and a town of considerable importance, is situate on the Solvan, not far from its source, in an agreeable valley surrounded by the mountains of the Jura, whose lower slopes are clad with vineyards. It is clean and well built, possesses tribunals of first instance and of commerce, a library, and a college; it has a handsome church and museum of antiquities, and is ornamented by beautiful fountains. At one end of the town is a brine spring or well, 60 feet deep, supplying the saltworks, *Salins* (whence the ancient name *Ledo Salinarius* and the modern *Saulnier*). These saltworks are situate at Montmorot, about a mile from the town, whither the brine is conducted by a wooden canal, with immense evaporating houses for strengthening the brine before it is boiled, in order to spare fuel. The tanworks of the place are important, and there is a tolerable trade in salt, iron, building timber, wine, cheese, &c. Pop. 9410.

LOO-CHOO ISLANDS, a group consisting of about 36 islands in the North Pacific Ocean, between Japan and Formosa. They lie between N. Lat. 24. and 28. 40. and E. Long. 127. and 129. They are small and insignificant, with the exception of Great Loo-Choo, which extends about 60 miles in an N.E. direction, and has an average breadth of about 10 or 12 miles. This island is entirely encircled by coral reefs, which, however, do not appear above water. Along its centre runs a chain of hills, covered for the most part by forests of pine, and broken at intervals by abrupt crags that bear seeming traces of volcanic action. Their slopes in many parts are covered with terraced gardens and fields of grain, and are watered by streams led in artificial channels. The valleys are well watered, fruitful, and covered with a luxuriant vegetation. The villages are almost completely hidden among groves of bananas, bamboos, banyans, and pines. Rows of trees overarch the roads, line the streets of the chief towns, and form a screen in front of the houses. There are large rich fields of rice, intermingled with crops of sugar-cane, wheat, millet, sweet potatoes,

plums, oranges, cotton, and tobacco. The principal surface-rock is argillaceous, and is intersected at intervals by peculiar ridges of limestone. The disintegration of the former rock forms the chief ingredient of the rich adhesive soil which is most prevalent in the island. Situate within the range of the trade-winds, Loo-Choo has in general a mild climate. The domestic animals are,—geese, ducks, fowls, pigs, goats, a small species of black ox, and a nimble and hardy breed of horses. Wild boars abound in the extensive forests. A striking trait in the zoology of the island is the scarcity of birds in the woods.

The dress, customs, but especially the language, of the Loo-Chooans, indicate a Japanese origin. Suspicious of strangers, they are, nevertheless, gentle and hospitable. They are diminutive in stature, and in complexion resemble the Chinese. They have dark eyes and black hair, plaited into a knot on the crown of the head; and the character of the hair-piu determines the sex as well as the rank of the weaver. The women wear single and the men double hair-pins. Among the higher classes, these articles are made of gold or silver; among the lower, of brass, lead, or pewter. The highest grade of society includes the spies and officers of the government, and also the mechanics and small merchants. Immediately below them are the literary class, who pass the most of their time in smoking tobacco and drinking tea, and are supported by the subordinate rank of field-labourers. The meanest order are the public slaves, possessing no personal freedom and no civil rights. Subjected from mere infancy to perpetual toil, closely watched by spies, and prevented from all intercourse with strangers, the lower classes are spiritless, uncomplaining drudges, subsisting upon two-tenths of the produce they reap from the soil. In the same slavish labour the women also are engaged. The Loo-Chooans of one village seldom intermarry with those of another. Their dead are treated with great respect; and their capacious tombs, built of white limestone, appear at a distance like cottages chequering the hill-sides. The huts are generally placed in the middle of well-cultivated gardens. Their floors, covered with thick mats, are used both for sitting and sleeping. A great part of the industrial population are engaged in weaving the grass-cloth that forms the ordinary garment, and in turning wooden implements and covering them with lacquer. There are also manufactured tobacco, sugar, and small quantities of salt. Saki, a strong intoxicating liquor, is distilled from rice. All the processes of agriculture, and especially that of irrigation, are carried on with great success. The entire trade of the island is with Japan, and consists chiefly of sugar, saki, and grass-cloth. Napakiang, situate in the S. part of the island, is the chief port. The government of Loo-Choo seems to consist of an oligarchy of *literati* subject to Japan. Learning is limited to a knowledge of the Chinese character and the Confucian classics, and the principal means of disseminating it is home education. A few regular schools, however, are scattered over the island, and at Napakiang there is an advanced seminary. The Loo-Chooans have no native literature. Their religion is a hybrid between Confucianism and Buddhism. Concerning the history of the island nothing certain is known, but tradition reports that it was once subject to three distinct sovereigns.

LOODIANA, in Hindustan, a town of Sirhind, is so called from having been founded by the Lodi tribe of Afghans. The population, consisting chiefly of Mohammedans, has been estimated at about 20,000 souls. Here Shah Zeman Dooranee took refuge after he had been deposed, deprived of sight, and exiled from Cabul; and his brother, Shah Shooja, also here found an asylum until his departure, in 1838, to attempt the recovery of the sovereignty of Afghanistan. The district, of which this town is the chief place, lapsed to the British on the failure of heirs to the late ruler in 1836. It has an area of 725 square

Loodiana.

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miles, and a population of about 120,000. The town of Loodiana is situate in Lat. 30. 55., Long. 75. 54.

LOOE, EAST and WEST, two villages of England, S.E. coast of Cornwall, on the Looe estuary, connected with each other by a stone bridge, 15 miles W. of Plymouth. They are of considerable antiquity, and at one time were of importance as seaports, having sent twenty ships to the siege of Calais in the time of Edward III. The east town was a borough, returning two members to parliament from the reign of Elizabeth, and the other returned the same number from the time of Edward VI., till both were disfranchised by the Reform Bill. The present villages are made up of irregular lanes, of antique houses, overlooked by beautifully-wooded hills, which almost surround them on every side. The inhabitants are principally engaged in pilchard fishing, and in the shipment of copper and granite brought by canal from Liskeard. Pop. (1851), East Looe, 970; West Looe, 746; total, 1716.

LOONGHEE, a town of the Burman empire, situate on the E. side of the Irrawaddy, Lat. 19. 39., Long. 94. 59.

LOPEZ DE VEGA. See VEGA.

LORARII, amongst the Romans, officers whose business it was, with whips and scourges, to compel the gladiators to engage. The *lorarii* also punished slaves who disobeyed their masters.

LORCA (the ancient *Eliocroca*), a town of Spain, province of Murcia, and about 40 miles S.W. of the town of that name. This town is situate on the southern skirt of the Sierra-del-Caño, on the summit of which is a fortress still in a state of defence. It is divided into an upper and lower town by the River Guadalentin, only since 1847 crossed by a bridge. Formerly communication was cut off during the annual floods. The upper and more ancient part of the town consists of wretched and narrow streets; the lower is more spacious and extensive. The principal buildings are,—the collegiate church of St Patrick, a beautiful structure of the sixteenth century; the former college of the Immaculate Conception, since 1837 incorporated with the university of Granada; the episcopal palace of the diocese of Cartagena; and the churches of Santiago and Santa Maria. On account of the long droughts, the scanty waters of the Guadalentin are collected above the town in two reservoirs for the purpose of irrigation. In the spring of 1802 one of them burst and caused great damage. The environs of the town are woody and picturesque, and there are several fine parks and promenades. The manufactures are chiefly soda, soap, saltpetre, linen, silk, oil, and paper. The trade is of no great importance, consisting in articles of local production—barley and wheat in good years, soda, and some other articles. There is an annual fair from the 8th to the 23d September, chiefly for the sale of cattle, and especially of mules, which are employed in the husbandry of the district. The Sierras contain minerals, which are worked to a considerable extent; some years ago great hopes were excited, and much capital embarked, in the lead mines, terminating in considerable losses. The town is remarkable in history as having been the key of Murcia during the Moorish wars; being situate on the frontiers of Granada, it was often taken and retaken. During the French occupation in 1810, the inhabitants suffered greatly from military violence, having taken up a position of decided hostility towards the invader. The painters Juan de Toledo, Pedro Camacho, and Baltasar Martinez were natives of Lorca. Pop. 40,469.

LORCHA, the name of a coasting vessel used in the Chinese seas. One of those vessels sailing under British colours was, in 1856, boarded by the Cantonese, had her flag pulled down, and her crew forcibly carried off. Governor Yeh refused either reparation or apology, and this led to the conflict between Britain and China during the same year.

LORD, a title of honour given to those who are noble

either by birth or by creation. The title is also by courtesy given to all the sons of dukes and marquises, and to the eldest sons of earls; and it is likewise a title of honour bestowed on those who are honourable by their employment, as Lord Advocate, Lord Chamberlain, Lord Chancellor, and the like. The word is Saxon, but abbreviated from two syllables into one. "The etymology of the word," says Coates, "is well worth observing; for it was composed of *hlaf*, a loaf of bread, and *ford*, to give or afford; so that *Hlaford*, now *Lord*, implies a giver of bread, because in those ages such great men kept extraordinary houses, and fed all the poor."

LORDS, HOUSE OF. See PARLIAMENT.

LORETO, a city in the province of Macerata-e-Camarino, in the Papal States, standing on a hill 3 miles from the Adriatic, on the E. coast of Italy. Though but a small city, consisting of little more than one long and narrow street, yet it has obtained a wide celebrity as a religious sanctuary. The Santa Casa, or Holy House, sacred to the Madonna, and said to be her birthplace, the scene of the Annunciation and Incarnation, as well as the place where the holy family found shelter after their return from Egypt, was, as the story goes, transported from Nazareth by the hands of angels to the coast of Dalmatia in 1291, and was afterwards, in 1294, conveyed in the night, in the same miraculous manner, to a laurel grove near Loreto. From this laurel grove, or from Lauretta, the person to whom it belonged, the place received its present name. To afford accommodation to the pilgrims which flocked thither, the foundations of the present town were soon laid. One side of the piazza, in which the sanctuary is situate, is occupied by the convent of the Jesuits, the other by the splendid palace of the governor, built after the design of Bramante. In the middle is the statue of Pope Sixtus V., who, in 1586, fortified the place against the attacks of the Turkish pirates, for whom the treasures of the sanctuary had considerable attractions. This piece of art is the work of Calcagni of Recanati. On the third side of the square stands the church called the Chiesa della Santa Casa. Over the grand entrance is a full-length bronze statue of the Virgin and Child, by Girolamo Lombardo. The chief external ornaments are three superb bronze doors, divided into compartments, with bas-reliefs illustrating events in the history of the Old and New Testaments. These exquisite performances are the work of the sons and pupils of the celebrated Girolamo Lombardo of Siena, and were finished during the pontificate of Paul V. The campanile, designed by Vauvitelli, exhibiting a combination of the four orders, is of great height, and is surmounted by an octagonal pyramid, with a bell weighing 22,000 pounds. The great attraction of the church, however, is the Santa Casa, a small brick building of the rudest kind, 13½ English feet high, 27½ in length, and 12½ in breadth. It has a door on the north side, and a window on the west. Over the fireplace is a statue of the Virgin, of Lebanon cedar, black with age, said to be sculptured by St Luke. The statue is resplendent with jewels, and the value of the relics and treasures must be very great. All sorts of offerings, from all classes of worshippers, are to be met with—from the richest jewels to a cannon-ball of the warlike Julius II., or a wedding-dress of the king of Saxony. The marble casing which incloses the Santa Casa is one of the most remarkable monuments of the finest age of art. The design was by Bramante, and the sculptures by Sansovino, Girolamo Lombardo, Bandinelli, Giovanni da Bologna, Guilielmo della Porta, Sangallo, &c. It has four fronts of white marble, and the sculptures are in relief. These wonderful works were for the most part begun, if not finished, by Sansovino. Vasari pronounces his representation of the Annunciation, on the western front, an *opera divina*. The next object of attraction is the bap-

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Lorraine.

tistery, a splendid work in bronze, ornamented with bas-reliefs relating to baptism. The chapels of the various naves are superbly ornamented with reliefs, arabesques, fresco paintings, and mosaics from the paintings of the great masters. Besides its church, Loreto contains little that is worthy of notice. It has a population of 9700.

LORICA, a cuirass, or coat of mail, worn by the Roman soldiers, was made of various materials. One formed by numerous folds of linen was used rather in hunting than in warfare. The ordinary kind consisted of a skin or a piece of strong linen, covered with small plates of iron which resembled, both in their shape and in their manner of overlapping each other, the scales of a serpent or a fish. Sometimes cuirasses or hauberks, composed entirely of iron rings linked together, were worn by the Roman *hastati*. A less flexible but more impervious defence was the cuirass made of hard leather or of metal, and consisting of two parts (the one covering the breast and abdomen, and the other the back), united by hinges and leathern thongs.

LORIENT, one of the five great naval ports of France, and the principal town in the arrondissement of the same name in the department of Morbihan, is situate on the northern shore of the Bay of Biscay, where the rivers Scarf and Blavet, after mingling their waters, fall into the Bay of St Louis. It is a large and flourishing town, strongly fortified, tolerably well built, but not very clean, standing in an angle between two creeks, one of which forms the naval the other the mercantile port. The port, which is large and commodious, is walled off from the town, thereby excluding all view of the water from the inhabitants. It is the seat of a maritime prefecture, of a civil tribunal, of a tribunal of commerce, of a college, and of a school of naval artillery. The dockyard is the first in France for the building and equipment of ships of war; there is accommodation on its slips for the simultaneous construction of thirty ships of war. It has an arsenal, a park of artillery, engineering works, masting-sheds and forges, &c. There is a good trade in sardines, marine stores, iron, wax, honey, &c. The town is quite modern. Founded by the French India Company in the reign of Louis XIV., in 1664, it was not till the time of the Duke of Orleans that the company took full advantage of the accommodation of Lorient. The greater portion of the town was then built, and the port fortified. In 1745 it contained thirty-five frigates, besides a very great number of ships, averaging from 900 to 1200 tons burden. In the comparatively short space of thirty years Lorient had risen to the first rank of towns. On the dissolution of the company in 1770, it was made one of the stations for the French navy. Its population and shipping declined during the unsettled period of the Revolution, but since the peace of 1815 it has been more than restored to its former activity. Pop. 25,700.

LORN, a division of Argyllshire. See ARGYLLSHIRE.

LORRAINE is the corrupted form of *Lotharingia*, *Lothair-regne*, *Lotharii-regnum*, or kingdom of Lothaire. The son and successor of Charlemagne, Louis the Pious, divided the empire between his three sons; Lothaire, Pepin, and Louis. Subsequent to this division, he had, by a second marriage, a son named Charles. Louis the Pious wished to make a new distribution of his dominions, which should include this Charles. The wish led to an insurrection on the part of the three elder brothers, and to the temporary deposition of Louis the Pious. The mother of Charles was desirous of securing the empire for her son, but failing in this, she united with Lothaire, to the exclusion of his younger brother, Louis. Pepin was at this time dead. The old and imbecile emperor being restored to the throne, agreed to make Lothaire and Charles his sole heirs. On the death of the emperor, however, Lothaire found himself opposed by his brothers Louis and Charles, and the result of the bloody battle at Fontenay, in which 100,000 lives

are said to have been sacrificed for three unworthy princes, Lorraine. compelled Lothaire to agree to the terms imposed on him by his brothers. According to these terms, Lothaire was to retain the imperial title, but he was to possess only Italy and a territory which reached from the Mediterranean to the Netherlands, and which was partially bounded by the Rhine, the Rhone, the Meuse, and the Scheldt. Louis received Germany, and Charles willingly accepted France for his portion. The treaty of Verdun, which established these terms, was concluded in 843. The territory out of Italy, which was assigned by that treaty to the Emperor Lothaire, is said to have taken from him the name of Lotharingia. This, however, is an error. The district above described was a portion of the empire, and was subsequently split into the kingdoms of Austrasia and Burgundy. Among the political arrangements which followed the confusion supervening on the demise of Lothaire, the most important was that subdivision of territory between his heirs, by which his son Lothaire II. was invested with sovereign power over the districts between the Meuse and the Rhine (excepting certain cities on the banks of the latter river), the Scheldt and the Meuse, and some contiguous "counties." This district was the true Lotharingia, of which King Lothaire, son of the Emperor Lothaire, was the first sovereign. A glance at the map will show that this territory was so situate that, if its monarch gave offence, it could be easily invaded on the sides of either Italy, Germany, or France. On the other hand, Lorraine could give its support to either of its neighbours against the others. One consequence of this position was that the country was for centuries a brand of discord between the German empire and the kingdom of France.

Early in the tenth century, on the death of Louis II., the last German emperor of the blood of Charlemagne, Lorraine was recovered by the French king, Charles the Simple. Under that monarch we meet with the first *Duc beneficaire* of Lorraine. This was no other than that Reynier (Reginald or Raguiner) whose system and policy have been so pleasantly transmitted to us in the exquisite satire, *Reineke Fuchs*. Reynier's son, Gislebert, succeeded to the ducal stewardship. Sanguinary contests ensued between Germany and France; and finally, a division of the prize being agreed upon, that portion known as Upper Lorraine became a fief of the empire in the year 960, to be governed by dukes receiving their nomination from the kaiser. This species of administration lasted eighty years, when the Emperor Henry III. founded a line of hereditary dukes in the person of Albert of Alsace. This line, which commenced in 1044, flourished during seven centuries, at the end of which time Lorraine was finally annexed to the French crown, and Francis, the twenty-sixth duke from the Alsatian (whose genealogy partial heralds have traced from Hector, and more modest builders of races from Dagobert) exchanged the duchy of Lorraine for that of Tuscany, took the hand of Maria Theresa, and gave to the imperial house of Austria the name of Hapsburg-Lorraine.

A more famous line of dukes never challenged admiration. Occasionally we find one weary of his glory. Thus, after Albert, Gerard, Thierry I., and Matthew I., had successively enjoyed their ducal state, we meet with the astute Simon II., who, after twenty-two years of renown and responsibility, laid down his ducal cap, and ended his days in a monastery. His coronet was joyously worn by his nephew Ferry, or Frederick I., whose successor, Thibaut the Handsome, wore it more joyously still, but less happily, ending a gay life by poison, mixed for him by the hand of a favourite and ungrateful mistress. His brother and successor, the terrible Matthew II., is remembered for the summary manner in which he suppressed all desire to commit acts of injustice on the part of local governors by skinning one offender alive. Ferry II., in 1298, received

Lorraine. an accession of sovereign power in the imperial sanction to coin his own money. The second Thibaut reduced the authority of the aspiring Lorraine nobles as vigorously as Richelieu subsequently crushed that of the proud aristocracy of France. The third Ferry, surnamed the Wrestler, gave asylum in his duchy to the fugitive Templars, flying from the vengeance of other sovereigns. He is otherwise remembered as being the first of the Lorraine dukes who was a decided partizan of France. It was the ambition of all these dukes to obtain the title of king. Raoul, who followed Ferry the Wrestler, acquired the lordship of Guise, in Picardy, by his marriage with Mary of Blois; but this alliance with France was founded more on policy than affection. This "paragon of Lorraine dukes" was not unknown to our forefathers, for he was among the bravest of our foes counted among the dead on the well-stricken field of Cressy. Still better known to the English was his successor John, godson of John, King of France. John left his dukedom a prey to the luxurious nobles and to the peasantry, who massacred those nobles because of their licentious cruelty, and Duke John joined his fortunes with those of his royal godfather. Like him, the duke became our prisoner at Poitiers, hunted in our English woods, sojourned in our English castles, was now at large, anon under strict restraint, and was not released, even by the peace of Bretigny, under a less modest ransom than 30,000 livres.

Then ensued the period of disputed successions, the history of a portion of which is familiar to English readers who have perused the *Anne of Geierstein* of Sir Walter Scott. Charles, the son of our prisoner John, died without male heirs. His daughter, Isabella, was married to René d'Anjou, "Duke of Bar, King of Naples, Sicily, and Jerusalem," by whom the ducal coronet of Lorraine was claimed. René is famous for his lack of good fortune, his empty titles, and his love of poetry and minstrelsy. He was unable either to sustain the claim of his wife to the sovereignty of Lorraine, or to help his daughter, Margaret of Anjou, Queen of England, in her attempt to recover the crown of her husband, Henry VI. René and Isabella left the disputed coronet of Lorraine to be worn by their son John II., who was wiser than his father, and still more unfortunate. John's son, Duke Nicholas, was an exquisite dancer, but a very indifferent duke. His death left the seat of authority to be occupied by René II., but it was claimed by Charles, Duke of Burgundy, for the Count of Vermandois. The contest which arose is one of the principal features in Scott's romance, already named, and it ended unsuccessfully for the Burgundian by his defeat at Nancy, and his death in the marsh near the city. When his body was discovered there, the gentle René took the frozen hand, and exclaimed, "God have your soul, cousin, although you have caused me many a pain and sorrow!" René II. refused to confiscate the property of any of the adherents of Charles in Lorraine; and of all the rich spoil of the Burgundian camp, he retained only a crystal vase, out of which he drank, after the funeral of Charles, "to the oblivion of vengeance." When René died, in 1508, his wife Philippa took the veil in the convent at Pont à Mougeon. At the solemn ceremony, her youngest son, twelve years of age, placed in her hand the symbolic wax-light, and burst into tears as he turned from his mother, who for the next fifty years humbly signed herself "Sister Philippa, poor earth-worm." Of the good duke, René II., it is unnecessary to say more here than that from him sprang another line of dukes, of which we shall briefly speak at the close of this article, namely, the dukes of Guise.

Duke Antony, the eldest son of René II., has received the equivocal praise of Brantome, for many fine qualities and reputable virtues. He was French by education and inclination. His ducal coronet passed to the brows of three successive dukes, Francis, Charles, and Henry, before

a lineal succession was interrupted by the lack of male heirs at the decease of the last-named ducal sovereign. Henry was succeeded in 1614 by his nephew and son-in-law, the great Duke Charles, the most famous and most unfortunate of his house. He was renowned for his gallantry in the field and in lady's bower, and he prided himself on this double reputation. In the Thirty Years' War, he took the side of Germany against France, a partnership which for a time cost him his dukedom. His reconciliation with France did not induce him to consider the designs of the government of that country with less dread or suspicion. He evinced his antagonism by entering the Spanish service, and in that service he carried on war against the French crown, after the peace of Westphalia in 1648 had caused a cessation of hostilities between France and her other adversaries. But Charles found his worst foes amongst his latest friends, and his freedom of speech was exercised at the cost of his personal liberty. For some audacious criticism, the Spaniards put him under arrest in Brussels, transferred him to close captivity in Antwerp and Toledo, but released him in 1659, when Louis XIV. concluded the peace of the Pyrenees. The French monarch procured the enlargement of the duke on terms which made of the latter a very obsequious servant. His obsequiousness, however, went farther than the stipulations required of him; and when his nephew and heir, Charles Leopold, declined to enter into a marriage proposed to him by the duke, the latter forwarded a despatch to Louis XIV., which the French monarch received as he was enjoying the gay delights of the fair at St Germain, in 1661. When Louis had read the missive, he joyously remarked that he had obtained a more precious prize than could be found in the fair. The despatch from Lorraine contained an offer to make over the duchy to France after the death of Charles, on condition that the princes of the House of Lorraine should be reckoned among the princes of the blood-royal of France. When Charles Leopold heard of the offer, he fled to the emperor for protection. His uncle became the slave of Louis, and when Charles attempted to free himself from the galling yoke in 1670, he was driven out of his duchy by French troops. He died a soldier in the imperial service in 1675. There were difficulties in the way of the annexation of Lorraine to France which neither Louis nor the able Colbert could surmount. It is a singular circumstance, too, that during the early period of the sway of Duke Charles he was a proud assertor of his independence of France. He repaired to Versailles, indeed, to do homage for the dukedom of Bar, which was on French territory, but when the ceremony was concluded, he remarked that he hoped no one would construe the act as an acknowledgment of vassalage. The chancellor of King Louis expressed, in his turn, a hope that no chicanery was intended; at which the haughty duke looked at the legal gentleman, and asked if, by chance, he mistook him for a lawyer!

Charles Leopold only nominally reigned from 1675 to 1690. He might have returned to Lorraine, but he refused to accept the terms allowed him by the peace of Nimeguen. He made his name famous by his deeds in the wars of that period; and the recovery of the dukedom which was denied to him, was realized in the person of his son, Leopold Joseph, by the terms of the peace of Ryswick, in 1697, after Lorraine had been more than a quarter of a century in the possession of the French. The experience of his predecessors rendered Leopold Joseph wise. He loved peace rather than war; was respected equally by Germany and France, and while he cultivated the friendship of the former, he cemented his alliance with the latter by marrying Elizabeth Charlotte, daughter of Philip, Duke of Orleans. He died in 1729.

It seems paradoxical to assert that the glory of this ambitious house was consummated by the downfall of the

Lorraine. duchy. Such, however, is the remarkable fact. The son of Leopold Joseph was Francis Stephen, the last duke. He was popular, gentle, very much of a German by education, a moderate traveller, and was the lion of the London season, at the gay parties of 1731. Of the wars and political struggles of this period we cannot speak farther than as they influenced Lorraine. The possession of the duchy became necessary for the security of the French frontier. Cardinal Fleury finally effected the desired end. Francis married Maria Theresa, exchanged Lorraine for Tuscany, and, with his bride, ascended the imperial throne of Germany. The great hope of the House of Lorraine was thus accomplished. Maria Theresa and Francis could alike trace their descent from Gerard of Alsace, the nephew of the first duke of the hereditary line; and on grasping the sceptre of the kaisers they might have quoted, as fulfilled, the device of their race, *Spes adhuc restat avorum*. They were, as before noticed, the first of the line of Hapsburg-Lorraine.

The old duchy did not immediately revert to the French crown. Among the unseptrated monarchs of the time there was Stanislaus Leczinsky, who had been carried to the throne of Poland by Charles XII., and who was driven from it by Charles's enemies. Louis XV. married the daughter of Stanislaus, and gave the duchy, with all its privileges, to her father, in life-interest. The new Duke of Lorraine passed the most pleasant of lives under the protectorate of the worst of kings. He kept a brilliant court; governed with remarkable wisdom; was alternately religious and licentious; made of Nancy a city of parks and palaces; drank joyously the Tokay wine sent to him by Francis; cooked little dishes of his own invention, for which he is still gratefully remembered; dabbled in literature; wrote maxims for daily conduct, which embrace the wide distances between duty towards God and watchfulness against damp shoes; and, after a reign or residence of twenty-eight years, from 1738 to 1766, was burned to death by the ignition of his dressing-gown as he was stooping to light his pipe at his own fire.

After his decease Lorraine became a province of France; but the annexation was not carried into effect without various riots, in which the Lorraine women were especially conspicuous. As a province, it disappeared in the French Revolution, when provincial governments, with all their heavy oppressions, ceased. The ancient province was broken up into departments, and that part of the old kingdom of Lothaire is now divided into the departments of the Meurthe, the Meuse, and the Moselle.

The story of Lorraine would be very imperfect without some notice of the branch of Guise. Towards the end of the fifteenth century, René II. sent his fifth and youthful son Claude into France, to push his fortune. The boy grew up to manhood; served Francis I. with his sword; carried the double cross of Lorraine triumphantly over many a field, and acquired such power, that although Francis had made him Duke of Guise, the king warned his successor against the ambition of such men as the duke and his brother, the famous Cardinal John. It was the daughter of this duke, Mary, who married James V. of Scotland, and became the mother of Mary Stuart.

If these two Guises were the terror of all Protestants, still more so were Francis, the second duke, and his able but unscrupulous brother, Cardinal Charles. Side by side they governed France; revived her glory; impoverished the people, and enriched themselves. They overcame all political opponents; lived with a splendour which was unknown at court, and sealed their reputation—the first, by capturing Calais from the English; the second, by his sanguinary persecution of the Reformers. The reputation of the duke during the reigns of Henry II. and Francis II. was only equalled by that of his brother; and the kingdom was

never so much at the mercy of individuals as when it was brilliantly misruled by Duke Francis of Guise and Cardinal Charles of Lorraine. The duke was shot by Poltrot at the siege of Orleans; the cardinal survived to the reign of Henry III. Meanwhile, there succeeded to the dukedom Henry of the Star (Le Balafre), who was perhaps the most redoubtable antagonist that the Reformers ever had, as he was the most formidable subject ever possessed by helpless sovereign. To him and to Cardinal Charles may be traced the authorship of the plan carried out in that never-to-be-forgotten day of massacre—the day of St Bartholomew. When Charles IX. had passed away, the great struggle for power commenced between the new king, Henry III., and the Guises. It was a struggle for very existence, and in it the Guisards had the sympathy of the people, always excepting the Huguenots. The history of the horrors of the struggle comprises the darkest pages in the history of France. It was not closed when Henry III. got his namesake of Guise into his power at Blois in 1588, and there had him cowardly assassinated in the very bed-chamber of the king. The bloody struggle was only brought to an end when the sister of the murdered duke, Ann of Montpensier, put a knife into the hand of the Dominican, Clement, and he, inspired by her beauty and her promises, went and plunged the weapon into the bosom of the last of the Valois kings of France.

From this time the fortunes of Guise suffered retrogression. The fourth duke, Charles, escaped from his captivity at Tours, and joined the league against that over-landed monarch, "Henri Quatre." The triumph of this Bourbon king reduced the duke to comparative retirement. Cardinal Richelieu drove him into exile in the reign of Louis XIII., and this worthless duke was succeeded by his son, the more worthless Henry, who surrendered the dignity of a cardinal to assume the honours and responsibility of a dukedom. It was this libertine who, in 1647, headed the expedition by which, for a time, he succeeded Masaniello on the throne of Naples. After a life of great vicissitudes, he died, in 1664, a sort of "gold-stick-in-waiting" at the French court. Being childless, he was succeeded by his nephew, Louis Joseph, a youth who died of smallpox in 1671, and who bequeathed the once proud title of Guise to his infant son, Francis Joseph, who, in his turn, died of the same disease, the seventh and last of the Dukes of Guise, in the year 1675.

With the prestige of this house its pretensions did not expire. The French memoirs continually reveal to us the petty court quarrels and the silly struggles for precedence at state balls, carried on at court by ladies and gentlemen who could trace their descent from some younger branch (and there were many of them) of the House of Lorraine. The last of the race connected with the line of Guise was that Prince of Lambesc, colonel of cavalry, who, in one of the street riots in Paris, which, in 1789, were preludes to the Revolution, struck a rioter with the flat of his sabre, and for this assault upon the people was driven out of France, three centuries after his great ancestor, Claude, had entered it from Lorraine. The last of the Guises found a refuge at Vienna, where the heir of the elder branch of Lorraine held the imperial sceptre. The present Emperor of Austria is the representative of this ancient race; and he, as if unwilling to give up all connection with the old ducal province which has been so long annexed to France, still reigns supreme over a few square yards in Nancy, the old capital of the province. Those few yards are comprised within the walls of the church wherein are ranged the cenotaphs of all the dukes of Lorraine, and near which lies the body of one of whom Nancy is as proud as of her dukes—Callot, the great French engraver. The ecclesiastical staff of this edifice is in the pay of the Emperor of Austria, as representative of the ancient ducal family. The

Lossini
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Lot.

edifice is said to be Austrian property; and while no repairs are made therein but at Austrian cost, so no appointments are concluded but under Austrian approval. Such is the last shadow of the symbol of authority over the once powerful dukedom of Lorraine. Of the race which once held sway therein, the younger branch, that of Guise, has become extinct; but the heir of the elder line occupies an imperial throne at Vienna, where he upholds a policy that would have been despised by Lothaire. (J. D-R-N.)

LOSSINI. See OSERO.

LOSTWITHIEL, a market-town of England, county of Cornwall, on the River Fowey, 5 miles S.S.E. from Bodmin. Its streets are narrow and roughly paved; and its houses are generally built of stone, and roofed with slate. The principal building is the parish church, a structure of the fourteenth century, surmounted by a spire, and containing a curiously ornamented old font. During the civil war, having been used as a barrack by the parliamentary troops, it was injured by an explosion of gunpowder. Near the church is the site of the ancient palace of the earls of Cornwall, now occupied by the stannary prison. There are also three dissenting chapels. Many of the population are employed in tanning, lime-burning, and the woollen manufacture. A considerable trade is carried on in lime, coals, iron, and timber. About a mile from the town are the fine ruins of Restormel Castle, another palace of the earls of Cornwall. Lostwithiel once returned two members to Parliament, but was disfranchised by the Reform Act. Pop. of parish (1851) 1053.

LOT, a department of France, formed from Quercy, part of the old province of Guyenne, is bounded on the N. by the department of Corrèze, on the E. by those of Cantal and Aveyron, on the S. by that of Tarn-et-Garonne, and on the W. by those of Lot-et-Garonne and Dordogne. It is situate between N. Lat. 44. 13. and 45. 5., and E. Long. 1. and 2. 10. It is 65 miles long by 35 broad, and has an area of 2168 square miles. The department is drained by two navigable rivers; the Lot in the S., from which the department takes its name, and the Dordogne in the N. The watershed of these two rivers is formed by a branch of the mountains of Auvergne. The Lot flows into the Garonne, and receives the Selle on its right bank near St Cirq. The Dordogne receives the Cère on its left. The principal minerals are coal and iron. The mountainous districts yield marble, granite, limestone, alabaster, millstones, and lithographic stones, and the valleys fuller's earth. The chief places of mineral wealth are—Miers, La Garde, and Gramat. Industrial manufactures have made little progress. There are some iron-works, potteries, and tile-kilns, and manufactories of coarse woollen stuffs, brandy, and paper. There is a small trade in those articles, besides wine, corn (which is pretty abundant), hides, salt, and groceries. The department is almost entirely agricultural. Wheat, maize, barley, and oats, are raised in the valleys and plains; and in the stronger soils, hemp and tobacco. The best wines are those of Cahors and Grand-Constant. The white mulberry is grown for production of silk, and truffles and plums are plentiful. Horses, mules, asses, cows, sheep, swine, and goats are numerous and of tolerable quality. The rivers abound in fish, of which the most noted are the eel and the carp. The department of Lot has three tribunals of first instance under the court of appeal of Agen, a tribunal of commerce at Cahors, a lyceum, two colleges, and a normal school.

The principal town of the department is Cahors, with a pop. of 13,350. Lot has three arrondissements, subdivided as follows:—

	Cantons.	Communes.	Pop. in 1851.
Cahors	12	127	118,515
Figeac	8	112	94,345
Gourdon	9	73	83,364
Total	29	312	296,224

Lot-et-Garonne
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Lotteries.

LOT-ET-GARONNE, a department of France, formed chiefly of the old province of Guyenne, besides small portions of Condomois and of Lomagne, is bounded on the N. by the departments of Gironde and Dordogne, on the E. by those of Lot and Tarn-et-Garonne, on the S. by that of Gers, and on the W. by those of Landes and Gironde; between N. Lat. 44. and 44. 45., and W. Long. 0. 10. and E. Long. 1. 3. It is 63 miles long and 55 broad, and contains an area of 2067 square miles. It receives its name from the rivers Lot and Garonne, which traverse it in a westerly direction, and unite near the town of Aiguillon. The Garonne receives as tributaries the Baise and the Dropt; the former joining it opposite Aiguillon, the latter below La Réole. Another principal river is the Gers. Those rivers are, for the most part, navigable, or are rendered so by means of canals. Steamers ply between Bordeaux and Agen, and a railway has been projected from Bordeaux to Certe. The chief mineral productions are iron, gypsum, building-stone, and marl. The department possesses, as industrial establishments, a manufactory of tobacco at Tonneins, and one of beautiful sail-cloth at Agen. The remaining articles of manufacture are flour, linen, cotton, pottery, iron, glass, lime, paper, ropes, and leather. There is a considerable trade in those articles, as well as in agricultural produce, which is rich and abundant. The valleys of the Lot and Garonne are remarkably fertile and beautiful. The low grounds yield wheat, maize, rye, hemp, and tobacco; the upper slopes are covered with vines, figs, and plums. The N. of the department is rather barren. The climate is very healthy. A considerable number of horses, mules, asses, cattle, sheep, pigs, and goats are reared. Geese and game are also abundant. Lot and Garonne forms the diocese of the Archbishop of Agen, and has five consistorial churches of the Calvinistic persuasion. It has a court of appeal at Agen, four tribunals of first instance, three tribunals of commerce, and five colleges.

The principal town is Agen, with a pop. of 14,987; and the department is divided into four arrondissements, subdivided as follows:—

	Cantons.	Communes.	Pop. in 1851.
Agen	9	72	84,092
Marmande	9	96	101,044
Nérac	7	62	60,818
Villeneuve-d'Agen	10	82	95,391
Total	35	312	341,345

LOTHIAN, a name given to three counties of Scotland, —Haddingtonshire, Edinburghshire, and Linlithgowshire; otherwise called *East, Mid, and West Lothians*. (See the articles on these different shires.)

LOTTERIES, in their highest application, are institutions for raising the revenue of a country by granting to those who voluntarily contribute the chance of obtaining a reversion of part of the money collected. This reversion is determined by lot. The practice may be traced back to the Romans, who were accustomed, at least in the days of the empire, to enliven their festivals with the distribution of tickets uniform in appearance, but entitling the holders to receive articles of various value. Instead of granting largesses to the leaders of the Plebs, the Emperor Augustus frequently distributed his gifts on the same principle; and Heliogabalus has the merit of devising in sport a plan, frequently resorted to in fraud to avoid the penalties against lotteries in England, of making prizes really worthless take the place of blanks. In the middle ages the same practice prevailed at the banquets of feudal princes, who distributed their presents economically, and without the fear of jealousy, by granting lottery tickets indiscriminately to their friends. The practice soon descended to the merchants; and in Italy, in the sixteenth century, this became a favourite mode of disposing of their wares. In 1580 the "Lotto" of Florence was established for the necessities of

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the state, and the example was quickly followed throughout Europe. The first lotteries with numbered tickets were instituted at Genoa. Mercantile lotteries were established in France under Francis I. in 1539, and a tax levied on each ticket; but these were supplanted in 1660 by lotteries of money, under the direct control of the king. The first lottery established in England was drawn in 1569. It consisted of 40,000 lots, which were sold at 10s. each. The prizes were pieces of plate; and the profits were devoted to the repair of certain harbours in the kingdom. The printed plan of this scheme is still in possession of the Antiquarian Society of London. In 1612 a lottery was granted in behalf of the Virginia Company; and in 1680 the same privilege was accorded to a contractor who undertook to supply London with water. From this time forward the spirit of gambling increased so rapidly, and grew so strong, that in the reign of Queen Anne, private lotteries had to be suppressed as public nuisances. The first parliamentary lottery was instituted in 1709; and from this period till 1824, the passing of a lottery bill was in the programme of every session. Up till about the close of the eighteenth century, the prizes were generally paid in the form of terminable, and sometimes of perpetual, annuities. Loans were also raised by granting a bonus of lottery tickets to all who subscribed a certain amount. This gambling in annuities, however, despite the restrictions of an act passed in 1793, soon led to an appalling amount of vice and misery; and in 1808 a committee of the House of Commons urged the suppression of this ruinous mode of filling the national exchequer. In October 1826 the last public lottery was drawn in Britain. In France state lotteries have been abolished, but they still exist in most of the continental states; and although demonstrably a source of loss to those who embark in them, they are upheld as a very ready mode of procuring money from the poor, the miserly, and the adventurous. The Hamburg lottery affords the most favourable representation of the system, as in it all the money raised by the sale of tickets is redistributed in the drawing of the lots, with the exception of 10 per cent. deducted in expenses and otherwise. In the United States lotteries were established by congress in 1776, but, with the exception of the southern states, heavy penalties are now imposed on persons attempting to establish them. Private lotteries are now illegal at common law in Great Britain and Ireland; and penalties are also incurred by the advertisers of foreign lotteries. Some years ago, it became common in Scotland to dispose of merchandise by means of lotteries; but this is specially condemned in the statute 42d Geo. III., c. 119. An evasion of the law has been attempted by affixing a prize to every ticket, so as to make the transaction resemble a legal sale; but this has been punished as a fraud, even where it could be proved that the prize equalled in value the price of the ticket. This decision rested upon the plea that in such a transaction there was no definite sale of a specific article.

In 1844 art-unions began to be established in Britain; and as the principle on which they are founded involves that of the lottery, their operations, which are in reality illegal, were immediately suspended by order of government. In the following year, however, an act was passed to indemnify those who had embarked in them for the losses which they had incurred by the arrest of their proceedings; and since that time, they have been tolerated under the eye of the law without any express statute being framed for their exemption.

LOTTI, ANTONIO, one of the great founders of the Venetian school of musical composition, was born at Venice about 1665, and died there in 1740. He studied music under Giovanni Legrenzi, and in 1693 became first organist of St Mark's, a position which he held till he was appointed chapel-master of that cathedral in 1736. In 1718 he was called to Dresden, in order to compose an opera for the

Elector of Saxony. He returned to Venice the same year, and then devoted himself to the study of music for the church. According to his continental critics, the style of his music is clear and expressive, and he possessed peculiar skill in writing parts for voices smoothly and melodiously—a rare and difficult branch of musical composition. In his madrigals and church music, he was considered superior to all other composers of his time. Most of his church music was deposited in the library of St Mark, and little of it published. He composed nineteen operas for the theatre. In 1705 he published at Venice a collection of his vocal duets and trios, and madrigals for four and five voices. One of these madrigals—“*In una siepe ombrosa*”—Bononcini (Handel's opponent in London) had the folly and impudence to publish as his own. This imposture was detected and exposed in 1732 and Bononcini having thus lost all credit, besides having become intolerably insolent and overbearing, quitted England for the continent in the following year. Latrobe, in the second volume of his *Selections*, gives a “*Qui Tollis*,” and, in the third volume, a “*Gloria in excelsis*,” by Lotti.

(G. F. G.)

LOTUS, a very famous plant amongst the ancients, but the name is applied to several different species. Fée signalizes eleven. The most celebrated is that from which the *Lotophagi* (or lotus-eaters) were designated. It grew in the Syrtic region of Africa, and is described by Polybius as a thorny shrub, with berries about the size of an olive, which were at first white, but afterwards acquired a red tinge. The taste of these resembled that of dates, and was supposed to have the property, when eaten, of causing strangers to forget their native country. Hence the proverb of “tasting the lotus,” as applied to those who travel far and neglect their own land. Modern travellers and botanists identify the plant now referred to as the *Zizyphus lotus*, found in Tunis and other parts of Africa. Park describes the berry as very sweet and affording a liquor, as was the case with the ancient lotus. When the fruit was ground into meal, baked into cakes, and dried in the sun, he found it to be delicious to the taste. It is the opinion of Munby, however, that the true lotus tree of the ancients is the *Nitria tridentata*, found in the desert of Soussa, near Tunis, producing a succulent fruit having stimulating qualities.

The lotus of the Egyptians is the *Nelumbium speciosum* of botanists (or sacred water-bean), supposed to have been the Pythagorean bean, from which he charged his followers to abstain. The blue species, often found sculptured on the walls of Egyptian temples, is, in all probability, the *Nymphaea caerulea*. Both the seed and the root of the former were used for food by the inhabitants. The plant appears frequently in the hieroglyphic representations of the rites of Isis and Osiris, to whom it was sacred, and was regarded as an emblem of the creation of the world from water. It was considered symbolical of the Nile, as the Indian lotus was of the Ganges.

LOUDON, JOHN CLAUDIUS, a famous writer on horticulture, was the son of a farmer in the neighbourhood of Edinburgh, and was born at Cambuslang, in Lanarkshire, in 1783. After attending a public school in Edinburgh, he was apprenticed, at the age of fourteen, to a nurseryman and landscape gardener in that city. Meantime he had become intimate with the theory of horticulture, as well by diligent private study, as by attending the classes of botany, chemistry, and agriculture, in the university. In 1803 he repaired to London, and through the high testimonials which he bore, soon obtained abundance of employment. Bent upon improving the inferior system of agriculture in England, Loudon in 1806 rented, conjointly with his father, a farm in Middlesex, and in the ensuing year published a pamphlet, entitled *An Immediate and Effectual Mode of Raising the Rental of the Landed Property in England*. The success attending his new vocation induced him to

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take a lease of the larger farm of Tew Park, in Oxfordshire. There he also established an agricultural college. After amassing by his enterprise a fortune of L.15,000, he set out, in 1813, on a tour, and having travelled in Sweden, Russia, Poland, and Austria, returned to England in 1814. The knowledge of foreign horticulture he thus obtained was still further enlarged by a visit to France and Italy in 1819, and formed an important part of his *Encyclopædia of Gardening*, published in 1822, with numerous woodcuts. A second edition of this great work appeared in 1824. Less successful, his elaborate treatise *Arboretum et Fruticetum Britannicum*, 1838, was sold slowly, and involved its author in a debt of L.10,000 to the printer, the stationer, and the wood-engraver. While toiling assiduously at this work, Loudon was also editing four monthly periodicals—an amount of activity extraordinary in a man whose right arm had been amputated in consequence of disease, and whose constitution had been seriously impaired by rheumatic fever. Enfeebled still more by this labour and its attendant anxiety, he yet continued his studies as unweariedly as ever, and immediately before his death in 1843, was engaged in a work entitled *Self-Instruction for Young Gardeners*. In addition to the works already mentioned, Loudon wrote—*Observations on the Formation and Management of Useful and Ornamental Plantations*, 8vo, Edinburgh, 1804; *A Short Treatise on some Improvements lately made on Hot-houses*, 8vo, Edinburgh, 1805; *A Treatise on Forming, Managing, and Improving Country Residences, and on the Choice of Situations*, 2 vols. 4to, London, 1806; *Encyclopædia of Trees and Shrubs*; *Encyclopædia of Agriculture*, 1825; and *Encyclopædia of Cottage, Farm, and Villa Architecture*, 1832. He also edited *Encyclopædia of Plants*, 1829.

LOUDUN, a town of France, capital of a cognominal arrondissement in the department of Vienne, situate on an elevation between the Dive, Creuse, and Martiel, 32 miles N.N.W. of Poitiers. Its streets are well laid out, and a beautiful promenade now occupies the site of an old fortress, destroyed in the beginning of the seventeenth century by order of Cardinal Richelieu. Some cloth, linens, and common lace are manufactured here; and a brisk trade in oil, white wine, and walnuts is carried on. This town was one of the first in France to embrace the reformed religion, and soon became a stronghold of the Protestant party. In 1634 it was the scene of the disgraceful execution of Grandiere, curate of Loudun, who was burnt at the stake by command of Richelieu. Pop. (1851) 4457.

LOUGHBOROUGH, a market-town of England, in Leicestershire, and a station on the Midland Counties' Railway, about 9 miles N.N.W. from Leicester. It is lighted with gas, and consists of five principal streets, meeting near the centre of the town, and lined with houses mostly built of brick. The chief buildings are,—the old parish church; the new church of Emmanuel; and Burton's school—a well-endowed institution, possessing two exhibitions at Jesus College, Cambridge. There are also other schools, several dissenting meeting-houses, a literary and philosophical society, a theatre, barracks, and a Roman Catholic convent. The principal articles of manufacture are, woollen and cotton hosiery, laces, and shoes. The trade of the town is much facilitated by the Loughborough canal that connects it with the River Soar. Market-day, Thursday. Pop. (1851) 10,900.

LOUGHREA, a market-town of Ireland, county of Galway, on the N. side of Loughrea Lake, about 20 miles E.S.E. from Galway. With the exception of the houses that skirt the Dublin and Galway road, the town is ill-built, and consists of narrow and irregular streets. It has a parish church, recently rebuilt, three Roman Catholic chapels, a nunnery, and a Carmelite friary, founded in 1300 by Richard de Burgh, Earl of Ulster. There are also bar-

racks, a union workhouse, and a bridewell. The inhabitants are chiefly occupied in tanning, brewing, and the linen manufacture. Market-day, Thursday. Part of the old wall that fortified the town still remains. Pop. (1851) 5238.

LOUHANS, a town of France, capital of a cognominal arrondissement in the department of Saône-et-Loire, on the left bank of the Seille, which is here navigable. The town is composed of antique and grotesque-looking houses, and its streets are irregular and dirty. From its position, however, between the Saône valley and Switzerland, it has gained a certain commercial importance. It has a number of flour-mills, and an extensive trade in cattle, horses, and grain. Pop. (1851) 3785.

LOUIS, the name of many kings of France. Louis I., surnamed "Le Débonnaire," was born in 778, succeeded his father Charlemagne in 814, as King of France and Emperor of the West, and died in 840. Louis II., surnamed "The Stammerer," was born in 846, succeeded his father, Charles the Bald, in 877, and died in 879. Louis VI., called "Le Gros," the son and successor of Philip I., was born in 1078, ascended the throne in 1108, and died in 1137. Louis VII., son of the preceding, was born in 1120, succeeded his father in 1137, and died in 1180. Louis IX., canonized as St Louis, was born in 1215, succeeded his father, Louis VIII., in 1226, and died of a pestilence in 1270. Louis XI., the son and successor of Charles VII., was born in 1423, ascended the throne in 1461, and died in 1483. Louis XII., the son of Charles, Duke of Orleans, was born in 1462, succeeded Charles VIII. in 1498, and died in 1515. Louis XIII., surnamed "The Just," was born in 1601, succeeded his father, Henry IV., in 1610, and died in 1643. Louis XIV., the son of the preceding, was born in 1638, ascended the throne in 1643, and died in 1715. Louis XV., the great-grandson and successor of Louis XIV., was born in 1710, was declared king in 1715, was crowned in 1722, and died in 1774. Louis XVI., the son of Louis the Dauphin, was born in 1754, succeeded Louis XV. in 1774, and was beheaded in 1793. Louis XVIII., the brother of the preceding, was born in 1755, assumed the title of King of France and Navarre in 1795, ascended the throne in 1814, and died in 1824. Louis Philippe, the son of the Duke of Orleans, was born in 1773, was elevated to the throne in 1830, abdicated the crown in 1848, and died in 1850. (See FRANCE.)

LOUIS, Sr, a city and river port in the state of Missouri, U.S. of North America, is situate on the right bank of the Mississippi, about 20 miles below the junction of the Missouri, and 1194 miles above New Orleans. N. Lat. 38. 37. 28., W. Long. 90. 15. 16. Next to New Orleans, this is the principal port on the Mississippi; and among the western cities it is second only to Cincinnati in population and wealth. The Upper Mississippi, Ohio, Missouri, and their numerous tributaries, furnish it with upwards of 8000 miles of connected water communication, and open up to it countries rich beyond description in mineral, vegetable, and animal products. The mineral resources of its immediate vicinity are very great, comprising iron, coal, lead, and probably copper. The town extends for nearly 7 miles along the curve of the Mississippi, and about 3 miles backward; but the dense portion of it is only about 2½ miles in length by 1½ in breadth. It stands on two plateaux of limestone formation, the one 20, the other 60 feet above the highest flood of the river. The ascent to the first plateau is rather abrupt; the second rises more gradually, and spreads out into an extensive plain, affording fine views of the city and river. The town is well and regularly laid out; the streets, with few exceptions, being wide, and intersecting each other at right angles. Front Street, Main Street, and Second Street run parallel to each other and to the river, and are the seat of the principal wholesale business. Fourth Street

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is the fashionable promenade, and contains the finest retail shops. The houses are well built and handsome, chiefly of brick, though limestone is sometimes used. The new court-house, a magnificent building, resembling in style the Capitol at Washington, is constructed of limestone, and occupies an entire square. The fronts are adorned with porticos, and in the interior is a rotunda lighted from the dome. Among the finest of the other buildings are,—the Roman Catholic cathedral, a number of the other churches, the market-house, arsenal, and several of the hotels and private residences. There are at present about 60 places of worship in St Louis, of which 12 are Roman Catholic, 12 Methodist, 8 Presbyterian, 5 Episcopalian, 2 Jewish synagogues.

The educational and literary institutions are numerous and efficient. The university of St Louis, organized in 1832, and under the direction of the Roman Catholics, is a well-ordered and flourishing institution, having, in 1855, 20 instructors, 175 students, and 15,400 volumes in library. The medical college connected with it is also in a very flourishing condition. The medical department of the Missouri college is also located here. The Mercantile Library Association, organized in 1846 and incorporated in 1851, has recently erected, at a cost of about L.20,000, a magnificent building, four storeys in height, having a library and reading-room, lecture-room, grand hall, &c. The benevolent institutions comprise several hospitals, asylums, &c. The city hospital, long distinguished for its excellent accommodation, has recently been found inadequate to the wants of a rapidly increasing population, and the erection of new buildings is in agitation. The marine hospital, sisters' hospital, the home for the friendless, designed for aged indigent females, and the house of refuge, are all valuable institutions. Of the Roman Catholic and Protestant orphan asylums, the former is under the direction of Sisters of Charity, the latter of Protestant ladies.

The city is supplied with water from the river, raised by means of steam engines into a reservoir 250 feet square by 15 feet deep, and capable of containing 5,000,000 gallons, and thence distributed over the city by about 36 miles of pipes. It is in contemplation to construct another reservoir, 540 feet in length, 250 in breadth, and 25 in depth, and capable of containing 52,000,000 gallons. Gas-works have recently been erected here, and about 33 miles of street pipes are now laid down.

The manufactures of St Louis, although still in their infancy, are of great importance, and rapidly increasing. The flour-mills are here more extensive than in any other city in the west. The product of the various mills for 1852 amounted to 393,184 barrels, and their daily capacity is estimated at 3000 barrels. Sugar refining is actively carried on; Belcher's sugar refinery being one of the largest in the Union. The vast mineral resources of the district are being taken advantage of, and the iron manufactures of St Louis already exceed those of any other city on the Mississippi, if not in the west. Chemicals, oils, and tobacco are among the more important of its other manufactures. It is, however, as a commercial city that St Louis is most important. The shipping owned in the district at 30th June 1852 amounted, according to the custom-house returns, to an aggregate of 37,861 tons, enrolled and licensed, of which 32,646 were steamers. The aggregate number of arrivals of steamers during 1852 was 3184.

St Louis was founded in 1764, but up to 1820 it contained only 4598 inhabitants, and in 1830 only 6694. In 1840 it had reached 16,469, and in 1850, 77,854, of whom 75,204 were free and 2650 slaves; 23,774 were natives of Germany, 11,257 of Ireland, 2933 of England, and 2450 of other foreign countries. An official return of the population of St Louis in 1855 gives the number of inhabitants in the city proper as 97,642, of whom 94,686 were free.

The entire population of the city and suburbs is estimated at nearly 120,000.

LOUIS, *St.*, a small island belonging to France, on the W. coast of Africa, Senegambia, at the mouth of the Senegal River, N. Lat. 16. 5., W. Long. 16. 32. It is low and sandy, about 2 miles long by half a mile in breadth, and nearly 5 miles from the debouchment of the Senegal. Situate on the island is a town and seaport of the same name, where the governor resides; it can only be reached by vessels of light burthen. Pop. of island, 15,000, of whom 800 are whites.

LOUISIANA, one of the United States of North America, is bounded on the E. by the state of Mississippi, W. by that of Texas, N. by that of Arkansas, and on the S. by the Gulf of Mexico. It extends from W. Long. 88. 50. to 94. 20., and its extreme southern point is in N. Lat. 28. 56., whilst its northern limit is in N. Lat. 33. The average length is about 240 miles, and the mean breadth rather more than 200 miles; the area being 46,431 square miles. The surface of Louisiana is low, and generally level, with some hilly ranges of slight elevation in the western part. The southern part of this state, from Lake Borgne to Sabine River, and from the Gulf of Mexico to Baton Rouge and Red River, is an alluvial tract of country, extending about 240 miles in length, by from 70 to 140 in breadth. It is intersected by numerous rivers, bays, creeks, and lakes, which divide the country into a great number of islands. Three-fourths of the state are destitute of any elevation which deserves the name of a hill. The pine woods generally have a surface of a very particular character, rising into fine swells, with table surfaces on the summit, and valleys from 30 to 40 feet deep. They do not present the aspect of a connected range, and are scattered over the country like the waves of an agitated sea. A range of hills commences by gentle undulations in Opelousas, rises gradually, and diverges towards the river Sabine. In the vicinity of Natchitoches it preserves a distance intermediate between the Sabine and Red Rivers, and increases in elevation to the western part of the state. A second line of hills, not far from Alexandria, commences on the N. side of Red River, and separating between the waters of that river and Dugdemona, unites with another chain of elevations which bound the alluvial plains of the Washita as bluffs, gradually diverging from that river as they pass beyond the western limits of the state. There are likewise some considerable hills beyond the Mississippi, and in some other parts the country is high; but, generally speaking, Louisiana is one immense plain, divided into pine-woods, prairies, swamps, and hickory and oak lands. The pine-woods have almost invariably a poor soil. The greater proportion of the prairies is second-rate land, and some of them are even sterile. A few, however, in Opelousas and those of Attakapas, possess great fertility. They are in general more level than those of the upper country. A very considerable extent of them has a cold clayey soil, with a hard crust near the surface. In other places the soil is of inky blackness, and in the hot and dry season it cracks into fissures of some inches in width. A considerable belt of these prairies, near the gulf, is low, marshy, and in rainy weather inundated. The bottoms are generally rich. Those of the Mississippi and Red Rivers are particularly so, and the vegetation there is remarkable for its size and luxuriance. The cotton on fresh lands of the richest quality reaches the size of a considerable shrub. The basin of Red River possesses extraordinary fertility, and the lower courses of this stream are noted for the production of cotton. The soil is said to derive its fertility from a portion of salt which is intimately mixed with it, and from its peculiar friability; and the darkish red colour which it bears, is to be traced to the presence of the red oxide of iron. All the branches of Red River, and they

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are very numerous, partake of the character of the main stream. The richest tract, however, in the state is a narrow belt of land lying along the Mississippi on both sides, and extending from 150 miles above to 40 miles below New Orleans. It is from 1 to 2 miles in width, and lies below the level of the river when flooded, being defended by a dyke about 6 or 8 feet in height. West of the Mississippi there are some tracts of soil very fertile, and here the sugarcane thrives well. A considerable portion of Attakapas is of great fertility, as are smaller portions of Opelousas, which is, however, best adapted for a grazing country. The lands on the Washita River are black, like those on the Mississippi; and the alluvions on the lower courses of this stream furnish an admirable soil for cotton and other productions.

A very great proportion of the surface of this state is covered with prairies. The first that occur W. of the Mississippi are those which are included under the general name of Attakapas; a term implying "man-eater" in the language of the savages who formerly inhabited it, and who are said to have been cannibals. It is an immense plain of grass, stretching from the Atchafalaya on the N. to the gulf on the S., and is of great fertility. To the W. of this prairie occurs that of Opelousas, still larger than the former, and computed to contain nearly 8000 square miles. It is divided by various natural boundaries into a number of prairies, distinguished by separate names. The soil, though occasionally very fertile, is less so than that of Attakapas; but this deficiency is compensated by the greater salubrity of the climate, which is reckoned the healthiest in the state. There are here very considerable cotton plantations, and some of indigo. Some of the others are of great extent, and they all possess nearly the same characteristics. They are generally so level as to appear to the eye a perfect plain; but there occasionally occur swells and declivities, such as are sufficient to carry the water from them. The margin which borders on the gulf is commonly a wet marsh, covered with a luxuriant growth of tall reedy grass called cane-grass. In various parts of these prairies there are islands of timber lands. Wherever a bayou or stream crosses the prairie, it is marked with a fringe of timber; and here the soil is invariably rich, as well as at the points of the prairie; but towards the River Sabine it is less so.

Wheat and rye do not flourish here in general, but oats and barley succeed well; and maize grows luxuriantly on the alluvions and rich lands. The sweet potato (*Convolvulus batatas*) in the sandy soil attains the greatest perfection. They are of different varieties, and occasionally of a very large size, but all are extremely nutritive, and raised with ease in great abundance. The Irish potato is not so easily raised, and is only cultivated for eating during the early part of summer. The pumpkin and melon tribe flourish in this climate, and all the northern fruits come to perfection, with the exception of apples, which generally decay before ripening. Different kinds of figs grow in the greatest abundance, and the tree would appear to attain its largest size in this quarter. Along the whole shore of the gulf, and in some other places, the orange tree, sweet and bitter, flourishes, and the fruit is of the finest quality. The cultivated vine flourishes abundantly; and wild grapes, such as the summer, winter, fox, muscadine, and pine-wood grape, are abundant. There is an immense number of wild and cultivated flowering shrubs, which flourish in this region; and the abundance of mulberry trees holds out a prospect that the culture of silk will ere long form one of the branches of trade in this state. The timber trees on the bottoms are willow, cotton-wood, honey-eye locust, pawpaw, and buck-eye; on the rich uplands, elm, cucumber, ash, hickory, mulberry, black walnut, with abundance of grape vines; and on the second rate, or sandy uplands, white, pitch, and yellow pines, and various kinds of oak. As yet agriculture is only in its infancy, the principal ob-

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ject being not to produce a great variety of crops, but to obtain the greatest amount of the staple productions. Sugar and rice are the staples of the state in general S. of 30°, and cotton N. of that parallel; the latter, however, is extensively cultivated in every part of the state. Sugarcane is an abundant article of growth in Louisiana. It requires the richest soil, the mould of which should at least be a foot deep. There are three or four varieties or species, as the African, the Otaheitan, the West Indian, and the riband cane. The Otaheitan grows luxuriantly, and ripens considerably earlier than the West Indian; but it is said to contain only two-thirds of the saccharine matter of the other. The riband-cane is a new and beautiful species, which possesses the advantage of not requiring so long a season for ripening. Throughout the state the planters are turning their attention to the cultivation of the sugarcane; and in 1850 this state produced nine-tenths of the entire quantity raised in the Union. The rice is remarkably white, and yields abundantly. There is a great extent of land favourable for the production of the upland rice; and no limit can be assigned to the amount which might be raised. The cotton cultivated here is an annual plant, growing in the rich lands more than six feet in height, and the larger stalks of the size of a man's arm, throwing out a number of branches, on which form large and beautiful whitish-yellow blossoms. It is planted from March till the middle of May, in drill rows, six feet apart. The kinds of cotton cultivated are—Louisiana, green seed or Tennessee, and recently Mexican cotton. The green seed is not of so fine a quality, but it is less subject to the destructive malady called the rot. The Mexican is finer, and yields more abundantly. Sea Island cotton grows well upon grounds that have been exhausted by the continued cultivation of the other kinds. All the species exhaust the soil; but the seeds, which accumulate in prodigious quantities around the gins, furnish an admirable manure, which supplies the deficiency of nutriment. Indigo was formerly a prime object of attention amongst the planters, but the cultivation of it has been abandoned. The finest tobacco is raised, but it is not so profitable as sugar and cotton, although that which is cultivated in the vicinity of Natchitoches is said to equal the tobacco of Cuba. Louisiana in 1854 produced 346,635 hogsheads of sugar.

In 1699 a colony of Frenchmen was founded on the shores of Louisiana by M. D'Iberville. In 1712 the King of France granted to M. Crozart a charter, which included the whole of the territory of Louisiana; but after five years the charter was surrendered into the hands of the king. To the company founded in Paris by the notorious John Law was granted the great territory of Louisiana, as it had been surrendered by Crozart. By the failure of this company, Louisiana again reverted to the crown, by which it was held for some time; but in 1762 it was ceded to Spain, to prevent its falling into the hands of the English. In 1800 Bonaparte succeeded in inducing Spain to retransfer Louisiana to France; and in 1803 it was sold to the United States for 60,000,000 francs=12,500,000. In 1812 it was admitted as a member of the Union.

According to the present constitution, every white male person, twenty-one years of age and upwards, who shall have resided in the state twelve months, and in the parish for six months next preceding the election, has the right of voting. The legislature consists of a senate of 32 members, elected for four years, one half going out every second year; and a house of representatives of not less than 70, nor more than 100, elected for two years. The governor is elected for four years. The legislature meets annually, and the session lasts not more than 60 days.

The constitution provides that "free public schools shall be established throughout the state; the proceeds of lands granted for the purpose, and of lands escheated to the state,

Louisville shall be held as a permanent fund, on which six per cent. interest shall be paid by the state for the support of these schools." The number of schools in operation on an average eight months in the year, in 38 parishes, was 687; average attendance about 36,000, and number of teachers about 1000. According to the census of 1850, Louisiana had 306 churches, with accommodation for 109,615 persons. Of these, 125 were Methodist churches, accommodating 33,180; 77 Baptist, 16,660; 55 Roman Catholic, 37,780; 18 Presbyterian, 9150; 14 Episcopalian, 5210; 6 Union, 1350; 3 Christian, 1500; 3 Free, 675; 1 German Reformed, 500; 1 Jewish, 600; 1 Universalist, 1000; and 2 minor sects, 1650. The number of libraries was 10, with 26,800 vols.; and of these, 5, with 9800 vols., were public; 2, with 12,000 vols., school; and 3, with 5000 vols., college libraries. In 1810 Louisiana contained 76,556 inhabitants; in 1820, 153,407; in 1830, 215,739; in 1840, 352,411; and in 1850, 517,763;—of whom 141,244 were male, and 114,248 female whites; 7479 free coloured males, and 9983 free coloured females; and 125,874 male, and 118,935 female slaves.

LOUISVILLE, a city and river port of the United States of North America, capital of Jefferson county, Kentucky, on the left bank of the Ohio, opposite the falls. N. Lat. 38. 3., W. Long. 85. 30. This town, the most populous in the state, and one of the chief ports on the Ohio, is regularly laid out on a plain about 70 feet above the river. Several of the streets are two miles in length, running parallel with each other, and often ornamented with rows of trees. The chief public buildings are the town-hall, the court-house, the two colleges for law and medicine, St Paul's Episcopal church, and the blind asylum. Besides these there is an historical institute, and a mercantile library association possessing 5000 volumes. Louisville owes its present importance to the falls which occur here, and to the canal constructed to obviate this stoppage of the navigation. It is 2½ miles long, cut through limestone, and falls 22 feet by means of lockage. The depth, however, which is only 16 feet, has been found insufficient for the heavy river steamers; and consequently a ship-railway has been projected, by which the largest vessels may be brought round the falls on the Indiana side of the river. Vast quantities of provisions are brought into Louisville both by river and railway, but especially by the former. In 1855 the value of articles (including provisions and hard goods) imported into the town amounted to L.7,566,945; the chief articles being pork and bacon, beef, sugar, flour, feathers, hemp, bagging, and shingles. Most of these likewise form articles of export. The steamship building has much increased here, and now constitutes an important trade. In the year ending November 1855 there were 41 steamers launched from this port. In the year ending 31st December 1855, 93 steamers, of 28,705 aggregate tonnage, were registered. The manufactures of the place have also increased in number and extent. Bagging, flour, rope, wool, cotton, and tobacco manufacturing now employ a large number of the inhabitants, and copiously supply the export trade. Louisville was laid out in 1773, but it was not established as a town till 1780, when it received its name from the Virginian legislature, in commemoration of the alliance concluded between Louis XVI. of France and the Western Republic. Pop. (1840) 21,210, (1850) 43,196, and (1853) 51,726.

LOURDES, a town of South France, department of Hautes Pyrénées, on the right bank of the Gave-de-Pau, 24 miles S.E. of Pau. It is built on a steep elevation, which rises to the height of 511 feet, and is crowned by a fortress formerly possessed by the counts of Bigorre. The streets are as well laid out as the irregular nature of the ground will admit. Manufactures of handkerchiefs and flax are carried on, as well as a general trade in agricultural pro-

duce. Some remains of Roman fortifications are found here, and in the vicinity are several curious grottos. While in the possession of the English in the fourteenth century, it formed the centre point of their military operations, but was evacuated by them shortly after the treaty of Breigny in 1360. Pop. (1851) 4500.

LOUTH, a maritime county in the province of Leinster, in Ireland, bounded on the N. by the county of Down and the Bay of Carlingford, on the E. by the Irish Sea, on the S. by the county of Meath, and on the W. by the counties of Meath and Monaghan. It is the smallest county of Ireland, comprising an area of only 315 square miles, or 201,434 acres; of which 178,972 are arable, 15,603 uncultivated, 5318 in plantations, 728 in towns, and 813 covered by water. Of the 15,000 acres of uncultivated or coarse pasture land of unproductive nature, it is estimated that 3000 may be drained and tilled; 5000 may be drained for pasture; and 7000 acres of the elevated ground near the summit of the mountains must be considered incapable of improvement.

In the time of Ptolemy it formed part of the maritime district inhabited by the Voluntii. Afterwards it was known by the name of Argiall, Orgiall, or Uriell, which also comprehended the greater part of the counties of Meath, Monaghan, and Armagh. Its leading families of Irish extraction were the O'Carrolls and the M'Scanlans. It was conquered by the English under De Courcy in his progress northwards to Ulster, and formed one of the twelve counties into which King John divided that part of Ireland which acknowledged his authority, and was granted to De Courcy, and subsequently to De Lacy, as earls of Ulster. By De Lacy it was divided and subgranted among the families of De Verdon, Peppard, Taate, Bellew, Gernon, &c. It is now divided into the six baronies—Ardee, Drogheda, Upper and Lower Dundalk, Ferrard, and Louth, which are subdivided into sixty-one parishes, all in the archdiocese of Armagh, and two parts of parishes in the diocese of Clogher.

The southern part of the county is fertile and agreeably diversified by gentle undulations of surface. Proceeding northwards, it becomes more hilly, until, at its most northern extremity, it rises into the bold and picturesque mountains of Ravensdale and Carlingford, which in some places attain an elevation of nearly 2000 feet. The rivers are the Dee, the Clyde, the Fane, and the Castletown. None of them are navigable, being useful solely for irrigation and other purposes of rural economy. The Boyne, which forms part of the southern boundary of the county, is navigable for large vessels as far as Drogheda. The county has a considerable line of sea-coast, consisting chiefly of a sandy strand, except where it is broken by the projection of Clogher Head, a bold promontory, which, although only 180 feet in height, forms a striking feature from the adjoining flat sandy beach. The Bay of Dundalk extends beyond this point for seven miles at its mouth, indenting the coast for an equal distance inland. The Carlingford Mountains, bounding the northern extremity of the county, separate it from the bay of that name, which forms the line of demarcation both between the counties of Louth and Down and the provinces of Leinster and Ulster. This bay is deep and narrow, extending in length upwards of nine miles, with an average breadth of a mile and a half. It is navigable to Warrenpoint, near the town of Newry, and its shores on both sides are much admired for their bold and picturesque scenery. Immense beds of oysters, in high estimation amongst gastronomists for peculiar delicacy of flavour, occupy different localities in this bay.

The soil in the southern lowlands is well adapted for tillage, being composed of a rich vegetable mould resting on marl or on limestone, sometimes with a substratum of slate. The quality of the soil diminishes in agricultural value as

Louth.

Louth.

the land rises towards the N., and the summits of the mountainous district produce only heath and scanty herbage.

The mountains are composed chiefly of granite. On their borders hornblende and primitive greenstone are found in abundance, after which are exterior ranges of transition rock. The lower lands rest on a clay-slate formation. The line of separation between the granite and the clay-slate extends from Carlingford Bay, over the summit of the Ravensdale Mountains, into the county of Armagh. Flœtz limestone appears in the neighbourhood of Drogheda and Ardee. A lead mine was worked for a short period at Salterstown, near the sea-coast.

The returns of the population, taken at different periods, present the following results:—

1760.....	De Burgho.....	67,512
1792.....	Beaufort.....	57,750
1821.....	Parliamentary return.....	101,011
1831.....	Ditto.....	107,481
1841.....	Ditto.....	111,979
1851.....	Ditto.....	90,812

The county, though the smallest in Ireland, sent no fewer than twelve representatives to the Irish parliament. Two were returned for the county, two for the town of Drogheda, and two for each of the boroughs of Dundalk, Ardee, Carlingford, and Dunleer. The Act of Union reduced this number to four,—two for the county, one for Drogheda, and one for Dundalk; and this arrangement still continues.

The number of schools and of pupils attending them during the week ended 12th April 1851, was,—

Schools.	No. of Schools.	No. of Pupils.		
		Males.	Females.	Total.
National	48	2069	1940	4009
Church Education	14	258	209	467
Endowed	6	311	161	472
Boarding	3	11	95	106
Private	32	433	286	719
Parochial ..	8	108	118	226
Free.....	7	127	140	267
Industrial	1	...	7	7
Mission	1	2	3	5
Military	1	15	20	35
Workhouse	3	289	378	667
Gaol.....	1	62	26	88
	125	3685	3383	7068

The lands capable of cultivation are mostly kept in tillage. Potatoes, wheat, oats, and barley, raised according to the succession here stated, form the principal crops. In the northern districts oats are chiefly raised.

The total extent of land under each description of crop in 1855 and 1856 was:—

	1855. Acres.	1856. Acres.
Wheat.....	9,674	14,951
Oats	38,530	34,228
Barley, bere, rye, beans, and pease,	22,028	20,195
Potatoes	12,010	14,639
Turnips.....	9,235	9,027
Other green crops.....	2,548	2,615
Flax.....	190	219
Meadow and clover.....	17,286	18,131
Total.....	111,501	114,005

Sheep are most abundant in the hilly districts.

The quantity of live stock in the county in 1855 and 1856 was:—

	1855.	1856.
Horses	12,133	12,328
Cattle.....	32,107	31,481
Sheep.....	31,712	40,440
Pigs.....	14,232	12,017

Many parts of the county are well planted. The ash tree grows in the lower grounds to a great size. The coasts

furnish a constant supply of fish; and the flat shores abound with sea-fowl, especially barnacle, which, however, is not so highly esteemed for flavour as that of Wexford or Derry. The manufacture of coarse linens is carried on to a considerable extent.

Few counties can boast of so many remains of antiquity. There are two round towers,—one at Monasterboice, 110 feet in height, and in a state of excellent preservation, the other at Dromiskin, much decayed. At the former of these places there are also the remains of two small churches and of three finely sculptured crosses, one of them 18 feet high. Near the banks of a stream called the River of Balrichan, is a large artificial cave, accidentally discovered by the sinking in of a horse whilst ploughing. It consists of several narrow passages, the sides and top of which are formed of flag-stones. Some bones of large and small animals were found in it. About 2 miles from Dundalk are the ruins of a very ancient structure, which has some resemblance to the hull of an ancient galley. There are no traces of doors, windows, or loop-holes. The building has given rise to much antiquarian discussion. At Ballymascanlan is a cromlech called the Giant's Load, consisting of a rock 12 feet long and 6 broad, elevated on three upright stones. Near it is Castle Rath, surrounded by moats and lesser raths, and with a remarkable tumulus in its vicinity. The great mound of Castleguard, near Ardee, is 90 feet in height and 600 feet in circumference at its base. Its summit terminates in an area 140 feet round. It is well planted, and surrounded by a deep trench. At Faughart are the remains of an ancient intrenchment. The decisive battle which terminated in the defeat and death of Edward Bruce, by Sir John Bermingham, afterwards Earl of Louth, was fought near this place. The remains of castles are numerous. That of Carlingford, built by King John, occupies a commanding position on a rock projecting into the bay. Castletown stands within sight of the town of Dundalk. Terfeckan Castle, once the residence of the learned Archbishop Usher, is now in ruins. The county is equally remarkable for the number of its ancient monastic edifices. Mellifont, a Cistercian abbey, 5 miles W. of Drogheda, presents some remains equally remarkable for their beauty and singularity of architecture. Others are to be traced at Carlingford, Faughart, and Monasterboice. The principal towns of the county are Dundalk, Ardee, and Drogheda.

(11.5-11.)

LOUTH, a municipal borough of England, Lincolnshire, and a station on the Great Northern Railway, is situate on the River Ludd, 25 miles E.N.E. from Lincoln. The houses are mostly built of brick and roofed with slate, and the streets are clean, well paved, and lighted with gas. Louth has a guild-hall, a sessions-house, a house of correction, an assembly-room, several churches and chapels, almshouses, a dispensary, and a small theatre. The principal building is the church of St James, an edifice of the later English style, surmounted by an octagonal spire of 288 feet, and possessing an east window remarkable for its beautiful tracery. There is a richly endowed grammar school, founded by Edward VI., from whom the borough also received its charter. Louth is famous for its ale; and has manufactories of carpets, blankets, soap, and paper. By means of a canal, fed by the Ludd, and communicating with the Humber, it carries on a considerable traffic in corn and coals. Since the Reform Act, the borough has been divided into two wards, and governed by a mayor, six aldermen, and eighteen councillors. Markets are held on Wednesday and Saturday. In the vicinity are the ruins of a Cistercian abbey, founded in 1139 by Alexander, Bishop of Lincoln. Pop. (1851) 10,467.

LOUVAIN, an ancient town of Belgium, province of South Brabant, on the River Dyle, a tributary of the Scheldt, 15 miles E. by N. of Brussels. It consists of re-

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Louviers. gular but ill-built streets, and is encompassed by an earthen rampart 90 feet high, which in some parts has been converted into boulevards. On the outside is a dry ditch of considerable depth; while here and there ruined bastions, said to have been erected by the Spaniards, stand at intervals on the wall. The town, though once a place of commercial importance, has been for many years decaying, and now presents a deserted appearance. It has, however, many public buildings of considerable interest. The town-hall, founded in 1448, and recently repaired, is a building of great beauty, embellished as it is with the finest chisellings, and ornamented with many sculptures. In its neighbourhood stands the cathedral, founded in 1040; and, in consequence of two destructive fires, re-erected in 1358. The sacristy of this church exhibits elaborate carving, and rises in a hexagonal form to the height of 30 feet. The wooden pulpit is likewise a fine specimen of carving, representing the conversion of St Paul. Many famous paintings of the old Flemish school also ornament the building. The other most notable edifices are,—the guild-hall, founded in 1317, the university, the picture-gallery, and the church of St Gertrude. The university was a distinguished school of Roman Catholic theology in the sixteenth century, and possessed large endowments. It was, however, suppressed by the French republic; but at the end of the French war it was re-opened by William of Holland. Its library contains 105,000 volumes. The only manufacture of importance carried on here is that of beer, which is accounted the best in Belgium, and of which there are about 200,000 casks brewed yearly. Some woollens, hosiery, hats, soap, and candles, are also manufactured here.

Louvain is a place of considerable antiquity, and by some is thought to have been founded by Julius Cæsar. The ruin of the old castle situate at the outskirts of the town is known by the inhabitants under the name of the Château de César, although it was not erected till 900 years after the death of Julius Cæsar. It was the residence at different times of Edward III. of England and Charles V. of Spain. In the fourteenth century Louvain was the chief town of Brabant, was very populous, and the principal seat of the woollen manufacture in Flanders. In 1382 a large number of the weavers were banished from the town in consequence of a disturbance. These mostly emigrated to England, where they recommenced the wool manufacture, which, under their care, soon became more important than it had ever been at Louvain. From this period the town gradually decayed. It was taken for the first time in 1792 by General Kleber, who commanded the forces of the French republic. Pop. (1850) 30,065.

LOUVIERS, one of the three principal cloth-manufacturing towns of France, and the capital of the arrondissement of the same name in the department of Eure, is advantageously situate on the River Eure, 17 miles S.S.E. of Rouen. It has 30 manufactories for cloth, and 19 spinning mills of woollen yarn, which employ about 12,000 persons in and around the town. The cloth manufactured at Louviers is remarkable for its fine quality; yet the town is being gradually outstripped by Elbeuf. Louviers is an old town, of which the newer part, on the right bank of the Eure, is well built; but the older part on the left is "constructed of wood, and traversed by narrow dirty lanes, where the working classes are huddled together in ignorance, demoralization, and wretchedness." The principal building in the town is the church of Notre Dame, erected in 1496. The chief factories are for the most part well built, and the machinery of admirable construction and arrangement. Its manufacture of fine cloths dates as far back as 1680; but in 1789 it produced only from 3000 to 4000 pieces annually, while at the present day it sends forth as much as from 30,000 to 40,000 pieces. There are also dyeworks, bleachfields, tannerics, and sugar refineries

in the town. Louviers suffered severely from the early wars between France and England. Taken by Henry V. of England in 1418, and retaken by the French in 1450, it sustained a protracted siege during the following year from the Duke of Bedford, who, after taking it, razed it to the ground. It was rebuilt ten years afterwards. Louviers has a civil and commercial tribunal, and a council of *prud'hommes*, and (in 1851) a pop. of 10,380.

LOVELACE, RICHARD, a poet, the son of Sir William Lovelace, of Lovelace Place, in Kent, was born in 1618. After receiving his education first at Charter House, and afterwards at Gloucester Hall, Oxford, he was presented at court, and was there much admired for his amiable disposition and handsome person. A zealous royalist, he became a colonel in the army of Charles I., and soon after the close of the civil war was the bearer of a petition from the county of Kent to the Long Parliament for the restitution of the king and the settlement of the government. For this bold deed he was imprisoned, but was soon liberated on a heavy bail. Having entered the French service in 1646 as commander of a regiment which he had raised, he was wounded at the battle of Dunkirk. On his return to England in 1648, he was again thrown into prison, and continued there till the king's death in 1649. In the same year was published his volume of Odes, Sonnets, and Songs, under the title of *Lucasta*, the fictitious name of a lady who had reciprocated his attachment, but in consequence of a false report of his death at Dunkirk, had been married to another. Thrown into a state of melancholy by this latter circumstance, and penniless through his vast expenditure in the royalist cause, he passed his latter years in wretchedness. Wood relates that he died of consumption in 1658 in a miserable alley near Shoe Lane. Lovelace also wrote *The Scholar*, a comedy, and *The Soldier*, a tragedy. In 1659 appeared his *Posthume Poems*; and these, along with his *Lucasta*, were reprinted in 1817 and 1818, 12mo. A few of his lyrics, including his well-known lines, *To Althea from Prison*, are free from the crude conceits and disjointed versification of the majority of his poems. Pervaded by the quaint and deformed imagery peculiar to that age, they are yet raised to the rank of true lyrical poetry by their sweetness of rhythm, simplicity of thought, and tender and elevated feeling.

LOWELL, an important manufacturing town of the United States of North America, one of the capitals of Middlesex county, Massachusetts, on the right bank of the Merrimack River, at its junction with the Concord, 25 miles N.N.W. of Boston. Although the site of the town has considerable inequality of surface, its streets are regularly laid out, and intersect each other at right angles. The private residences are spacious, and many of them elegant buildings. Amongst the public edifices, the chief are,—the court-house, the mechanics' hall, a sick hospital for operatives, and a market-house. The literary institutions of the town are very efficient, and have been of considerable service to the community. The mechanic association, incorporated in 1825, has a valuable library of about 6000 volumes, and a scientific apparatus; while the city school library contains 9500 volumes, and is open to all on a small yearly payment. The great advantage which Lowell enjoys for a manufacturing town is derived from a descent of 30 feet made by the Merrimack, and known as the Pawtucket Falls, which, by means of canals and locks, provides abundance of water-power. Besides these there is a capacious reservoir, placed on an elevation eastward of the city, which furnishes an immense supply of water at all times in case of fire. The principal goods manufactured here are cotton, wool, and iron. The first is made into cotton cloth and calico; the second into carpets, cloth, and coarse stuffs; and iron into machinery and wire fences. Besides these, however, bleaching is carried on

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extensively, as well as the preparation of dyes, glue, and other essentials of the cotton and wool manufactures. In January 1855 there were 12 manufacturing companies in Lowell, owning 52 mills, and working 371,838 spindles, and 11,407 looms. The aggregate quantities produced every week were 2,230,000 yards of cotton cloth, 30,000 yards of woollen cloth, 25,000 yards of carpeting, and 50 rugs. In the same year, £2,900,000 of capital was invested in the whole manufactures of the place; while the number of hands employed amounted to 8723 females, and 4542 males. Every attention is paid by the mill-owners to the health and morality of their operatives. One of the best proofs of the general good conduct of the mill-workers here is shown in the large amounts deposited by them in the savings-bank; and also in the interest they take in the literary and scientific associations connected with the factories. About a third of the inhabitants are of Irish extraction. The site of Lowell was first inspected in 1821 by several gentlemen, for the purpose of erecting a calico printing mill in New England. The building was immediately commenced, and in 1823 its machinery was set in motion. In 1826 it was established as a town, and named after Francis Lowell, an enterprising manufacturer of Boston. In 1836 it was raised to the rank of a city. Pop. (1840) 20,796, (1850) 33,335, (1854) about 38,000.

LOWER, RICHARD, an eminent English physician in the seventeenth century, was born in Cornwall, and educated at Westminster School and Oxford. He afterwards studied medicine, and practised under Dr Thomas Willis, whom he instructed in some parts of anatomy, especially when the latter was writing his *Cerebri Anatome*. In 1674, Lower, along with Dr Willis, discovered the medicinal waters at Ashop, in Northamptonshire, which, upon their recommendation, became very much frequented. In 1666 he followed Dr Willis to London, practised physic under him, and became a fellow of the Royal Society and also of the College of Physicians. In 1669 he published his *Tractatus de Corde*; and after the death of Dr Willis in 1675, he was esteemed the most eminent physician in London. Lower died in 1691.

LOWESTOFT, a market-town on the E. coast of Suffolk, 114 miles N.E. from London by road, and 149 by railway. The town, which is a place of great antiquity, stands on the top of a cliff facing the sea, from which it presents a remarkably picturesque appearance. It consists of a principal street, nearly a mile in length, with several smaller ones leading off from it. The parish church, about half a mile west of the town, is large and handsome, and contains several interesting monuments of antiquity. Potter, the distinguished Greek scholar, is buried in the churchyard. There is also a chapel of ease in the place, and chapels for Wesleyans, Independents, and Baptists. There is a free school and a national school in the town; besides a town-hall, a theatre, a lunatic asylum, and two lighthouses—one on the upper cliff, and another on the beach at the south end of the town. The roadsteads are sheltered by the Corton and Newcome Sands. Lowestoft has recently risen into considerable repute as a bathing place, from the peculiar adaptation of its sands for that purpose. Sir Samuel M. Peto purchased the harbour in 1844, and originated measures for the deepening of Lake Lothing, and for the general improvement of the port and town. The same gentleman further laid the town under considerable obligations to him by the construction of a branch railway from Reedham to Lowestoft. The principal manufactures are those of rope and twine; and a great number of the inhabitants are engaged in the fisheries and in fish-curing for the markets of London and Norwich. The shipping returns, given on the 31st December 1855, show the number and tonnage of the sailing vessels registered at Lowestoft as follows:—101 sailing vessels, with a

tonnage of 4353; and 7 steam-vessels, with a tonnage of 1297. Lowestoft communicates with Denmark by steam during the season. Pop. (1851) 6580.

LOWICZ, a walled town of Poland, about 45 miles W.S.W. of Warsaw, on the Bzura, one of the feeders of the Vistula. It has an old castle, cavalry barracks, three churches, several monasteries, a Piarist college and gymnasium, a normal school, and an hospital. There are some manufactories of refined wax in the place; and it carries on a considerable trade in horses and cattle. The principal branches of industry, however, are linen-weaving and tanning. It was formerly the capital of a principality. Pop. 7100.

LOWTH, DR ROBERT, Bishop of London, the son of Dr William Lowth, was born at Buriton, in Hampshire, on 28th November 1710. From Winchester school he passed, in 1730, to New College, Oxford; and in 1737 became master of arts. He remained at the university, devoting himself to the cultivation of his fine talents, long concealed by the veil of his native modesty, but now slowly becoming visible to the world. Elected professor of poetry in 1741, he was re-elected in 1743, and in this capacity he delivered his lectures *De Sacra Poesi Hebræorum*. Bishop Hoadley collated him in 1744 to the rectory of Ovington, in Hampshire; and nine years afterwards to the rectory of East Woodhay, in the same county. He had also appointed him, in 1750, Archdeacon of Winchester. In 1754 Lowth received the diploma of D.D. from the University of Oxford. He had travelled in 1749 with Lord George and Lord Frederick Cavendish, and had thus been introduced to their kinsman, the Duke of Devonshire. Accordingly, when this nobleman repaired to Ireland, in 1755, as lord-lieutenant, Lowth accompanied him as his first chaplain. Immediately after this he was presented to the see of Limerick, an appointment which he exchanged with Dr Leslie for the prebend of Durham and rectory of Sedgfield. In 1765 he was elected a fellow of the Royal Society; and in the subsequent year was appointed successively to the see of St David's and to that of Oxford. He became Bishop of London in 1777; and in 1783 declined the primacy offered to him by George III. After enduring with great patience and fortitude a severe and protracted attack of the stone, he died at Fulham on 3d November 1787.

Bishop Lowth's first great publication was his *Prælectiones de Sacra Poesi Hebræorum*, Oxford, 1753, 4to; 1763, 8vo; republished, with valuable notes by J. D. Michaëlis, 1770, 8vo, and translated into English by Dr Gregory, 1787. These prælections, discussing a fresh and interesting subject, and written in remarkably pure Latin, were favourably received by the learned, both at home and abroad. His *Life of William of Wykeham*, published in 1758, shows with what skill and patience he could arrange a chaos of facts gathered from "records, registers, manuscripts, and other sources." In 1778 appeared his greatest work, *A Translation of Isaiah*, accompanied by a dissertation, and notes critical, philological, and explanatory. It is marked by the most critical knowledge of the character, and a full appreciation of the spirit, of eastern poetry. The 13th edition of this work appeared in London in 1842. Lowth also engaged with Warburton in a war of pamphlets, touching the book of Job, and for bitterness of spirit did not fall one whit behind that merciless controversialist. An *English Grammar* which he published in 1762, was in great repute in his own time, but has long since fallen into neglect. A similar popularity in the case of his poetical pieces was followed by a similar fate. Several of his sermons were published at different times, and have recently been reprinted, along with other remains, by P. Hall, London.—In the high offices which he latterly held, Bishop Lowth consulted the best interests of the church by endeavouring to supply her vacant preferments with the most meritorious in the profession.

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LOWTH, *Dr William*, a learned divine, the son of an apothecary, was born in London in 1661. He received his rudimentary education at a school in his native city; and having entered St John's College, Oxford, in 1675, became master of arts in 1683, and bachelor in divinity in 1688. Seeing his great worth and learning, Dr Mew, Bishop of Winchester, made him his chaplain, and conferred upon him, in 1696, a prebend in his own cathedral; and in 1699 the rectory of Buriton, in Hampshire. Lowth now devoted his whole time to the duties of his profession. In his thorough study of theology, he ranged over the entire field of Latin and Greek literature, both ecclesiastical and profane, collecting many valuable notes, critical and philological. Some of these he afterwards contributed to Potter's edition of *Clemens Alexandrinus*, to Hudson's *Josephus*, to Reading's *Ecclesiastical Historians*, and to the *Bibliotheca Biblia*. His advice, also, was largely used by Chandler, Bishop of Durham, while he was engaged in writing his *Defence of Christianity*, and his *Vindication of the Defence*. More admirable, however, than even his great erudition, was Lowth's private character. His piety, ever active and benevolent, was the living embodiment of the earnest instruction he delivered from the pulpit. He died in 1732. One of his sons was Dr Robert Lowth, the subject of the preceding article. Dr Lowth's principal works are:—*A Vindication of the Divine Authority and Inspiration of the Old and New Testaments*, Oxford, 1692, 12mo, London, 1699; *Directions for the Profitable Reading of the Holy Scriptures*, London, 12mo, 1708, 1726; and *Commentaries on the Prophets*, 1765.

LOXA, a town of Spain. See **LOJA**.

LOXA, or *Loja*, a town of South America, in the republic of Ecuador, and department of Assuay, capital of the province of the same name, is situate in a valley of the Andes Mountains, 6768 feet above the level of the sea, in S. Lat. 4., and W. Long. 79. 24. It has an extensive trade in cinchona bark, obtained in the mountain forests to the E. of the town, and is considered to be of the finest quality. Pop. 10,000.

LOYOLA, **IGNATIUS**. See **JESUITISM**.

LOZÈRE, a department of France, formed from Gévaudan, a part of the old province of Languedoc, is bounded on the N. by the departments of Cantal and Haute-Loire, E. by those of Ardèche and Gard, S. by that of Gard, and on the W. by that of Aveyron. It is situate between N. Lat. 44. 7. and 44. 56., and E. Long. 3. and 4.; and is 65 miles long and 44 broad, with an area of 1995 square miles. This department takes its name from one of the summits of the Cévennes, which traverse it in the N. and E. The Margeride and Aubrac summits in the N. and W. belong also to this extensive range of mountains, which, with their traces of extinct volcanoes, precipitous cliffs, beautiful cascades, and stalactite caverns, present some of the most picturesque and delightful scenery. These mountains slope toward the Rhone, the Loire, and the Garonne, and form part of the basins of those rivers. The principal feeders of the Rhone are the Cèze (in which gold has been found), the Gard with its tributaries, and the Chassezac, which joins the Ardèche before reaching the Rhone; of the Loire, the Allier, with its tributaries the Chaperoux and the Ance; of the Garonne, the Lot, with its tributary the Truyère, and the Tarn, with its tributaries the Tarnon and the Jonte. None of these rivers are navigable in this department. The chief minerals are iron, copper, and lead, found mainly in Bagnols and Chaldette. Industrial manufactures are almost entirely confined to woollen and silken stuffs. The department is agricultural, but is one of the poorest and most thinly peopled of all France. The soil of the Montagne district in the N. is chiefly of a basaltic and granitic nature, and produces only hay and rye;

that of the Causses district, in the centre, is calcareous, and is the most fertile in the department, yielding wheat, barley, oats, hay, and fruits; that of the Cévennes district, in the S. and S.E., is of a schistose nature, and grows chestnuts, potatoes, and mulberries. The wine is scarce and of a bad quality. Some attention is given to the rearing of the silk-worm and of sheep. The climate is generally severe, and the temperature variable; the winters are long and cold, and a great quantity of rain falls throughout the year. The towns are small and badly built, and the roads are but few and generally in a wretched condition. There are 5 Calvinistic churches in the department, 8 churches belonging to the national religion, and 17 schools. There are 3 tribunals of first instance, having the court of appeal at Nîmes, 1 college, 1 normal school, 1 superior communal school, 591 elementary schools, of which 216 are communal. Lozère belongs to the tenth military division of France, that of Montpellier. Its chief town is Mende, with a pop. of 6944.

There are three arrondissements in this department, subdivided as follows:—

	Cantons.	Communes.	Pop. in 1851.
Mende.....	7	63	49,361
Marvejols.....	10	78	53,918
Florac.....	7	52	41,426
	24	193	144,705

LÜBECK, one of the free cities of Northern Germany, and the capital of a small territory, is situate on a gentle ridge between the rivers Trave and Wakenitz, 10 miles from the mouth of the former at Travemünde, and 86 miles N.E. of Hamburg. Lübeck is the capital of the four free or Hanseatic towns, and the seat of their supreme court of appeal. The court consists of six members, one of whom is chosen by each of the free towns; Frankfort and Bremen nominate the fifth; while the sixth is named alternately once by Lübeck and twice by Hamburg. The president is chosen annually by the senates of the four towns.

The present city of Lübeck was founded in 1143 by Adolphus II., Count of Holstein and Schaumburg, by whom it was ceded in 1158 to Henry Duke of Saxony, surnamed the Lion. In 1226 it was made a free imperial city by Frederic II. At this time it was an important commercial city, and was rapidly increasing. In 1241 it entered into treaty with Hamburg, and thus laid the foundation of the Hanseatic League, of which it became the head about 1260. For four centuries Lübeck continued in a flourishing condition, and is said to have at one time contained 200,000 persons. After the dissolution of the league, which took place in 1632, it gradually fell into decay, and has never again attained its former importance. After the battle of Jena in 1806, the Prussian general, Blücher, with the remains of his army, took refuge in Lübeck, which was then stormed by the French, and sacked and pillaged for three days. In 1810 it was annexed to the French empire, and so remained till after the battle of Leipzig in 1813, when it was restored to its political independence, and subsequently joined the German Confederation as a free city. It has one vote in the full council; but in the select council it has only one in conjunction with the other free towns. Lübeck is one of the most picturesque old towns in Germany. Its streets are generally straight and regular, and its public buildings, which are mostly of brick, have undergone little change since the fifteenth century. Many of the houses are in the old-fashioned style, with their quaint gables towards the street; and not a few of them are remarkable for the richness of their architecture. The old ramparts of the town have been laid out in public walks. The finest building in Lübeck is the Marienkirche, founded in 1304. It is in the pointed Gothic style, constructed almost entirely of brick, and surmounted by two towers with spires rising to the height of 430 feet. It has three naves; the roof of the centre one rising to the unusual height of 134 feet. It contains

Lübeck.

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numerous monuments and paintings,—the latter by Holbein, Vandyck, Overbeck, &c. The "Dance of Death," dated 1463, is remarkable as representing the costumes of the period. This church possesses a very fine organ, and has also a curious old astronomical clock, constructed in 1405. The Domkirche, or cathedral, built between 1170 and 1341, is almost entirely of brick, and has two towers surmounted by spires 300 feet high. It contains numerous monuments to bishops and others connected with Lübeck. The screen of the choir is a masterpiece of wood-carving of the early German school. In one of the side chapels is a painting by Memling representing the Passion of our Saviour in twenty-three distinct groups. The town-house, on the market-place, is a curious old Gothic brick building, completed in 1517. Here in ancient times deputies from the 85 cities in Germany composing the Hanseatic League, held their sittings. The educational and charitable institutions are numerous; besides which there are an exchange, mint, arsenal, public library with 37,000 volumes, and a theatre.

Lübeck is still a place of considerable commercial importance. It trades largely with Hamburg by means of the Trave and a canal, and also with Russia, Denmark, Sweden, and Finland. A branch line connects it with the Hamburg and Berlin Railway. Regular steam communication is kept up with Copenhagen, Stockholm, and St Petersburg. Vessels drawing not more than 9 feet of water can come up to the town, but larger vessels load and unload by means of lighters at Travemünde, between which and Lübeck small steamers are constantly plying. The chief exports are,—corn, cattle, wool, iron, and timber; imports,—wines, silks, cottons, hardware, colonial products, and dye-stuffs. In 1855, 972 vessels, carrying 55,266 lasts, entered; and 958 vessels, carrying 54,246 lasts, left the port.

The manufactures are numerous, but not large or important. Among the chief are woollen, linen, cotton, and silk goods; tobacco, soap, paper, playing-cards, musical instruments, hats; and iron, copper, and brass wares.

The territory subject to Lübeck consists of a district of about 80 square miles immediately adjacent to the city, of several small detached portions surrounded by Holstein; and of a portion of the Vierlande district; amounting in all to 127 square miles. The total population in 1851 amounted to 54,166 persons, of whom 26,096 were in the town.

LUBIENIETSKI, STANISLAUS, one of the chiefs of the Socinians in Poland, was born at Cracow in 1623. Becoming minister of a church at Lublin, he advocated the opinions of his sect so boldly that he provoked the enmity of the Jesuits, and was forced to flee to Hamburg. There, it is said, he was destroyed by poison in 1675. Lubienietski wrote *Historia Reformationis Polonicae*, Freistadt, 1685. His chief work is his *Theatrum Cometicum*, Amsterdam, 1667; in which, after giving a minute account of all the comets previous to 1665, he endeavours to prove from their history, that if they portend anything whatever, they foretell both evil and good, and not evil alone, as the common opinion runs.

LUBLIN, a city of Poland, the capital of the province of Lublin, is situate on the left bank of the Bistritz, 95 miles S.E. from Warsaw. Formerly fortified, the town is still surrounded by walls and ditches. It consists of houses built for the most part of wood and irregularly grouped, and is divided into two parts, the upper and the lower. The chief buildings are an old citadel, the cathedral of St Michael, the Sobieski Palace, a Piarist college, and several churches. There are also monasteries, a synagogue, and several educational and charitable institutions. Lublin is one of the chief seats in Poland of the coarse woollen and cotton manufacture; and trades in corn, cloth, and Hungarian wine. It is the see of a bishop, and has a court of appeal. Its three great annual fairs, each lasting a month, are frequented by Turks and Armenians. Pop. about 15,000.

LUBNŪ, an old town of Russia, in the government of

Luc.

Poltava, the capital of a circle of the same name, is situate on the Sula, about 80 miles W.N.W. from Poltava. Besides some churches and a veterinary institution, it has a small botanic garden. Lubnū was formerly so strongly fortified as to withstand a long siege from Charles XII. of Sweden. Pop. about 6000.

LUC, JOHN ANDRÉ DE, a natural philosopher of great merit and celebrity, born at Geneva on the 8th of February 1727, was the son of James Francis de Luc, descended from a family which had emigrated from Lucca and settled at Geneva in the fifteenth century.

His father was the author of some very respectable publications in refutation of Mandeville and other sceptical writers; and he had the means of giving his son an excellent education, although he found it convenient to establish him in a commercial engagement, which principally occupied the first forty-six years of his life, without any other interruption than that which was occasioned by some journeys of business into the neighbouring countries, and a few scientific excursions among the Alps. During these, however, he collected by degrees, in conjunction with his brother William Antony, a splendid museum of mineralogy and of natural history in general; which was afterwards increased by his nephew, André De Luc. He at the same time took his share of the public business of the state, as one of the Council of Two Hundred; and he is still remembered with respect by his fellow-citizens, though he revisited them but once, and that for a few days only, after his emigration, which was the consequence of some unexpected misfortunes in commerce. These he bore with fortitude, and rather rejoiced than lamented at the change in his pursuits, when he removed to England in 1773. He was made a fellow of the Royal Society in the same year, and was appointed reader to the queen; a situation which he continued to hold for forty-four years, and which afforded him both leisure and a competent income. In the latter part of his life he obtained leave to perform several tours in Switzerland, France, Holland, and Germany. In this last-mentioned country he passed six years, from 1798 to 1804; and after his return he undertook a geological tour through England. When he was at Göttingen, in the beginning of his German tour, he received the compliment of being appointed honorary professor of geology in that university; but he never entered upon the active duties of a professorship. He was also a correspondent of the Academy of Sciences at Paris, and a member of several other scientific associations.

His favourite studies were geology and meteorology. The situation of his native country had naturally led him to contemplate the peculiarities of the earth's structure, and the properties of the atmosphere, as particularly displayed in mountainous countries, and as subservient to the measurement of heights. He inherited from his father a sincere veneration for the doctrines of Christianity, and a disposition to defend the Mosaic account of the creation against the prevailing incredulity of the age. His royal patroness was most anxious to encourage and promote his labours in this field; and he is universally allowed to have had great success in removing the specious objections which had been advanced by his antagonists against the comparatively recent formation of the present continents. The testimony of Cuvier is sufficient to establish his character in this capacity, and to place him, at the same time, in the first rank of modern geologists. His original experiments relating to meteorology are, however, not less valuable to the natural philosopher; and he discovered many facts of considerable importance relating to heat and moisture. He noticed the disappearance of heat in the thawing of ice, about the same time that Black founded on it his ingenious hypothesis of latent heat. He ascertained that water was more dense about 40° of Fahrenheit than at the temperature of freezing, expanding equally on each side of the

Luc.

maximum; and he was the original author of the opinion since re-advanced by Mr Dalton, that the quantity of aqueous vapour contained in any space is independent of the presence or density of the air, or of any other elastic fluid; though it appears difficult to reconcile this opinion with some of the experiments of our author's great rival, Saussure, a philosopher who, as he very candidly allows, made, in many respects, more rapid progress in hygrometry than himself. De Luc's comparative experiments on his own hygrometer and on Saussure's, show only that both are imperfect; but it may be inferred from them, that a mean between both would in general approach much nearer to the natural scale than either taken separately. It appears also probable that Saussure's is rather less injured by time than De Luc's, which has been found to indicate a greater degree of mean moisture every year than the last.

De Luc was a man of warm feelings, and of gentle and obliging manners, fulfilling on all occasions the various duties of a husband, a father, a master, and a friend; at the same time that his literary and scientific merits, and his unremitting attention to the service of the queen, insured her respect and her kindness. He saw her daily for many years, and in his last illness, which was long and painful, she showed him repeated marks of benevolent regard. He died at Windsor on the 7th of November 1817, leaving a variety of works, which will long be remembered in the scientific world.

1. Recherches sur les modifications de l'Atmosphère, 2 vols. 4to, Geneva, 1772; 4 vols. 8vo, Par. 1784. This contains many accurate and ingenious experiments upon moisture, evaporation, and the indications of hygrometers and thermometers, applied to the barometer employed in the measurement of the height of mountains.

2. Relation de différens Voyages dans les Alpes de Faucigny, 12mo, Maestricht, 1771. This relation was written principally by Dentand, who accompanied the two De Lucs in these expeditions.

3. Account of a new Hygrometer, *Phil. Trans.*, 1773, p. 404. Like a mercurial thermometer, with an ivory bulb, which expanded by moisture, and caused the mercury to descend.

4. Rules for measuring Heights by the Barometer, *Phil. Trans.*, 1771, p. 158. The first correct rules that had been made public.

5. Barometrical observations on the depth of the mines in the Harz, *Phil. Trans.*, 1777, p. 401. Examples of the application of the rules.

6. An Essay on Pyrometry and Arcometry, *Phil. Trans.*, 1778, p. 419. A paper containing many valuable remarks on physical measures in general.

7. Lettres physiques et morales sur l'Histoire de la Terre, 6 vols. 8vo, Hague, 1778. Dedicated to the Queen; relating particularly to the appearance of mountains, and to the antiquity of the human race; explaining the six days of the Mosaic creation as so many periods preceding the epoch of the actual state of the globe; and attributing the deluge to the filling up of cavities supposed to have been left void in the interior of the earth. The whole work is intermixed with interesting observations on men and manners.

8. A second paper concerning some Barometrical Measurements in the Mines of the Harz, *Phil. Trans.*, 1779, p. 485.

9. Lettres sur quelques parties de la Suisse, 8vo, 1781. Also addressed to the Queen.

10. Nouvelles idées sur la Météorologie, 2 vols. in 3, 8vo, Lond. 1787. A very valuable collection of observations and experiments, including some original remarks on electricity.

11. Several papers on Hygrometry, on Vapour, and Rain, on Meteorology in general, on Expansion, and on Refraction, in *Rosier's Journal de Physique*, xxx. xxxii. xxxvi. xxxvii. xliii.

12. Some letters on the Physical History of the Earth, in the *Monthly Review*, enlarged, especially June 1790, and vol. ii. appendix.

13. On Hygrometry, *Phil. Trans.*, 1791, pp. 1, 389. In one of these very important papers the whalebone hygrometer is described.

14. On Evaporation, *Phil. Trans.*, 1792, p. 400. Amongst the fundamental principles laid down in this paper, the independence of vapour and air is asserted.

15. Lettres sur l'Histoire physique de la Terre, 8vo, Par. 1798. Addressed to Professor Blumenbach, and published by Mr Emery, a clergyman at Paris. The substance had already appeared in the *Journal de Physique*, for 1790, 1791, and 1798. We find in this volume an essay written for a prize at Haarlem in 1791, but without success, on the existence of a General Principle of Morality. It

contains an interesting account of some conversations of the author with Voltaire and Rousseau.

16. Lettres sur l'Education religieuse de l'Enfance, 8vo, Berlin, 1799.

17. Bacon tel qu'il est, 8vo, Berlin, 1800. Showing the bad faith of the French translator, who had omitted many passages favourable to revealed religion.

18. Précis de la Philosophie de Bacon, 2 vols. 8vo, Paris, 1802. Giving an interesting view of the progress of natural science.

19. Lettres sur le Christianisme, Berlin and Hanover, 1801, 1803. A correspondence with Mr Teller.

20. Introduction à la Physique terrestre par les Fluides expansibles, 8vo, Par. 1803.

21. Traité élémentaire sur le Fluide Galvanique, 8vo, Paris, 1804.

22. A paper on Lavas, *Journal des Mines*, cxv., Nicholson, xx.

23, 24. Several articles in the *Brit. Critic* and in the *Monthly Mag.*

25. Traité élémentaire de Géologie, 8vo, Paris, 1809; also in English, by Delafite, the same year. This volume is less strictly introductory to geology than the *Lettres sur la Terre*. It is principally intended as a refutation of the Vulcanian system of Hutton and Playfair, who deduced the changes of the earth's structure from the operation of fire, and attributed a higher antiquity to the present state of the continents than is required in the Neptunian system adopted by De Luc after Dolomieu.

26. He sent to the Royal Society, in 1809, a long paper on separating the chemical from the electrical effects of the pile, with a description of the electric column and aerial electroscope, in which he advanced opinions so little in unison with the latest discoveries of the day, especially with those of the president of the society, that the council probably thought it would be either encouraging error or leading to controversy to admit them into the *Transactions*. He had, indeed, on other occasions shown somewhat too much scepticism in the rejection of new facts; and he had never been convinced even of Mr Cavendish's all-important discovery of the composition of water. The paper was afterwards published in Nicholson's *Journal* (xxvi.), and the dry column described in it was constructed by various experimental philosophers. It exhibited a continual vibrating motion, which was made more sensible by the sound of a little bell, struck by the pendulum at each alternation; and the vibration was more or less rapid according to the state of the atmospherical electricity, and according to other circumstances affecting the column: but the motion ceased at last after a continuance of several months, or perhaps years. There are also papers in volumes xxi. xxii. xxvii. xxxiii. xxxiii. and xxxv., mostly on electricity and galvanism, together with one on hygrometry, a letter to Bode on comets, and a fanciful theory of the origin of the heat derived from compression. Some of them are dated from Ashfield, near Honiton, in Devonshire.

27. In the *Philosophical Magazine*, volumes xxxv. xlii. xliii. and xlv., there are also some papers on electricity and geology, especially on that of St Michael's Mount, of Vesuvius, and of Northumberland; and a note on the sympathetic vibrations of the pendulums of two clocks placed near each other.

28. Geological Travels in the north of Europe, 8vo, Lond. 1810.

29. Geological Travels in England, 2 vols. 8vo, Lond. 1811.

30. Geological Travels in Switzerland and Germany, 2 vols. 8vo, Lond. 1813.

31. An Abridgement of Geology, published in 1817, when he was in his ninetyeth year, is mentioned as one of his best works; but it seems to have been only a republication or a translation of some former treatise, perhaps the *Traité Élémentaire*.

(*Philosophical Magazine*, November 1817; Monod and Weiss, in the *Biographie Universelle*, tome xxv. 8vo, Paris, 1820.) (t. v.)

LUCANIA, a district of Southern Italy, extending from the Tyrrhenian Sea on the W. to the Gulf of Tarentum on the E., was bounded on the S. by the Brutians, on the N. by Apulia and Samnium, and on the N.W. by Campania. It derived its name from the Sukanians, a Samnite tribe, who in the third century before Christ, advancing gradually southward, waged an aggressive war with the Oenotrians and the Chones, the original inhabitants of the district, until, after the lapse of less than a century, they had advanced their conquest to the southern extremity of the peninsula. The Brutians, however, soon revolting, drove them back within the limits of the district which they afterwards occupied. Lucania was comprised in the third region of Augustus. One of the wildest parts of Italy, it sent forth from its extensive mountain forests wild swine for the markets, and numerous bears for the amphitheatres of Rome. Its chief rivers, the *Silarus* (Sele), the *Aciris* (Agri), the

Lucania.

Lucanus. *Casuentus* (Basiento), and the *Bradanus* (Bradano), all rise in the Apennines. The first flows westward into the Tyrrhenian Sea, the rest flow eastward into the Gulf of Tarentum. Of the towns, those along the coasts were nearly all of Greek origin, and maintained their independence long after the Lucanians had subdued the rest of the district. Studding the E. shore were *Metapontum*, *Heraclea*, *Siris*, and *Thurii*. On the W. coast stood *Laus Blanda* (Maratea), *Buxentum* (Policastro), *Velia* or *Elea*, and *Pæstum* or *Posidonia* (Pesto). The principal inland towns were *Potentia* (Potenza), *Atina*, *Volceium* or *Volcentum* (Buccino), *Grumentum*, *Nerulum*, *Muranum* (Morano), and *Forum Pompilii* (La Polla). The Lucanians became allies of the Romans during the Samnite wars. Yet they joined Pyrrhus when he invaded Italy B.C. 281, and after the battle of Cannæ they revolted to Hannibal. Their defection on both occasions was severely punished. The Lucanians, in the time of Sulla, were raised to the rank of Roman citizens, and after that period gradually sank into obscurity.

LUCANUS, MARCUS ANNÆUS, was born at Corduba (Cordova), in Spain, in A.D. 38. His father was L. Annæus Mella, a brother of the philosopher Seneca, and a man of equestrian rank, who held the lucrative office of *procurator* for the public revenues. The information which we possess regarding the youth of Lucan is by no means trustworthy. The ordinary account of this period of his life is drawn from an old *Vita Lucani*, and sets forth that, conveyed to Rome at the age of eight years, he was carefully educated by the most distinguished philosophers and rhetoricians of the time, under whose instructions he made surprising progress, and gave early proof of being possessed of extraordinary talents; that, having attracted the attention of the Emperor Nero, he was raised to the senate and honoured by a quaestorship while yet a youth; but having afterwards defeated Nero in a poetical contest, was peremptorily commanded by that monarch to refrain from writing poetry in future. As a whole, this narrative is not reliable; yet it is not destitute of authentic elements. The facts seem to be, that roused to jealousy by the extraordinary precocity of the young Spaniard, and by the admiring laudations which his genius called forth, Nero prohibited him from reciting in public. Burning for revenge, the passionate poet joined the celebrated conspiracy of Piso, in which many of the best citizens of Rome were embarked; but having been betrayed, Lucan was induced, through a promise of pardon, to become informer and denounce his associates. He began by naming his innocent mother Atilia as one of his accomplices, and afterwards revealed the rest. (Tacit. *Ann.* xv. 49, &c.) But this traitorous conduct on the part of Lucan did not stand him in good stead. As soon as the leading conspirators were despatched, Nero gave orders that his successful rival should be put to death, and the only favour granted the informer was the liberty of choosing the mode of his death. Summoning all his firmness, and displaying a wild courage equal to the occasion, the unfortunate youth opened his veins in a warm bath, and as his ebbing strength forsook him, began to repeat aloud his own description (*Pharsalia*, iii. 637) of the death-scene of a young warrior who had perished of his wounds. With those lines on his lips, and at the premature age of twenty-seven (A.D. 65), the poet Lucan expired. He left a wife, Polla Argentaria, to mourn his death, who must have been one of the most remarkable women of her time. It is to her that Statius addresses the birthday ode in honour of Lucan, in which he informs us that the earliest production of the deceased poet was a poem on the death of Hector, and the recovery of his body by Priam; the second, on the descent of Orpheus to the infernal regions; the third, on the burning of Rome; the fourth, an address to his wife Polla; and the last, his only extant work, the *Pharsalia*. The latter production is a heroic poem in ten

books, containing a detailed chronological account of the progress of the contest between Cæsar and Pompey from the passage of the Rubicon to the middle of the Alexandrian war. At this point the tenth book stops abruptly; the remaining portion either having been lost or never completed. There is abundant reason for believing that what we now possess of the poem was composed at comparatively distant intervals. The earlier books of the work are characterized by moderation and liberality, with an offensive admixture of flattery to Nero; while as he advances, the spirit of freedom takes fire in him, and he daringly hurls the fiercest invectives at the head of tyranny, which found itself at that time incarnated in the person of the Emperor Nero. Whether this striking alteration of spirit and manner was awakened by the wanton and progressive cruelty of his imperial patron, or whether it arose from the memory of personal wrong and disgrace, it is impossible to determine.

The poetical merits of Lucan have in all ages been fiercely contested; some considering him equal to Virgil, whilst others have placed him in the lowest rank of poets. Both estimates are alike absurd; the one undiscerningly exaggerative of his merits, the other foolishly depreciatory of his powers. As we might be led to expect from these opposing extremes of criticism, Lucan, when impartially studied, reveals singular excellences and as singular defects. He has all the positive elements of a great poet in him,—deep intellectual insight, exalted imagination, burning enthusiasm, noble feeling, fiery energy, and impressive diction; but he wastes his strength by misdirecting it; his power is so exuberant that it overmasters him; he cannot confine it to the path of effective and harmonious activity; it runs wild and irregular, and often ends in extravagance and folly. Time and study would doubtless have done much to emancipate his powers from the crude and depraved taste under which they laboured; but this was denied him.

The best editions of Lucan are those of Oudendorp (1728), Burmann (1740), Bentley (1760), Weber (1821–31), and Weise (1835). The most useful for all practical purposes is the edition of Weber.

The most notable of the numerous translations of the *Pharsalia* are—in English, by Thomas May (1627), who published (1630) a continuation of the poem to the death of Julius Cæsar; by Rowe (1718); and by Riley (1853). Those in French are by Brebeuf (1655), and Marmontel (1766); in German, by Seckendorff (1695), by von Borck (1749), and by Haus (1792); in Italian, by Bocella (1804).

LUCCA, DUCHY OF. See TUSCANY.

LUCCA (anc. *Luca*), a city of Northern Italy, capital of the above duchy, on the left bank of the Serchio, 12 miles from the sea, and 44 miles W. by N. of Florence by railway. It stands on a rich and fruitful plain, is encompassed by a rampart laid out in boulevards, and consists of clean and spacious, but crooked streets. The town is well supplied with water, brought by an aqueduct from the hills to the S. of the town. This great structure, begun in 1815 and completed in 1832, under the superintendence of Nottolini, measures 2 miles in length, and is supported on 459 arches. The appearance of Lucca, when seen from a distance, is striking, from the number of its towers and spires. Among its numerous ecclesiastical edifices, the principal are,—St Martin's Cathedral, and the churches of Saints Fredianus, Michael, and Romanus. The cathedral was founded in 1060 by Bishop Badagio, afterwards Pope Alexander II., and has frequently received repairs and additions. It exhibits a mixture of the Lombard and Gothic styles, and is profusely decorated with every manner of carving, fresco, and sculpture, from the hands of the most famous Italian artists. The church of St Fredianus was erected in the seventh century by King Pertaric of Lombardy, in honour of an Irishman of royal birth named Fredianus, who had left his native country to visit the city of St Peter, and

Lucca.

Luce Bay
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Lucena.

who was rewarded for his zeal by receiving the episcopal see of Lucca. St Michael's church, founded in 764, and dedicated to the archangel, is built of white marble from the neighbouring quarries, and contains a colossal statue of that personage, besides many excellent carvings and paintings. The church of Romanus, belonging to the eighth century, possesses a celebrated picture of the Madonna by Bartolomeo, and others of less note. The Archbishop of Lucca has many ancient privileges, which have been bestowed on the see at different times by kings and popes. They are now, however, of little value. The palace of the duchy is situate here, and, though unfinished, is an extensive edifice, with a grand marble staircase, and contains a library of 40,000 volumes. One of the most interesting buildings is the poor-house, once the town-hall, built of red brick. It was erected in 1413, and served both for a stronghold and a palace. The most complete of the Roman remains here is the Piazza del Mercata, a ruined amphitheatre of two storeys of arches, and estimated to have held 10,700 spectators. It is now used for the town markets. The manufactures of the town are unimportant, chiefly comprising silk, wool, and paper. Silk, however, was at one time extensively manufactured here, and in the vicinity it was produced for the first time in Italy.

The ancient *Luca* was a town belonging to the district of Etruria, although not possessed by Etruscans; and afterwards was included in Liguria. At the end of the third century B.C., however, it fell into the hands of the Romans, and, according to Velleius, received a Latin colony in 177 B.C. In 49 B.C. it was raised to the rank of a municipal town, and was frequently honoured at that time by the presence of the chief generals and senators of Rome, who formed the plans of their campaigns and political plots here. It did not, however, occupy a conspicuous position till after the fall of the Roman empire. The Goths found it strongly fortified, and a place of some importance. But it was not till the Lombard dynasty had declined that it rose to its greatest height. The twelfth century saw it a free town, governed by its own consuls, until dissensions among the aristocracy again reduced it to the state of a possession held by the most powerful of the nobles. After it had been, however, in the hands of the lords of Pisa for several years, a charter was obtained by the inhabitants from Charles IV. for the sum of 300,000 florins, by which it regained its freedom in 1370. But this freedom was gradually infringed, until the government became a regular despotism; the whole power being in the hands of a few noble families. This state of affairs was rudely changed, however, in 1799, when the French under Serrurier entered the town and seized all the most valuable arms, besides exacting a large sum from the people. Bonaparte, in dividing his empire, bestowed Lucca on his sister Elisa. It is now under the Grand Duke of Tuscany. Pop. 24,894. The famous baths of Lucca are 15 miles N.N.E. of the town.

LUCÉ BAY, an inlet of the Irish Sea, on the S. coast of Scotland, Wigtonshire, so called from the small River Luce which it receives at its head. It divides the county by a broad and deep indentation into two peninsulas, the one terminating in the Mull of Galloway on the W., and the other in Burrow Head on the E. of the bay. It is 19 miles broad at the entrance, 16½ miles long, and about 7 miles broad at the head. Owing to the shifting sands of the bay, it is considered dangerous to navigation.

LUCENA, a town of Spain, province of Cordova, in a beautiful plain near the small River Cascajar, 36 miles S.S.E. from Cordova. The town is composed of 3000 houses, mostly well built and commodious; the streets being also broad and well paved. The Plaza del Coso contains a fine public park planted with trees. The parish church was begun in 1498 on the ruins of a mosque, and finished in 1544. It is built of freestone, and measures about 135 feet

in length by 71 in breadth. On the high altar is a very fine copper bas-relief of the Passion. The town likewise contains 3 hospitals, 3 public schools, and 10 convents, of which the most remarkable, in an architectural point of view, are those of St Augustin and of the Bare-footed Carmelite Nuns. The town enjoys a very salubrious climate, and is well supplied with water, there being 15 public fountains in and near it, besides private wells to almost every house. About 3½ miles E. of the town are the mineral waters of the Horcajo, containing a large proportion of sulphur, and resorted to in cutaneous diseases. The surrounding country is fertile and well watered, producing oil, wine, and cereals, and affording excellent pasturage for horses, cattle, and hogs. The principal branches of industry are the hardware and pottery manufactures. Their lamps are especially celebrated, being made of bronze, copper, &c., variously alloyed, and very beautifully worked; they not only supply Spain and Portugal, but are exported to the contiguous districts of France, to Algiers, and the Havannah. The earthenware manufacture consists chiefly of the large jars with which they supply all Andalusia, and which are used for the storing of oil, wine, and brandy. Some hard white soap is also made. The commerce is confined to the exportation of cereals, oil, vinegar, brandy, lamps, and the above-mentioned jars. There is a yearly fair on the 8th, 9th, and 10th of May, in which all sorts of hardware utensils in tin and copper, earthenware, crystal, and cattle, are exposed for sale.

There are numerous Roman and Gothic remains in Lucena. It was taken from the Moors early in the fourteenth century, and it was in the attempt to recapture it in 1488 that King Boabdil was taken prisoner. Lucena has given birth to various celebrated men, of whom may be mentioned Alvarez de Solomayor, Baraona Solo, author of *Las Lagrimas de Angélica*, and Folch de Cardona, author of a work on military geometry. Pop. 16,652.

LUCERA (the ancient *Lucceria*), a town of Naples, province of Capitanata, on an eminence 12 miles W.N.W. of Foggia. It is surrounded by old walls having five gates, and the houses are generally good, though the streets are narrow, ill paved, and dirty. The cathedral, formerly a Saracenic mosque, has thirteen beautiful pillars of *verd antique*, supposed to have originally belonged to a temple of Apollo. The Bishop's palace is considered the finest edifice in Apulia. The Tribunale is an extensive pile of buildings, including not only the courts of justice for the province, the register office, &c., but also the residences of the president and judges, and the public prisons. Lucera has also a royal college and a fine private museum. About a quarter of a mile from the city, and on the edge of the same eminence, stands the castle of Lucera, a ruined fortress, erected by Frederick II. Three annual fairs are held here; and an active trade is carried on in cattle and cheese. Lucera is said to have been founded by Diomed, and was the capital of Daunia under the Greeks. In the war between Rome and Samnium it had apparently, with the other Apulians, joined the former, and was taken by the Samnites in B.C. 321. The following year it was besieged by the Romans, and after an obstinate resistance, fell into their hands. In B.C. 314 it revolted to the Samnites, but was speedily recovered by the Romans, who put the most of the inhabitants to the sword, and sent thither a body of 2500 colonists to supply their place. It was destroyed in the wars of the seventh century, and lay in ruins till 1239, when the Emperor Frederick II. established here a colony of Silician Saracens, and granted them great privileges. In 1269, however, Charles of Anjou expelled from the Neapolitan dominions such Moors as refused to embrace Christianity, and converted the mosque of Lucera into a church. Numerous antiquities of various periods have been discovered in and about Lucera. Pop. about 12,000.

Lucera.

Lucerne.

LUCERNE, or **LUZERN**, a central canton of Switzerland, having the canton of Aargau on the N., those of Aargau, Zug, and Schwytz on the E., those of Bern and Unterwalden on the S., and that of Bern on the W. It is situate between N. Lat. 46. 47. and 47. 17., and between E. Long. 7. 50. and 8. 29. Its greatest length is 33 miles, its greatest breadth 27 miles, and it has an area of 586 square miles. Generally plain in the N. and irregular in the centre, it is very much broken by ranges of the Bernese Alps in the S., none of which rise, however, above the snow line. Of those ranges the highest is Mount Pilate, reaching in the Tomlishorn, its loftiest peak, an elevation of 7122 feet above sea-level. The only valley of an extensive kind is Entlebuch, 27 miles in length, and inclosed by mountains covered with deep forests, or green pasture land. The Reuss and Little Emmen drain the S. and E. of the canton, and the Wigger, Sur, and Vinon flow all in a northerly direction and join the Aar, an affluent of the Rhine. Bounded partly on the E. by the Lake of Lucerne, and bordering on the lakes of Zug and Schwytz, this canton comprises within itself the small lakes of Sempach, Baldegg, and Mauern. Limestone and sandstone abound in the mountains, and gold has been found in several of the streams. Coal exists to a limited extent in several places, but is not worked. The climate is generally mild, except in the high lands, where snow often lies till June. The soil, though occasionally sandy, is generally fertile, and agriculture is well understood. The cereals raised are in general sufficient for the consumption. The vine is cultivated in the more favoured spots, and chestnuts, figs, and almonds attain maturity on the banks of the Lake of Lucerne. The pastures are very extensive, and of excellent quality, particularly those of the hill-sides which flank the valley of Entlebuch. There is a considerable transit trade; but manufactures, of which the chief are linen weaving and spinning, have made but little progress. The population of the canton in 1850 was 132,843, almost entirely adherents of the Roman Catholic Church, which is the established religion of Lucerne. Of the entire population, 1563 were Calvinists. The government is in the hands of the Great Council, consisting of 100 members, 80 of whom are chosen by the people, and the remaining 20 by the council itself. The Little Council, consisting of 15 members, with its president, or *avoyer*, or *schultheiss*, are elected by the Great Council for three years, and exercise the executive. The canton is divided into 5 bailiwicks, and 74 communes. Lucerne is one of the three *directing* cantons, and occupies the third rank as a member of the Swiss confederation. It contributes annually L.1494, and furnishes a contingent of troops of 3717.

LUCERNE, the chief town of the above canton, lies at the N.W. extremity of the Lake of Lucerne, at the point where the River Reuss, which divides the city, issues forth from the lake. It is exceedingly picturesque, and is walled in towards the land, and surrounded by a series of watch-towers, erected in 1385. Its chief peculiarity, however, is its covered bridges which span the Reuss, and are ingeniously ornamented with curious pictures. The lowest, or Mill Bridge, is hung with paintings, now nearly obliterated, of the "Dance of Death;" the upper, or Kapellbrücke, has 77 pictures suspended from its timbers, illustrative, on the one side, of the pious acts of the patron saints of the place, and, on the other, of memorable incidents in Swiss history. The longest bridge, the Hofbrücke, was removed in 1852, and the only uncovered one is Reussbrücke, which is passable for carriages. The town is clean and well built, and is situate amid exquisitely beautiful scenery, on the margin of the finest of the Swiss lakes, between the magnificent heights of Pilate and Righi. Its principal public buildings are—a cathedral, an Ursuline convent, a town-hall, an arsenal with ancient armour and trophies taken at Sempach, &c., a

large town hospital, a poor-house, an orphan asylum, a jail, and a theatre. It has a lyceum with 14 professors, to which an excellent public school is attached. The educational establishments of Lucerne are highly spoken of for their efficiency. The most interesting monument connected with the place is that in a garden outside the city walls, erected to the Swiss guards, who fell at Paris in 1792, while defending the Tuileries. It was designed by Thorwaldsen, and executed by Ahorn of Constance. "It represents a lion of colossal size, wounded to death, with a spear sticking in his side, yet endeavouring in his last gasp to protect from injury a shield bearing the *fleur-de-lis* of the Bourbons, which he holds in his paws. The figure, hewn out of the living sandstone rock, is 28 feet long and 18 high; and whether as a tribute to fallen valour, or as a work of art of admirable design and no mean execution, it merits the highest praise" (Murray's *Hand-book*). Lucerne is not a place of any considerable manufactures; the chief are cabinet-work, and silk and cotton fabrics. It has some transit trade, however, and it finds a market for its principal fabrics in Italy. There is a railway nearly open to Aarberg on the road to Basle. Pop. 10,068, of whom 300 are Protestants.

LUCERNE, *Lake of*, in the centre of Switzerland, called in German *Vierwaldstättersee*, or "The Lake of the Four Forest Cantons," from its being inclosed by the cantons of Schwytz, Uri, Unterwalden, and Lucerne, is considered to be the grandest in Europe in point of scenery. It is the largest lake in Switzerland, and its surface is about 1400 feet above sea-level. It inclines to a cruciform shape, but is very irregular. Its extreme length is 24½ miles, and its average breadth 3 miles; in depth it varies from 300 to 900 feet. All varieties of scenery are to be met with on its shores, from soft beauty to stern grandeur and sublimity. In the latter respect, the farther end of it, called the Bay of Uri, is unsurpassed. Many of the scenes in Schiller's *Wilhelm Tell* are localized around this lake. The violent storms to which it is exposed render its navigation dangerous. Steamers ply several times a day during summer between Lucerne and Flüelen, and other parts on the shores of the lake.

LUCIA, *St.*, one of the British West India Islands, Windward group, lying about 30 miles S. of Martinique, in N. Lat. 13. 50., W. Long. 60. 58. It is 32 miles in length from N. to S., by 12 in extreme breadth, and has an area of about 235 square miles, or 150,000 acres. It is longitudinally divided by a chain of mountains generally from 1200 to 1800, and in some cases to 2000 feet high, densely clothed with the finest timber. These are of volcanic formation, and assume the most fantastic forms, abounding in deep chasms and pointed eminences. From either side of this chain branches of lesser altitude go off towards the coast, forming plains and valleys of various sizes. At its southern extremity are two mountains of volcanic origin, called the Sugar Loaves, which rise nearly perpendicularly from the sea in the form of parallel cones to the height of about 2700 feet. They are covered with evergreen foliage, and mark the entrance into the deep and beautiful bay of Soufrière. The valleys throughout the island, as well as the plains upon the coast, are fertile, being well watered by numerous streams, and are under good cultivation. The island is divided into two territories,—Basseterre, the low or leeward portion, which is well cultivated and the most populous, though the prevalence of stagnant waters and morasses renders the climate very unhealthy; and Capi-terre, the high or windward territory, which is also very unhealthy, but is becoming less so as the wood on the high lands is being cleared away. The climate is very moist, as the trees on the mountains attract the clouds, and hence render the island subject to frequent and heavy rains for nine or ten months in the year. The quantity of rain that

Lucerne
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St Lucia.

St Lucian. fell in 1851 amounted to 94 inches, and in that year the thermometer ranged from 71° to 83° Fahr.

The extent of land under each description of crop in 1854 and the three preceding years was,—

	1851. Acres.	1852. Acres.	1853. Acres.	1854. Acres.
Canes	3,015	3,563	3,489	3,290
Coffee	155	137	130	97
Cocoa	134	109	89	87
Provisions	1,013	1,136	2,423	1,154

The quantities of various articles produced in each of the above years were,—

	1851.	1852.	1853.	1854.
Sugar.....lbs.	6,691,800	7,130,560	6,782,700	7,414,100
Coffee..... "	18,620	25,938	6,051	10,250
Cocoa..... "	15,143	40,358	21,600	17,480
Rum.....gallons	45,058	66,929	58,348	77,751
Molasses ..	159,540	206,695	214,712	208,625

The quantities and value of articles exported in 1854 were,—

Articles.	Quantities.	Value.	To United Kingdom.	To British Colonies.	To Foreign States.
Cocoa	lbs. 148,983	L.1,491	L.67	L.1,424	...
Goods, Brit. manufact.	packages 361	1,417	35	1,230	L.151
Logwood ...	tons 1,093	2,368	1,077	...	1,311
Molasses.....	galls. 116,490	2,934	1,655	1,279	...
Rice	cwt. 40	30	...	30	...
Rum	galls. 14,364	1,428	1,428	...	...
Sugar, Muscovado....	cwt. 59,242	41,468	41,462	6	...
Other articles	...	4,700	300	2,699	2,702
Total value.....		L.55,836	L.4 6,004	L.6,668	L.3,164

The total value of imports in 1854 (principally articles of British manufacture, flour, dried fish, butter, live stock, lumber, salted meat, olive-oil, wine, rice, and tobacco), was L.96,809; being L.41,996 from United Kingdom, L.27,880 from British colonies, and L.26,433 from foreign states. The net amount of the general revenue in 1854 was L.14,098; being custom duties on imports, L.6482, on tonnage, L.744, assessed and other taxes, L.6872. The net expenditure for that year was L.13,565. The total population in 1854 was 24,123, of whom 430 were male and 517 female whites, 11,081 male and 12,095 female persons of colour. The births, deaths, and marriages were respectively 1069, 2494, and 906. The great number of deaths in that year was principally caused by the cholera; the average of the four previous years being only about 430. This plague had also great influence on the number of marriages, which in that year was more than quadruple the usual annual average. The chief town of the island is Castries, which contains about 3000 persons.

St Lucia was first colonized by English settlers in 1639, but these were soon after driven off by the Caribs. About 1650 the French effected a settlement, and from that time to 1803, when it was finally captured by the English, it belonged alternately to France and England. The government is administered by the commanding officer of the troops, a lieutenant-governor, and an executive council, consisting of the colonial secretary, the attorney-general, and the second military officer. There is also a legislative council, composed of five official and five non-official members, in which the colonial secretary and attorney-general have seats and votes, and of which the commanding officer is president. The laws of St Lucia, except in so far as they have been altered by orders of council, are the laws of France, antecedent to the Code Napoleon.

LUCIAN, Sr, a learned presbyter of Antioch, said to have been born at Samosata, the birthplace of the celebrated satirist of the same name, about the middle of the second century after Christ. Among the old ecclesiastical writers we find him assigned a distinguished place for his

learning and piety. Eusebius (*Hist. Eccles.*, viii. 13) speaks admiringly of his "unblemished character;" and Jerome (*De Viris Illustr.*, cap. lxxvii.) bears a similar testimony. The latter writer refers to him as "laborious in the study of the Scriptures;" so much so, that not only was his revised edition of the *Septuagint* used by the churches from Constantinople to Antioch, but this corrected version of the Old Testament was known by the name of Lucian. Jerome also speaks of him as the author of several epistles and theological tracts; and we find in Socrates (*Hist. Eccles.*, lib. ii., c. 10) an extant confession of faith drawn up by Lucian's hand. He died a martyr in the reign of Diocletian, A.D. 311, and was buried at Helenopolis, in Bithynia.

There is not a little obscurity, and a great deal of consequent dispute, respecting the views held by Lucian on the doctrine of the Trinity. Some have maintained that the absence of any allusion to his opinions on this point by Jerome and Athanasius, and the respect in which he was held by the Trinitarian fathers, afford a sufficient refutation of the charge of heterodoxy brought against the martyr of Antioch. Others, again, on the strength of the testimony of Epiphanius and Philostorgius, who allege that Arianism and Lucianism were all but synonymous, are inclined to hold that the presbyter was a heretic. There are those, again, who maintain a middle course, and favour the opinion that Lucian's views were not quite orthodox, inasmuch as Alexander (in Theodoret, *Hist. Eccles.*, lib. i., c. 4) says that three successive bishops of the Catholic Church excluded him for advocating the doctrines of Paul of Samosata. It is, however, generally believed that he returned to the bosom of the church before his death.

A great deal of confusion respecting the opinions of this eminent scholar and truly pious man has obviously arisen by confounding him with another Lucian, a follower of Marcion, and the author of numerous forgeries, such as the *History of the Nativity of the Virgin Mary*; the *Protangelion, or Gospel of James*; the *Gospel of Nicodemus*, &c. This individual is termed by Epiphanius, Lucian the Elder (*Har.*, xliii., c. 1.) Some call him Lucan, others Lucius and Leucius, &c. That the creed of the latter Lucian was heretical there is no doubt; but how far he has been confounded with his namesake of better reputation it is impossible to determine.

LUCIANISTS, or LUCANISTS, a religious sect (or sects) who derived their name from either of the Lucians just alluded to; or, what is most probable, from both. It is not unlikely that the first who bore the name were the disciples of Lucian the Elder, the Marcionite; and that afterwards it was applied to those who adhered to the tenets of the presbyter of Antioch, which were in all probability slightly tinged with Arianism.

LUCIANUS, a celebrated Greek writer, was born of poor parents at Samosata, the capital of the Syrian province of Commagene. The materials for his biography are very scanty, and are derived chiefly from hints in his own works. He is generally supposed to have lived during the reigns of the Antonines and Commodus; and Reitz, after a minute and able investigation, determines the date of his birth to be about A.D. 120. A talent which he showed in early boyhood for moulding little waxen figures seemed to indicate an adaptation for the trade of a sculptor; and accordingly, at the age of fourteen, he was apprenticed to his maternal uncle, a statuary of some note. Happening however, in his first lesson, to break a marble tablet which he was polishing, he received a severe beating from his uncle. This affront he resented by running away, and persistently refusing to return. He then contrived by some means to devote himself to the study of rhetoric and literature. About the same time, also, he seems to have applied himself to law; for shortly after this period, according to

Lucianists
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Lucianus.

Lucian.

Suidas, he settled down at Antioch as an advocate. Want of success, however, forced him to become a rhetorician; and making a professional tour, as was customary for those of that calling, he entered Greece, and fixed his abode at Athens. There he remained until his crude knowledge of the Greek language had ripened into a perfect intimacy with the graces of the Attic dialect. There, also, he formed a friendship with the philosopher Demonax, whom he has eulogized so highly. He then passed into Italy, and after staying for some time in Rome, travelled into Gaul. In this latter country he appears to have resided from ten to fifteen years, rapidly acquiring both wealth and fame.

About his fortieth year he left Gaul, but whether he returned through Macedonia to his native city, according to Massieu, or fixed his abode at Athens, according to Wieland, is uncertain. It is agreed, however, that after this period he abandoned the rhetorical profession; and devoting himself to the task of an author, composed the greater part of his works. From his writings we infer that he also travelled much; and while sojourning in Greece, A.D. 165, witnessed the self-sacrifice of the enthusiast Peregrinus at the Olympic games. In his later years he was appointed a procurator in Egypt, probably by the Emperor Commodus. He died at an advanced age. That he was torn to pieces by dogs (as Suidas relates) there is no sufficient ground for believing.

Lucian is most noted as a satirist, and in this capacity he possesses a keen insight into human foibles, great powers of derision, a graceful diction, and a playful and fertile fancy. His great deficiency lies in mistaking both the province and the purpose of satire. Instead of lacerating only the vile and the meretricious, his lash falls indiscriminately upon virtue and vice, upon truth and falsehood. Instead of probing the wound to heal it, he tortures it merely to see his victim writhe. Thus he attacks Christianity and natural religion—not with the view of substituting other systems in their place, but simply to hold them up to derision. If his sneers ever put vice and folly to the blush, the result arose more from accident than from the design of the writer. Accordingly Lucian's satire, instead of that moral tone so often effectual in elevating this species of writing into the atmosphere of poetry, not unfrequently shows a coarseness both in taste and sentiment.

The *Dialogues* of Lucian are at once the best and most bulky part of his works. Of these, the most notable perhaps are the *Dialogues of the Dead*, which, traversing the entire circle of human weakness and error, expose the hollowness of fame, wealth, and beauty, the absurd tenets of the vulgar, and the endless jargon of the sages. In his *Sale of the Lives*, the auction of the different philosophers affords him a good opportunity for facetiously describing the market value of the several philosophical systems. The same strain of ridicule is pursued in his *Symposium*, in which the various sages who had been invited to a wedding banquet, begin a contest with grave words, but end it with hard blows, and amid general uproar. A more legitimate satire is *Jupiter Convicted*, in which the king of the gods is proved before his own face to be utterly powerless, and the mere puppet of destiny. This attack upon the popular mythology Lucian followed up by aiming, in his *Jupiter Tragedus*, at the very existence of the gods. In one of his best pieces,—*The Dream of Micellus or the Cock*,—a cobbler, Micellus, discovers Pythagoras under the semblance of a cock, and on plucking two feathers from the tail of the philosopher, becomes invisible, and is thus enabled to pass through the mansions of the rich, and view their vice and miseries. *Timon, or the Misanthrope*, is written in his best manner.

Lucian's romances include *Lucius, or the Ass*, and *The True History*. The former is supposed by Photius to be founded on a tale by Lucius of Patrae. The

latter was intended as a caricature of all extravagant narratives, including the tales of Ctesias and Iambulus, and the *Odyssey* of Homer; and may be considered as the prototype of Swift's *Gulliver*. Among Lucian's miscellaneous works, the ablest is that entitled *How to write History*. The best edition of Lucian is that of Hemsterhuis and Reitz, 3 vols. 4to, Amsterdam, 1743, supplemented by another volume entitled *Lericon Lucianum*, by K. K. Reitz, Utrecht, 1746. There are other editions by the Bipont Society, 10 vols. 8vo, 1789–93; by Lehman, Leipsic, 9 vols. 8vo, 1821–31; and by Dindorf, 8vo, Paris, 1840. Lucian has been translated into German by Wieland, 6 vols., Leipsic, 1788–9; into French by De Ballu, 6 vols. 8vo, Paris, 1788; and into English by Dr Franklin, 2 vols. 4to, London, 1780, and 4 vols. 8vo, London, 1781–82.

LUCIFER, Bishop of Cagliari, and founder of the Luciferians, first appears in history as a zealous antagonist of Arianism. In 354 he was deputed by Liberius, Bishop of Rome, to advocate the cause of Athanasius at the council of Milan, an office which he discharged with such persistent boldness, that he and his fellow-legate, Eusebius of Vercelli, were banished by the Arian emperor, Constantine. After his place of exile had been changed several times without producing any corresponding alleviation of his sufferings, he settled down at Eleutheropolis, in Syria, and there wrote his chief work, *Ad Constantium Augustum pro Sancto Athanasio, Libri II.* The unbridled invective and outrageous vehemence of this book were not more remarkable than the boldness of Lucifer in avowing the authorship, when afterwards interrogated by the emperor. Soon after this Lucifer seems to have been removed to Egypt. On his release from exile at the death of Constantius, the council of Alexandria commissioned him, along with Eusebius, to heal the division in the church of Antioch that had arisen from the supposed Arianism of Meletius, bishop of that see. Instead, however, of fulfilling his duty, he widened the schism by attempting to place Paulinus in the bishopric, and thus laid himself open to a reproof from Eusebius and his other long-trying friends. Chafing under the rebuke of all sections of the church, and displeased with the decree of the Alexandrian council for readmitting into ecclesiastical communion those bishops who had temporized with the Arians, Lucifer withdrew, in 363, to his native island of Sardinia, and there founded the small sect known by his name. He died about A.D. 370. Besides the book mentioned above, his other works are—*Epistola ad Eusebium*; *De non Conveniendo cum Hæreticis*; *De Regibus Apostolicis*; *De non Parcendo in Deum delinquentibus*; *Moriendum pro Filio Dei*; *Epistola ad Florentium Magistrum Officiorum*; and *Epistola ad Catholicos*. The last is not extant. Deficient in method and argument, and pervaded by an acrimonious and intolerant spirit, these works merit preservation solely in virtue of the many scriptural quotations which they contain. They were first collected and published by John du Tillet, Bishop of Meaux, Paris, 8vo, 1563, and afterwards reprinted in the *Magna Bibliotheca Patrum*, 1618, and in the *Bibliotheca Patrum* of Galland, folio, Venice, 1770. The best edition is that of the Brothers Coleti, folio, Venice, 1778.

The *Luciferians* (who did not long outlive their founder) disowned all who had ever been tainted with Arianism and all who countenanced those who had been reclaimed from that creed. They renounced, accordingly, all the Christian world beyond their own confined pale. Augustine supposes that they also held that the soul, like the carnal nature, was transmitted from parent to child.

LUCILIUS, CAIUS, a Roman knight, who is generally considered the inventor of satirical composition,—at least of that new form adopted by Horace, Persius, and Juvenal. Of his personal history we can collect only a few facts. He was born 148 B.C. at Suessa (*Sessa*), a city of the Aurunci,

Lucifer

|| Lucilius.

Lucken-
walde
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Lücke.

in Latium (Juv. i. 20). He attended Scipio Africanus in the war against Numantia, B.C. 134, at an age when he could scarcely be expected to serve in arms, and at that time he acquired the friendship of the younger Scipio, and of Lælius (Vell. Pat. ii. 9). Lucilius died at Naples in 103 B.C. His works consist of thirty satires, epodes, hymns, a comedy entitled *Nummularius*, and a *Life of Scipio the Elder*. Of his Satires, upwards of 800 fragments remain, the longest of which, however, amounts only to thirteen verses. Yet even in these stray remnants one can detect traces of that pungent wit and merciless rebuke which are mentioned by Juvenal (i. 165) as causing the victims of Lucilius to tremble. His blows were openly aimed at vice and folly in whatever rank or under whatever dignity they appeared. More marked, however, by strength than by purity and finish, his poetry is compared by Horace to a river bringing down particles of gold and mud mingled together; a criticism which is probably just, in spite of the protest made against it by Quintilian in his *Institutions*. Of the thirty satires of Lucilius, the first twenty and the thirtieth seem to have been written in hexameters, and to have been the first specimens of that measure among the Romans. In the rest, the iambus and trochæus appear to have been used. The fragments of Lucilius have been published by Dousa, with learned notes, Leyden, 1597, Amsterdam, 1661; and reprinted by Volpi, Padua, 1735. They are included in Maittaire's *Corpus Poetarum Latinorum*, London, 1713, and are appended to the *Persius* of Achaintre, 8vo, Paris, 1811.

LUCKENWALDE, a town of Prussia, in the province of Brandenburg, situate on the River Nuthe, on the Berlin and Anhalt Railway, 31 miles S. of the former city. It has woollen and linen factories, and manufactures scythes, leather, paper, and spirits. It has a court of justice, and a parish and burgh school. Pop. 7500.

LÜCKE, GOTTFRIED CHRISTIAN FRIEDRICH, one of the most learned theologians of Germany, was born at Egehn, in the duchy of Magdeburg, 23d August 1792. He received his early education at the gymnasium of his native city, and after the Easter of 1810 studied theology for two years at Halle, under Knapp and Gesenius. From Halle he removed to Göttingen, where he continued his studies under Planck; and here he became first known from his prize essay on the church of the apostolic age (*De Ecclesia Apostolica*, Gött. 1813). The publication of this little work procured him at once the office of repetent in the theological faculty. It also drew him into close literary friendship with Bunsen, Ernest Schulze, Brandis, Lachmann, and others, who were students and aspirants for literary distinction about the same time. Lücke was soon afterwards drawn by the personal influence of Schleiermacher to Berlin, where he passed as licentiate of theology. In 1817 he published at Göttingen his *Grundriss der Neutestamentlichen Hermeneutik*, a youthful but brilliant attempt to mark out the limits of his favourite study, that which he delighted to designate as Christian philology. In the spring of 1818 he was appointed extraordinary professor of theology at Bonn; and in the following autumn he received promotion to an ordinary professorship. Here he devoted himself with the greatest enthusiasm to the study of exegesis and of church history. Besides contributing to the *Theologische Zeitschrift* and the *Christliche Zeitschrift* of Bonn, he about this time began his *Commentary on the Writings of John* (4 vols., Bonn, 1820-32); and to the same period belongs his *Trilogie* with Nitzsch and Sack, and his celebrated letter to Delbrück (Bonn, 1827) on the relation of Scripture to the rule of faith. In 1827 Lücke succeeded Staudlin as professor of systematic theology at Göttingen, where he continued to reside till his death in Feb. 1855. Lücke contributed valuable papers to the *Studien und Kritiken*. To him especially we owe many biographical notices of the great men with whom he had

been closely associated in study, and whose names form landmarks in the progress of theological literature. The best known of these biographical sketches are those of Planck (1835), of Schleiermacher (1834), and of De Wette (1850). Towards the close of his life, he contributed to the *Deutsche Zeitschrift für Christliche Wissenschaft und Christliches Leben*; and during the conflict with Strauss, he wrote anonymously a little tract entitled *Strauss und die Züricher Kirche* (1839).

It is undoubtedly as a commentator that Lücke deserves chiefly to be remembered. In common with the whole school of Schleiermacher, to which he belonged, he gave a marked preference in study to the writings of the apostle John, and these he has illustrated with a freshness and vigour at that time unequalled in the whole library of comment. Beyond all his compeers he is the artist of exposition; and in the interest with which he handles dull details of criticism to bring out the hidden beauties of Scripture, he is inferior only to Bengel and Stier. He is, however, too often led astray by his preferences for the fourth Gospel, and his labours have lost much of their interest since the attack of Strauss has given a wider range to modern German criticism, and has shown the danger of a false preference in a matter so vital to the interests of Christendom. In an honest recoil from dogmatism, which he hated instinctively and combated fiercely, Lücke has often unfortunately stopped short in the scrutiny of notorious difficulties, and left them unsolved, when another step in the analysis would have sufficed to clear away every trace of doubt. The greatest blot on his pages is his ascription of the Apocalypse to an unknown author, whom he supposed to have flourished in the reign of Nero; but his greatest merit remains, of having been one of the foremost and the most powerful to break up the dominion of rationalistic criticism, and to clear the way for a philology more thoroughly Christian even than his own.

LUCKNOW, a city of Hindustan, and the capital of the province of Oude, situate on the S. bank of the River Goomty, which is navigable for boats of a common size at all seasons of the year, and falls into the Ganges between Benares and Gazypoor. At the north-western extremity of the city is a bridge, a very noble Gothic edifice of stone; another to the S.E. is formed of boats. A complete iron bridge was, in 1816, sent out from England in sections, but the death of the ruling prince having stayed the progress of the undertaking, it long remained suspended in consequence of the reluctance of the new sovereign to complete a project commenced by a predecessor. At length, after the lapse of about thirty years, the bridge was erected, and now forms a conspicuous ornament of the city. The streets where the lower classes reside consist of mean houses built of clay, "with the filthiest lanes between them," says Bishop Heber, "that I ever went through, and so narrow that we were obliged to reduce our front, and even a single elephant did not pass very easily." "A swarm of beggars," he continues, in the lively description which he gives of the aspect of the town and its population, "occupied every angle, and the steps of every door, and all, or nearly all, the remaining population were, to my surprise, as much loaded with arms as the inhabitants of the country,—a circumstance which told ill for the police of the town, but added considerably to its picturesque effect. Grave men in palanquins, counting their beads, and looking like moulahs, had all two or three sword or buckler lacqueys attending on them. People of more consequence, on their elephants, had each a retinue of shield, spear, and gun, little inferior to that by which we were surrounded; and even the lounging people of the lower ranks in the streets and shop-doors, had their shields over their shoulders, and their swords carried in one hand." Lucknow is a very ancient city. It was the residence of the early governors or nabobs

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of Oude, but was abandoned by Shujah and Dowleh after the battle of Buxar; on his death in 1774, however, his successor returned to it, and the bankers and men of property having accompanied the court, Lucknow became one of the largest and richest towns in Hindustan. At the present time the city is represented as displaying a varied, lively, and even brilliant prospect, when viewed from a position elevated above the general height of the buildings. In advancing into the town from the outskirts above described, the buildings begin to improve, though the streets continue to be equally narrow. Some of the streets are, however, more spacious; and one in particular is mentioned as being both wide and handsome. It is called Chinka Bazar, or Chinese Market, and has at each end a handsome gateway. Heber describes it as wider than the High Street at Oxford, but having some distant resemblance to it in the colour of its buildings and Gothic style of the greater part of them. The bishop adds that Lucknow appeared to have more resemblance to some of the smaller European capitals, such as Dresden, than any other town which he had seen in India. There are several palaces in Lucknow belonging to the late king, but none of them are very striking buildings. There is one close to the British residency, which is merely a cluster of mean houses, with some morsels of showy architecture intermingled like the offices of a college. There are many stately khans, and some handsome mosques and pagodas, scattered in different corners of the most wretched alleys. The most striking buildings in Lucknow are the tombs of Nawab Saadut Ali and other princes of the dynasty, and the imambarah. The latter building consists of two courts, rising with a steep ascent one above another. It contains, besides a splendid mosque, a college for instruction in Mussulman law; apartments for the religious establishment maintained here; and a noble gallery, in the midst of which, under a brilliant tabernacle of silver, cut glass, and precious stones, lie buried the remains of its founder, Asuph ad Dowlah. The whole is in a very noble style of eastern Gothic, and is distinguished by richness and variety, as well as by the just proportions and general good taste of its principal features. Amongst the curiosities in the neighbourhood is Constantia, the residence of the late General Martin, who, from being a common soldier, rose to a high rank in the company's army. His house is a large and whimsical building, and the grounds are laid out in the worst possible taste, displaying in the outline and arrangements the eccentric genius of the contriver. His body is deposited in a sarcophagus in one of the lower apartments. A large share of his vast wealth was devoted to charitable purposes; and a college called after the founder "La Martiniere," preserves his memory in the city where his fortune was accumulated and his eccentricities indulged. The population of Lucknow is estimated at 300,000; and Bishop Heber is of opinion that it is sufficiently crowded to contain that number. The city is 650 miles travelling distance from Calcutta, from Delhi 280, from Agra 202, and from Benares 189 miles. E. Long. 81., N. Lat. 26. 51. The long-continued misgovernment of the territory, of which this place is the capital, compelled the British government at length to assume the administration of public affairs. The king refusing to accede to the proposed conditions, was deposed, and a liberal allowance assigned for his maintenance. (See OUDE.) (E. T.)

LUCKPUT BUNDER, a town of Hindustan, province of Cutch, situate about 30 miles up the Koree River or Salt Creek, which communicates with the Great Western Runn, and is only navigable for small vessels. It is defended by a fort, which is situate on the brow of a hill. It is not estimated to contain more than 2000 inhabitants, 500 of whom are Sepoys; and it is at present a place of little trade. Lat. 23. 50., Long. 68. 48.

LUCON (ancient *Lucio*), a town of France in the de-

partment of Vendée, situate on the edge of a marshy plain, at the extremity of a canal of the same name, 10 miles in length, which traverses the marshes of Fraissy and St Michel-en-l'Herm, and joins the sea at the little Bay of Aiguillon. It is large, with dirty tortuous streets, and very unhealthy. It has a good trade in grain and cattle. The only building worthy of note is its cathedral, of Gothic architecture. It possesses a communal college, and is the seat of a bishop. It was to this see the celebrated Cardinal Richelieu was elevated at the age of twenty-two. The Republicans sustained a defeat under the walls of Luçon in 1793; and the insurgent Vendéans besieged the place some months afterwards, but without success.

LUCRETIA, the famous Roman matron, wife of Collatinus, and the cause of the revolution in Rome by which the constitution of the state was changed from a monarchy to a republic. This lady being ravished by Sextus, the eldest son of Tarquin, King of Rome, stabbed herself, in the year 509 B.C. The bloody poniard, with her dead body exposed to the senate, was the signal of Roman liberty; the expulsion of the Tarquins, and the abolition of the regal dignity, were instantly resolved on, and carried into execution.

LUCRETIUS, a celebrated Roman poet and philosopher. Of the life of Titus Lucretius Carus (as his full name is written) very little is known. As he styles the Latin language his mother tongue, we infer that he was a Roman, or at least an Italian. According to the Eusebian chronicle (almost the sole authority on the subject), he was born in 95 B.C., and died by his own hand in 52 B.C.; and his poem *De Rerum Natura*, which had been written during the intervals of a frenzy caused by a love-potion, was afterwards edited by Cicero. The account of his madness is rendered doubtful by the internal evidence of his work. In no poem do we see more distinct traces of the various human faculties acting harmoniously under the sovereignty of reason. There is no distinct evidence of Cicero's having edited the poem of Lucretius. The story about his suicide is much more probable. His opinions touching the mortality of the soul, his fearless Roman spirit, and his stern decision of character, might possibly enough urge him to adopt this mode of ridding himself of any dire calamity.

His poem *De Rerum Natura* consists of six books, and is dedicated to his friend, C. Memmius Gemellus, who was prætor in 58 B.C. Lucretius evidently received the first obscure hints of his system from Empedocles; but raised it into symmetry and consistence by aid of the atomic philosophy of Epicurus. Starting from the axiom that *nothing can be produced from nothing*, and holding that the laws of nature, and not the gods, are the creative principles of the universe, he attempts to prove that all things are formed by the combinations of indivisible and eternal atoms. After describing the different spontaneous motions by which these primary particles come to be combined into sensible qualities, Lucretius passes on in the third book to trace the soul of man to the same origin. From this conclusion, he advances easily to the doctrine that the soul is material, and must therefore perish when life, the band that unites it with the body, is snapt asunder. In the fourth book he expounds his theory of the senses, of sleep, and of dreams. The fifth book is occupied with disquisitions on the origin of the world, on the movements of the stars, on the laws that regulate the seasons, and the interchange of day and night, and on the gradual development of civilization. In the sixth book he endeavours to account for physical phenomena, such as thunder, rain, earthquakes, volcanoes, and pestilences. The abruptness of the conclusion, a feature not seen in the rest of the work, renders it very probable that Lucretius left his poem unfinished.

As the body of the system is Epicurean, so also is the

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Lucretius.

Lucullus. spirit which animates it. A philosophy that recognises natural laws as the source of creation, is of necessity pervaded by a deep reverence for nature. Standing, therefore, in the same relations to Lucretius as the muse and the gods did to Homer and the other ancient poets, nature is invoked at the very commencement of the poem, and the manifold manifestations of her power furnish the themes of the poet's noblest strains. Her ever-varying moods, too mysterious to require poetical idealizing, are depicted with minute faithfulness, and are lingered over with devotion. The poet beholds her sunshine, beauty, and beneficence, with gladness; her tempests, famines, earthquakes, and pestilences, with sublime wonder. Mankind, as the noblest part of nature, attract the special interest of Lucretius. Their joys and sorrows are the themes of some of the most exquisite episodes in his poem; and the professed object of his philosophy is to release them from superstitious fears. Accordingly, he tells them that there is no after-time of retribution; and that the gods, whose anger they fear, dwell too far above this sphere, and are too listlessly happy, to regard the sins and exact the services of the human race. He recommends, as the aim of life, that quiet of the soul which is attained by the suppression of all fears and vicious passions. This lesson is enforced by the very shortness of the time in which the end must be gained.

In Lucretius we see the harmonious working of the two great powers of imagination and reason—the former describing conclusions while yet at a distance, and the latter searching for a path by which they may safely be reached. Often misled by the careless induction peculiar to antiquity, his reasonings are nevertheless founded on a minute and extensive observation. The most striking feature, however, in the entire poem, is the vigour with which the closest arguments and the subtlest abstractions find poetical expression in a language formerly rude and undeveloped. Scarcely less wonderful is the full melody of his hexameters. The fervid genius of Lucretius acted with a refining vehemence upon the rugged ore of his native tongue, purged it of its dross, and fused it into the golden speech of poetry. Many of his epithets are terse and felicitous, and his images possess that suggestive power which it is the sole prerogative of poetic genius to originate. He possesses, also, the happy art of relieving the sterner and darker pictures of his poem by sweet glimpses of sea-shore and rural solitude.

The best editions of Lucretius are those of Lambinus, Paris, 1564–70; Creech, Oxford, 1695; Wakefield, London, 1796–97; Eichstädt, Leipsic, 1801; and Forbiger, Leipsic, 1828. The latest English translation is that of the Rev. John Selby Watson, published along with a metrical version by Mason Good, London, 1852. See “Lucretius and the Poetic Characteristics of his Age,” by W. Y. Sellar, in *Oxford Essays*, London, 1855.

LUCULLUS, **LUCIUS LICINIUS**, the conqueror of Mithridates, was born probably about 109 B.C. At an early age he distinguished himself so much in the social war, that Sulla gave him the command of a fleet during the first war with Mithridates, and appointed him quaestor of Asia. After discharging this office with great prudence, he returned to Rome in 80 B.C., to fill the curule ædileship, and in the following year he was appointed praetor. No sooner had he been elected consul in 74 B.C., than the second Mithridatic war broke out, and Lucullus hastened into Asia to attack the enemy. His first exploit was the relieving of his colleague, Cotta, who, after suffering defeat both by land and sea, had been shut up in Chalcedon. Attacking the enemy successively at Rhyndacus, the *Æsepus*, and the Granicus, Lucullus in a short time annihilated the land forces of Mithridates. He mustered a fleet with equal celerity, and routed the squadron of the king near the island of Lemnos. Mithridates had, meanwhile, retreated

into his native kingdom, and thither Lucullus now marched. After baffling the pursuit of the Romans for some time, the king was forced, in 72 B.C., to flee to his son-in-law, Tigranes, Prince of Armenia. To this country accordingly, the war was transferred in 69 B.C., and the defeat of the Armenian forces before the walls of their capital, Tigranocerta, was followed soon after by the fall and pillaging of that city. In 68 B.C., Mithridates and Tigranes had consolidated their shattered armies, and met Lucullus at the River Arsanias, but were again defeated and forced to flee ignominiously. Other successes would have followed, had not a spirit of disaffection in the minds of the soldiers, that was due partly to the reserved disposition of Lucullus, and partly to the machinations of his enemies at Rome, now broken out into open mutiny. After struggling with it ineffectually, and seeing Mithridates recover Pontus and Cappadocia, Lucullus, in 66 B.C., was superseded in the command by his old rival Pompey. On returning to Rome, his well-earned triumph was delayed for three years, through the intrigues of his enemies. He then passed into private life to enjoy the immense wealth he had amassed in the East, and he soon became as noted for his luxurious indolence as he had been for his military activity. He laid out extensive gardens in the suburbs of Rome, and built two magnificent villas, the one near Neapolis, and the other at Tusculum. A student and a lover of the fine arts from his earliest years, he now passed much of his time in collecting an extensive library, in decorating his mansions with costly paintings and statues, and in conversing with the learned men whom he loved to gather round him. Cicero was his intimate friend, and in the *Academics* praises his learning very highly. Shortly before his death, which happened at some time previous to 56 B.C., Lucullus is said to have fallen into a state of dotage. He was the first to introduce cherries into Europe.

LUCULLUS, *Marcus Licinius*, a younger brother of the preceding, was also called M. Terentius Varro Lucullus, on account of his adoption by M. Terentius Varro. Under Sulla he held the office of quaestor, and afterwards of a lieutenant. In 77 B.C. he was appointed praetor, and succeeding his brother as consul in 73 B.C., obtained Macedonia for a province, and there waged a successful war with the Bessi, the Dardanians, and the Greek cities on the Euxine. His exploits were rewarded by a triumph in 71 B.C. In 67 B.C. he was one of the legates appointed to settle the affairs of Pontus, and appears in history as one of the leaders of the aristocratic party in 65 B.C. He died at some period before 49 B.C. M. Lucullus is characterized by Cicero as one of the “lights and ornaments of the republic.”

LUDEHAUNAH. See **LOODIANA**.

LUDLOW, **EDMUND**, son of Sir Henry Ludlow, was born at Maiden-Bradley, in Wilts, in 1620, and educated at Trinity College, Oxford. His father being opposed to the king's interest, Mr Ludlow joined the same party, and was present at the battle of Edgehill, 1642, as a volunteer, under the Earl of Essex. Upon the death of his father, he was chosen knight of the shire for Wilts, and obtained the command of a regiment of horse for the defence of that county. He was one of the judges of Charles I., and after his death was sent by the parliament into Ireland, 1650, in quality of lieutenant-general of the horse; an employment which he discharged with diligence and success until the death of the lord-deputy, Ireton, when he acted for some time as general, though without that title. Cromwell, who knew him to be sincerely in the interest of the commonwealth, had nevertheless not sufficient confidence in Ludlow to warrant him in elevating him formally to the generalship. When Cromwell assumed the protectorate, Ludlow gave in his “solid” protest against that step, and he even refused, on leaving Ireland, to yield the Protector

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Ludlow.

Ludlow
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Ludolphus.

an unqualified submission. He sought retirement in Essex until Oliver's death, when he used his efforts to restore the commonwealth; but Charles II. being recalled, he thought proper to conceal himself, and escaped into Switzerland, where he settled in 1660, in the neighbourhood of the town of Vevay, where more than one English refugee have found a home and a grave. After the Revolution he came over to England, 1689; but having appeared publicly in London, it gave great offence, and an address was presented by Sir Edward Seymour to King William III., praying for a proclamation in order to apprehend Colonel Ludlow, attainted for the murder of King Charles I. Upon this he returned to Switzerland, where he died in 1693, aged seventy-three years. Over the doorway of his house he placed the inscription, *Omne solum forti patria*. His grave is still shown at Vevay. His *Memoirs* were written during his retirement in Switzerland, and published at Vevay, in two volumes, in 1698, which were followed by a third volume during the next year.

LUDLOW, a parliamentary and municipal borough and market-town of England, Shropshire, on the left bank of the Teme at its junction with the Corve, 36 miles W. by S. of Birmingham. It stands on a gentle acclivity, and is overlooked by an old castle, situate on a wooded eminence. The streets are spacious, the houses well built, and the town is well supplied with water. It contains a parish church, a cruciform edifice in the perpendicular style, erected in the beginning of the fourteenth century; chapels belonging to the various religious denominations; and several schools, one of which, the Free Grammar School, was founded by Edward VI. Besides these, there are a mechanics' institute, and a natural history society with a good museum. On a bold rock overhanging the river is the old and now ruined fortress of Ludlow, erected in the twelfth century by the lords of Montgomery, for the defence of the English border against the Welsh inroads. It was afterwards frequently honoured by the residence of royalty. The Duke of York held it for some time during the wars of the Roses, until he was forced to give it up in 1459 by the advance of the king's forces against him. Henry VII. made it his residence, and his son held court within its walls. In later times, Prince Charles, afterward Charles I., visited it; and in 1634 Milton's *Comus* was performed for the first time in its hall.

Ludlow is governed by a mayor, 4 aldermen, and 12 councillors, and returns 2 members to parliament. Markets on Monday, Wednesday, and Saturday. Pop. (1851), parliamentary borough, 5376; municipal borough, 4691.

LUDOLPHUS, JOH (or *Leutholf*), a learned writer, was born at Erfurt, in Thuringia, on the 15th June 1624, and received a university education at Leyden, where he devoted his study chiefly to law and oriental languages. He held successively the position of tutor to the sons of the Swedish ambassador at Paris, and to the children of the Duke of Saxe-Gotha at the court of that prince. By the aid of a native of Abyssinia, whom he met at Rome in 1649, while on a literary commission, he mastered the Ethiopic language,—an achievement never before accomplished by any European,—and published in 1661, at London, a dictionary and grammar of that tongue, which he afterwards brought out in a more improved form at Frankfort in 1698 and 1702. His knowledge of languages was exceedingly extensive; and he spared no labour by travel, study, and converse with learned men, to make himself what he ultimately became—one of the most distinguished orientalists of his age. He died at Frankfort-on-Main, on the 8th April 1704.

In addition to those already alluded to, the most important of Ludolph's works are:—*Grammatica Lingua Amharicæ, quæ vernacula est Habessinorum; adjectum est Lexicon Amharico-Lat.*, 2 vols. folio, Franc. 1698; *His-*

Ludwiga-
burg
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Lugdunum.

toria Ethiopica, sive descriptio regni Habessinorum, folio, Franc. 1681; *Ad suum Historiam Ethiopicam Commentarius*, 1691; *Relatio Nova de hodierno Habessinæ statu ex India nuper allata*, 1693; *Appendix continens Dissertationem de Locustis*, 1694; *A New History of Ethiopia*, &c. (an English edition of his *Historia Ethiopica*), folio, London, 1684.

LUDWIGSBURG, a town of Würtemberg, circle of Neckar, about a mile W. of the river of that name, and 8 miles N. of Stuttgart. Ludwigsburg has the character of being one of the handsomest and best laid out towns in Germany. The streets are mostly long, wide, and regular, and are generally lined with rows of trees. This town dates only from the beginning of the last century, at which time the reigning duke, Eberhard Ludwig, had a hunting-seat here. A palace was soon after erected, and from 1727 to 1733 Ludwigsburg was the chief residence of the court. The palace, which is now deserted, is one of the largest in Germany. It has a gallery of old German, Dutch, and Flemish pictures, of no great value. The palace gardens, once famous over Germany, are now falling into disorder from neglect. Ludwigsburg has a military college, lyceum, arsenal, orphan asylum, theatre, &c.; also a cannon foundry, and manufactures of woollen cloth, linen, calico, jewellery, leather, and earthenware. In the neighbourhood are the two royal chateaux of Mouriépos and La Favorite. Pop. about 8000.

LUDWIGSLUST, a market-town of North Germany, grand duchy of Mecklenburg-Schwerin, on the Hamburg and Berlin Railway, 20 miles S. of Schwerin. The principal building is the summer palace of the grand duke, having a gallery of about 200 pictures, some of them good specimens of the Dutch school, and a collection of Slavonic antiquities found chiefly in the duchy. Attached to the palace are a spacious park and garden. The Russian chapel contains the tomb of the Archduchess Helena, Grand Duchess of Russia, who died in 1803. Pop. 5500.

LUGANO, a thriving town of Switzerland, canton of Tessin, on the northern shore of Lugano Lake, 16 miles S. by W. of Bellinzona. It is beautifully situate on the margin of the lake, and is surrounded by a most luxurious country, but the town itself is not well built, and the streets are dirty. The chief public buildings are,—a college, a small theatre, an hospital, founded in the twelfth century, and several schools and churches. Of the latter, the principal are those of San Lorenzo, situate on an eminence, and Santa Maria degli Angeli, founded in 1499, and containing some excellent paintings. Silk grown in the canton is manufactured here extensively, besides tobacco, paper, leather, and copper; and a brisk transport trade is carried on with Italy by means of the lake. Lugano is also the seat of a considerable printing and publishing trade. Pop. 4500.

LUGANO, *Lake of* (*Lacus Ceresius*), a long, narrow sheet of water, lying between Lakes Como and Maggiore, and situate mostly within the Swiss canton of Tessin. It is of a very irregular form, the N.E. portion of it projecting into Lombardy, while from its other extremity a long narrow arm extends northward, forming the boundary between Switzerland and Lombardy. The length of the lake from N.E. to S.W. is about 16 miles, and its average breadth does not exceed 2 miles. It receives numerous tributaries, and discharges its surplus waters by means of the Tresa into Lake Maggiore. The scenery is very striking, the lake being almost surrounded by lofty mountains, overhanging woods, and bold, abrupt precipices. In some parts, however, its banks slope gently to the water's edge, and are covered with villages, gardens, vineyards, &c. Abundance of excellent fish is caught here.

LUGDUNUM (modern *Lyons*), a Roman settlement of Gallia, the capital of the Segusiani, situate at the confluence of the Rhodanus (*Rhone*) and the Arar (*Saône*), is said to

Lugdunum have been colonized, in 43 B.C., by refugees from Vienna (*Vienne*). Its position at the junction of several Roman roads soon rendered it the seat of a thriving commerce, so that in the time of Strabo it was one of the most populous towns in Gaul. It was burnt in the time of Seneca, but was soon afterwards rebuilt by Nero. In 197 A.D. it was burnt again by the soldiers of Septimius Severus. Lugdunum contained the famous *Ara Augusti*, erected in 12 B.C. or 10 B.C., by the sixty Gallic States in honour of Augustus. In the reign of Marcus Aurelius this town was the scene of a fierce persecution of the Christians.

LUGDUNUM BATAVORUM, in *Ancient Geography*, a town of the Batavi, in Gallia Belgica; now *Leyden*, in Holland.

LUGO, a town of Italy, Papal States, delegation of Ferrara, and 32 miles S.S.E. of the town of that name. It is situate in a plain about midway between the Senio and Santerno rivers, and is supposed to occupy the site of *Lucus Diana*. It carries on an important trade, and has a large annual fair, which lasts from the 1st to the 19th of September. Lugo was sacked and nearly destroyed by the French in 1796. Pop. 9500.

LUGO, a province of Spain, one of the four into which the ancient kingdom of Galicia has been divided, is situate on the coast of the Atlantic, between N. Lat. 42. 22. and 43. 47.; W. Long. 6. 52. and 8. 4.; bounded E. by the provinces of Oviedo and Leon, W. by those of Pontevedra and Coruña, S. by the province of Orense, and N. by the sea. It has a coast of about 40 miles in length from Ribadeo to Cape Bares, extremely rugged, and inaccessible to all but fishing boats. Such ports as there are—Ribadeo, Rilo, Foz, San Ciprian—are of small capacity and depth, and obstructed by bars; while the mountains close behind are barren and almost impassable. The province is generally mountainous, especially in the N. and E. The highest summit, that called Rico de Peña Rubia, has an elevation of 6088 feet above sea-level. Inclosed are a great number of fertile valleys; in that of Miranda, on the left bank of the Eo, are cultivated not only the cereals, but also fruit and wine. The valleys of the Oro and Vivera, that called the Riberas del Sor, and that of Monforte, are also very productive. The *partido* of Lugo, the capital, comprehends the delicious valleys of the River Miño and its affluents. The River Miño is the most considerable in the province. It has its rise in the Sierra de Meira, passes the town of Lugo after receiving various smaller streams, and joins the Sil at Los Peares. Sufficient advantage, however, is not taken of the abundant supply of water, and agriculture is in rather a backward state. This is also partly owing to the paucity and badness of the roads, which in this province, as throughout Galicia, are deplorably defective. The productions of the soil are rye, maize, wheat, legumes of various kinds, flax, hemp, and some silk. There is abundance of wood both for building purposes and for fuel. The cultivation of hemp has been almost entirely destroyed by the absurd restrictions of the government. In Caurel and Incio are mines of iron, which is manufactured chiefly in Lugo and Mondoñedo; antimony is found in Castroverde and Cervantes; and argentiferous lead in Riotorto. Among the mineral products of the province may also be reckoned the gold washed down by the streams. There are quarries of granite, marble, various kinds of slate and building stone. Linen and woollen cloths are manufactured to some extent. The export traffic of Ribadeo, Vivero, Santiago, Foz, and San Ciprian, is considerable; but the inland trade, from the causes already mentioned, is insignificant, and carried on chiefly by the maragatos. Education is in a deplorable state. There is a university, so called, at Santiago; but there are very few primary schools, and those are of no great excellence. In the *partido* of Ribadeo there can scarcely be said to be any educational provision whatever. Lugo contains eleven *partidos*, of which the total population

amounted in 1845 to 323,158. The inhabitants of this sequestered region have preserved to a striking degree the manners and customs of ancient Galicia. They are a laborious, loyal, and obedient people; much addicted to litigation, however, and somewhat given to less excusable methods of revenge. The climate of the province is various, on account of the extreme unevenness of its surface; in general it is mild, however, and especially on the coast.

LUGO, the capital of the above province, is situate in N. Lat. 43. 5., W. Long. 7. 57., on a small hill near the River Miño, about 2118 feet above the level of the sea, 50 miles S.E. from Coruña, and 294 N.W. from Madrid, on the highway between these two cities. Lugo was at one time a city of great importance. Its name is supposed to be connected with its ancient destination as the site of a grove temple. It was the headquarters of the Roman occupation of the region, and was known as *Lucense*, or *Lucus Augusti*. They surrounded the city with a lofty and massive wall, most of which is still standing, and constitutes one of the most remarkable Roman monuments in Spain. It is supported at intervals by strong semicircular towers, which numbered eighty-five previous to the repairs in 1809. It serves at present as a promenade, commanding an extensive and delightful prospect. Lugo suffered greatly in the fifth century during the Moorish wars, and more recently in the war of independence, lying so much in the way of the combatants. The town consists of about 700 houses; it is not compactly built, a good deal of space being taken up with gardens and orchards. The principal public places are,—the Plaza Mayor, a spacious square with porticos on one side; the Plaza de Santo Domingo; the Plaza del Hospital, where reviews are held; and the Campo de San Roque, a place of much resort, where fairs and markets are held.

The most remarkable of the public buildings is the cathedral, situate south of the city, the primitive construction of which dates from the twelfth century, though it has been restored and repaired at various periods, and is still, in some parts, unfinished. The bell-tower and peal of bells, and the carving of the choir, by the famous Galician artist of the sixteenth century, Alonzo Moure, are remarkable. The episcopal palace, the civil hospital, the prison, and the barrack, are the remaining buildings of note. The educational institutions are,—a normal school in the ex-convent of the Dominicans, and a recently established college (*Instituto de Segunda Enseñanza*), which also contains a school of design, museum of natural history, and botanic garden. Attached to this institution is a library of about 7000 volumes, formed of the episcopal library and the books of the suppressed convents. About a mile south of the town, on the left bank of the Miño, are the famous baths of Lugo,—a thermal spring, of sulphurous ingredients, over which in 1847 was erected by the government an excellent and capacious bathing-house. The remains of Roman baths are found here, and the massive wall which they built to defend their erection from the inundations of the Miño still exists almost entire. These baths are resorted to on account of their beneficial influence in paralytic and syphilitic disorders. Pop. (1847) 7269.

LUKE, St, the Evangelist. His Greek name Λουκᾶς is a contraction of Λουκαῖός, *Lucanus*, and indicates that Luke was descended from heathen ancestors, and that he was either a slave or a freedman. Respecting the place and time of his birth we have no certain information. According to ecclesiastical tradition, the author of the Gospel is the same Luke who is mentioned in Paul's epistles (Philem. 24; 2 Tim. iv. 11; Coloss. iv. 14), and who is called, in the last-mentioned passage, "the physician." This tradition is confirmed by the Acts of the Apostles, according to which the author of that work accompanied the apostle Paul in his journeys (Acts xvi. 10, sq.; xx. 5-13; (Acts xxi. 1-17; xxvii. 28). The profession of a physician

Lugo
||
Luke.

Luke. harmonizes also with the condition of a freedman, indicated by the form of the name.

To those who excuse their disbelief of the miracles recorded in the Gospels by the assertion that their authors were ill-informed Jews, greedy of the marvellous, it must appear of some importance to meet in Luke a well-informed Greek, skilled even in the medical sciences. The higher degree of his education is further proved by the classical style in which the proœmium to his Gospel, and the latter portion of the Acts, are written; and also by the explicit and learned details which he gives in the Acts on various antiquarian, historical, and geographical subjects. The classical, connected, periodic, and sustained style of the introduction to the Gospel of St Luke differs so strikingly from the Hellenistic Greek of the history itself, that we clearly perceive that he made use of written documents. He did not, however, transcribe verbatim from them, nor did he merely write down verbal traditions; for we find the same characteristic phraseology which belongs to St Luke's individual style both in the Gospel and in the Acts.

It appears to be doubtful whether Luke had the Gospel of Matthew before his eyes, since in the history of the birth of Jesus he seems to have made use of documents referring to the family of Mary, while the accounts given by Matthew refer more to the family of Joseph. This is also confirmed by the aphoristic mode in which he reports the Sermon on the Mount. The Gospel of St Luke contains exceedingly valuable accounts, not extant in the books of the other evangelists; for instance, those concerning the childhood of Jesus, the admirable parables in chapters xv. and xvi., the narration respecting the disciples at Emmaus, the section from chap. ix. 51 to xix. 27, which contains particulars mostly wanting in the other evangelists.

The statement of Luke at the beginning of his Gospel must dispose us favourably with regard to its historical-credibility. He states that he had accurately investigated the truth of the accounts communicated, and that, following the example of the *πολλοί*, he had made use of the statements of eye-witnesses. Luke had frequent opportunity of meeting these eye-witnesses when he travelled with Paul. He himself reports, in Acts xxi. 18, that he met James. He gives also, with greater accuracy than the other evangelists, some chronological notices, such as those at the beginning of chapters ii. and iii., and in Acts v. 37. As to the statements of the ancients concerning the date or time when the Gospel of St Luke was written, we find in Irenæus (*Adv. Hær.* iii. 1), that Mark and Luke wrote after Matthew. According to Eusebius (*Hist. Eccles.* vi. 28), Origen stated that Luke wrote after Matthew and Mark; but Clemens Alexandrinus, according to the same writer (*Hist. Eccles.* vi. 14), asserted, on the authority of "the tradition of the earlier elders," that the Gospels containing the genealogies were written before the others. Eusebius (*Hist. Eccles.* iii. 24), in reference to the Gospel of John, says:—"John properly passed over in silence the genealogy according to the flesh of our Saviour, which was detailed by Matthew and Luke." De Wette, in his *Introduction to the New Testament*, endeavours to infer from the definiteness with which the destruction of Jerusalem is predicted, &c., that this Gospel was written some time after the destruction of the city had taken place. On this we merely observe that a *petitio principii* runs through the whole train of the argument, since it sets out with assuming the impossibility of detailed predictions. From the circumstance that the book of Acts leaves St Paul a captive, without relating the result of his captivity, most critics have, with considerable probability, inferred that Luke accompanied St Paul to Rome, that he employed his leisure while there in composing the Acts, and that he left off writing before the fate of Paul was decided. Now, since the Gospel of St Luke was written before the Acts, it

seems to follow that it was written a considerable time before the destruction of Jerusalem. The most ancient testimonies in behalf of Luke's Gospel are those of Marcion, at the beginning of the second century, and of Irenæus, in the latter half of that century. A good separate commentary on the Gospel of Luke is still a desideratum. Kuinoel's *Commentarius in Evangelium Lucae* (1843) is not quite satisfactory; nor Bornemann's *Scholia in Lucam* (1830); much less Baumgarten-Crusius (1845).

Besides the Gospel which bears his name, Luke wrote the Acts of the Apostles. In those portions of the Acts in which Luke speaks as the companion of Paul, and consequently as an eye-witness, his Greek style is more classical than in the rest of the work. This circumstance supports the opinion that Luke followed some written documents in the earlier part of the Acts, as well as in the Gospel. Compare Riehm, *De fontibus Act. Apost. Traj.*, 1825; and Kling, *Studien und Kritiken*, 1837, Heft 2.

That the accounts of Luke are authentic may be perceived more especially from a close examination of the inserted discourses and letters. The characteristic marks of authenticity in the oration of the Roman lawyer Tertullus, in ch. xxiv., and in the official letters in ch. xxiii. 26, sq.; xv. 23, sq.; can scarcely be overlooked. The address of Paul to the elders of the Ephesian church is characteristically Pauline, and even so full of definite allusions and of similarity to the Epistle to the Ephesians, that it furnishes a confirmation of the authenticity of that letter which has sometimes been questioned. Respecting these allusions, see an essay of Tholuck in the *Studien und Kritiken*, 1839, p. 306, sq. As for the testimonies in behalf of the authenticity of the Acts, they are the same as for Luke's Gospel. Clemens Alexandrinus, Irenæus, and Tertullian, expressly mention the Acts, and Eusebius reckons them among the Homologoumena. The most complete commentaries on the Acts are those of Kuinoel and Baumgarten; but equally valuable are Neander's *Planting and Training*, Schaff's *Apostolic History*, and Wieseler's *Chronologie der Apostolschen Zeitalter*.

LULLI (or LULLY), GIOVANNI BATTISTA, a musician of celebrity, was born at Florence in 1633. According to the letters of naturalization granted to him in France by Louis XIV., in December 1661, Lulli was the son of a Florentine gentleman, and not of a peasant, as has been so often asserted. In these letters, and in other public documents, his name is spelled Lully, and also in his own signature; but it seems probable that the final letter of his Italian surname became changed in France. He was about twelve years old, and had learned to play on the guitar, when the Chevalier de Guise, then travelling in Italy, happened to see him, and being struck by the lively intelligence of the boy, offered to take him to France, promising to provide for him. Lulli's father being poor, gladly accepted the offer. Mademoiselle de Montpensier, a niece of Louis XIV., had expressed to the chevalier a wish to obtain a pretty Italian boy as a page. Lulli, however, was not pretty, but very dark and coarse-featured; so that when the chevalier presented him to her, the poor boy found no favour in her eyes, but was immediately placed in her kitchen as an under-scellion. He employed his leisure hours in learning the violin, and his extraordinary musical capacity having been remarked, he was made one of mademoiselle's musicians, and soon distinguished himself by his violin playing, as well as by the airs that he composed. But happening to compose an air for some very coarse satirical verses written against his patroness, she was so highly offended that she dismissed him from her music band. Soon afterwards he contrived to obtain admission into the violin band of the king, who, having heard him play in 1652, was so much pleased as to appoint him inspector-general of the royal violin band, and also to institute for

Lulli.

Lully. him a new band of violins called the little band, to distinguish it from the great band of twenty-four violins. Lully wrote a great many pieces for his violin band, and was at that time considered the best violinist in France. Before the French opera was established, the king gave annually grand spectacles called *ballets*, made up of dances, recitations, &c. Lully now commenced the study of musical composition, and wrote the airs for those *ballets* in which the king danced. Forming an intimacy with Molière, Lully composed music for several of that great dramatist's pieces; and from that time continued to compose and direct all the music of Molière's theatre. For several years he acted and danced in the court *ballets*; and at the request of Molière performed with great applause some parts in the latter's comedies. Lully became so great a favourite at court that Louis would listen to no other music but his. In the space of twenty years, Lully, besides receiving numerous presents, obtained nine valuable privileges; and, in 1672, a patent for establishing at Paris a royal academy of music, known afterwards as "The Opera." This was the beginning of Lully's splendid career of fame and fortune. He turned all his powers to the direction and improvement of this new establishment, and composed for it the music of nineteen operas, which remained in vogue for many years. After his death the new opera fell into debt and ruin. Lully led a gay and voluptuous life among the grandees of his time at the French court. It appears that his death was caused by an injury to one of his feet. Having composed a *Te Deum* on the recovery of Louis from sickness, Lully conducted its performance on 8th January 1687, and, while beating the time, accidentally struck his foot with the point of his cane. An abscess ensued, which a bad habit of body rendered fatal. He died at Paris on the 22d March 1687. Some of his biographers represent his conduct and character as in all respects odious. Basely servile to his superiors, brutally insolent to his inferiors, meanly jealous of all other musicians of merit, and unscrupulous in compassing their ruin; a false friend and a tyrannical master; selfish and avaricious in all his dealings; such is the portrait given to us of a spoiled *parvenu* Italian at the court of Louis XIV. But in judging of Lully's career, circumstances of place and time ought to be considered. The blind favouritism of Louis, and the bad example of his courtiers, offered no good school of moral training to the poor Italian boy. Lully married in 1662 Mademoiselle Lambert, who bore him three sons and three daughters. He had a large income from various sources; and after his death the inventory of his effects proved his wealth. His silver plate was valued at 16,707 livres; his jewels, &c., 13,000 livres; his ready money, 250,000 livres; his moveables at the opera, 11,000 livres; and the house itself, 80,000 livres. Besides these, the rents of several houses, 4600 livres a year; and on 3d April 1687, his widow sold his place of royal secretary for 71,000 livres: a wonderful contrast to the condition of Lully when he was under-sculion in the kitchen of Mademoiselle de Montpensier! Although there was nothing peculiarly original in the style and form of Lully's music, he possessed a feeling for dramatic expression which caused his operas to survive so long in France after his death. The last performance of one of his operas was in 1778; and in the same year three of Gluck's operas, with some of Piccini's and Paisiello's, were performed. These new and original works, in a style so different from Lully's, produced a great effect on the Parisians; and thenceforward Lully's operas were no more heard. Nineteen of Lully's operas were published in score; and his portrait is prefixed to his opera of *Acis et Galatée*. (G. F. G.)

LULLY, RAYMOND, surnamed the "Enlightened Doctor," a philosopher and theologian of eccentric character and singular enthusiasm, was born at Palma, in the island of Majorca, about 1235. In early life he espoused the pro-

fession of arms under James I. of Arragon, at whose gay Lunawara court he is said to have led a somewhat irregular life. His mind took a serious turn about the age of 30, when he retired to a desert, and, amid solitude and asceticism, gave himself up for nine years to the study of theology, to prepare himself for the duties of a missionary. Directed, as he alleged, by a vision from Christ to convert the Mohammedans, he learned Arabic from a slave; and it was on becoming acquainted with the philosophy of Averroës that he probably conceived his scheme of dialectics, by which he hoped at once to revolutionize science and the world. His *Ars Lullia* was now published (1276), at the express command of a fiery seraph which appeared to him; and having prevailed upon his former patron of Arragon to establish a convent at Palma for the education of missionaries to the infidels, he went to Rome ten years afterwards to solicit the aid of Pope Honorius IV. in carrying out a crusade against the worshippers of Islam. The death of his holiness compelled Lully to look for aid elsewhere, and he accordingly visited Paris and Genoa, but without success. Having crossed to Africa, he engaged in a discussion with a Mohammedan, which almost cost him his life. He left the country for a time; but soon made his appearance again, when he was nearly stoned to death, and afterwards cast into prison. Liberated on the intervention of some Genoese merchants, he returned to Europe, and busied himself in preaching in behalf of a crusade for the recovery of the Holy Land. His success was not equal to his zeal; and the fiery and unquenchable enthusiasm of Lully urged him to make a third single-handed attack upon the unbelievers of Africa, when he died a martyr to his devotion for their conversion, at Bougiah, in Algeria, in 1315, at the mature age of 80 years.

The *Ars Magna* ("Great Art"), as the admiring followers of Lully termed it, consisted in a determination, *a priori*, of all the forms and of all the possible combinations of thought; a complete arsenal of universal argumentation; a reducing of science to a number of general signs; the solution, in short, of all questions, human and divine, by a simple piece of mechanism resembling a calculating machine! His most celebrated follower was the unfortunate Giordano Bruno. Frivolous in many respects as his invention was, it nevertheless was a protest against the idle methods of the schools, which led him to be regarded as a reformer in philosophy. The end Lully had in view was the union—the complete assimilation—of philosophy and theology; and his powers neither as a philosopher nor as a theologian were able to free him from the inextricable confusion into which his method led him. He united the chivalrous ardour of the crusader to the pedantry of the schoolman; the mystical exaltation of one inspired to the strict and methodical habits of the logician. His personal character claims our admiration for the unconquerable resolution and devoted zeal with which he strove to disseminate what he believed to be the truth. The most complete edition of Lully's works is that of Bucholius and Salzinger, 10 vols. folio, Mayence, 1721.

LUNAWARA, a town of Hindustan, in the province of Gujerat, and district of the Rewa Caunta, situate near the confluence of the Panum with the Myhee River. It is the capital of a native principality of the same name. Here, in 1803, a treaty was concluded with the rajah by the British government, which freed him from the tribute he had before paid to Scindia. Sir George Barlow, in 1806, severed the connection, whereupon the territory again became subject to Scindia, who revived his demand of tribute. In 1819 the right of supremacy over Lunawara was ceded by Scindia to the British government; the latter guaranteeing the payment of the tribute on condition that Scindia should forthwith withdraw from the state, and refrain from further interference in its affairs. The town is situate in

Lund

Lunel.

N. Lat. 23. 8., E. Long. 73. 37. It is 65 miles E.N.E. from Ahmedabad.

LUND, a town of South Sweden, situate in an extensive plain in the laen of Malmö, 8 miles from the Sound, and 24 miles E. from Copenhagen. The town is of high antiquity, and in pagan times is said to have had a population of 80,000. It is now chiefly remarkable for its university, founded by Christian I. of Denmark in 1479. It has faculties of philosophy, law, medicine, and theology, and is attended by about 600 students. The library contains upwards of 70,000 vols. and about 2000 MSS. There are also collections of natural history, coins, antiquities, &c. Puffendorff was professor of the law of nature and nations here; and Linnaeus was for some time a pupil. The present building was erected in 1666. The cathedral is a large irregular structure, said to have been founded about the eleventh or twelfth century, but since then has been frequently altered. Lund, at present the seat of a bishop, was in the middle ages the seat of an archbishop, who was considered the primate of the north. On a hill about half a mile from the town, the Scandinavian monarchs were elected sovereigns of Scania. The chief manufactures of the town are woollen cloth, leather, and tobacco. Pop. about 5000.

LUNDY ISLAND, a small precipitous island lying off the N. coast of Devonshire, in the Bristol Channel, opposite Bideford Bay, and about 9 miles N.W. of Hartland Head. It is $2\frac{1}{2}$ miles in length from N. to S., by $1\frac{1}{2}$ in width, and contains an area of 920 acres. It consists almost entirely of granite, which rises in lofty cliffs from the sea, affording only one narrow landing-place on the S.E. side, near Rat Island. Here, however, there is a safe anchorage in from 5 to 12 fathoms of water. The land is laid out in pasturage, and swarms with rabbits; while the rocks are inhabited by vast numbers of sea-fowl, especially puffins. This island was originally held by a pirate, named Morisco, in the beginning of the thirteenth century, who erected a fortress on it, which was afterwards garrisoned by Lord Say for Charles I. A lighthouse, with an intermittent and fixed light, stands on the southern extremity, near the ruins of St Anne's chapel. Pop. (1851) 34, chiefly employed in shooting rabbits and sea-fowl for the skins and feathers.

LÜNEBURG, a town of Hanover, capital of a province of the same name, on the left bank of the Ilmenau, and on the Hamburg and Hanover Railway, 82 miles N.N.E. of the latter. It is surrounded by old walls, having six gates, and is a dull, ill-built town, the streets being narrow and dark, and the houses old-fashioned. The principal public buildings are,—the royal palace, the town-hall, St Michael's church, underneath which are the burial vaults of the old dukes of Lüneburg, St John's church, the exchange, and the cavalry barracks. The academy for the education of young noblemen occupies the old convent of St Michael, and has a museum, and a library of about 15,000 volumes. The River Ilmenau, which falls into the Elbe about 10 miles below the town, is here navigable, and by means of it Lüneburg carries on a considerable trade in the products of the surrounding country. Lime-burning and the making of salt constitute the chief branches of industry, the materials for which are abundant in the neighbourhood. Pop. 12,400. The province of Lüneburg is an immense sandy plain, chiefly covered with heath, moor, and forest, mostly of fir. Along the banks of the rivers, particularly the Aller and Elbe, occur some fertile land. Flax is cultivated; but the quantity of corn produced is not sufficient for the wants of the people. The breeding of cattle is much attended to, and sheep are very numerous. Many of the inhabitants derive a great portion of their subsistence from the keeping of bees. Area 4326. Pop. (1852) 338,764, almost all Lutherans.

LUNEL, a town of South France, department of Hérault, near the right bank of the Vidourle, and on the canal which terminates in the Mauguio lagoon, 16 miles S.W. of Nîmes

by railway. It stands on a level plain, which is subject to inundations in the spring, and is very unhealthy in the heat of summer. The only objects of interest are a beautiful fountain, a barrack, and a small botanic garden. In the vicinity a famous kind of sweet wine is made; while, by means of the canal, a brisk trade is carried on in brandy, raisins, grain, and wool. Lunel was formerly strongly fortified, and was several times besieged in the Huguenot wars. Its defences were afterwards razed by order of Cardinal Richelieu. Pop. (1850) 6392.

LUNETTE, in *Fortification*, a work with two faces and two flanks. It is frequently employed as a form of outwork, designed for the defence of avenues, farm-houses, bridges, the curtains of field-works, &c. (See *FORTIFICATION*.)

LUNÉVILLE, a town of France, capital of an arrondissement in the department of Meurthe, on the right bank of the Meurthe, at its junction with the Vezouze, 20 miles E. by S. of Nancy by railway; N. Lat. 48. 35., E. Long. 6. 29. It is regularly laid out, the streets being generally straight and the houses well built. A palace was built here by the Duke of Lorraine in the beginning of the eighteenth century. It is now a cavalry barrack, with accommodation for 6000 horses, and its gardens have been converted into public promenades. Attached to this barrack, which is the largest of its kind in France, is a riding-school, with an extensive exercising ground. The chief of the other public buildings are,—the parish church, hospitals, college, synagogue, and theatre. The inhabitants manufacture embroidery, delf ware, gloves, and hosiery; and carry on a trade in grain, hops, wine, hemp, and wood, by means of the Paris and Strasbourg Railroad which passes the town. Lunéville, though once a town of some importance, has of late decayed considerably. During the wars between the dukes of Burgundy and Lorraine it was strongly fortified, and sustained numerous sieges. A French army, however, in 1638 entered the town and levelled the fortifications. In the beginning of the eighteenth century it was the residence of Duke Leopold of Lorraine, and afterwards of Stanislaus, ex-King of Poland, both of whom did much to improve the appearance of the town. Pop. (1851) 12,476.

LUPERCALIA, an ancient Roman festival in honour of Lupercus, the god of fertility, seems, from its rude and uncouth ceremonies, to have been introduced by shepherds at a very early date. On the 15th of February, the day of the festival, the Luperci, or priests of Lupercus, assembled at the Lupercal, the spot where the she-wolf is supposed to have suckled Romulus and Remus. There they sacrificed goats and young dogs—animals supposed to be acceptable to the god of fertility, on account of the strength of their sexual appetite. Two youths of noble birth were then led forward; their brows were first stroked by a sword dipped in the blood of the victims, and afterwards washed with wool saturated in milk. The young men meanwhile laughed as often as they were touched. After feasting plentifully, the Luperci cut into shreds the skins of the goats that had been sacrificed. With some of these pieces they covered part of their body, leaving the rest naked, in imitation of Lupercus. With others shaped into thongs, they ran wildly through the streets, lashing every one they met. To these lashes women often submitted voluntarily, since they believed them a preventive against barrenness and severe pangs in child-bearing. That the ceremonies of the Lupercalia were originally intended to symbolize the purification of the people, is evident from the fact that Lupercus was styled, *Februus*; his festival day, *dies februata*; the month in which that day occurred, *februarius*; and the goat-skin used, *februum*. In course of time, however, the festival came to be regarded simply as a relic of antiquity, and as such continued to be observed as late as the reign of Anastasius. It seems to have been also celebrated in other towns of Italy and in Gaul.

Lunette
Lupercalia

Lurgan
||
Lustration.

The Luperci were originally chosen from the patricians, and are supposed to have been instituted by Romulus and Remus. These princes divided the order or college into two classes; and after the names of their own respective followers, styled them Quinctiliani, or Quinctilii, and Fabiani, or Fabii. A third class, called Julii, was added by Julius Cæsar; and to these, and possibly to the other divisions also, he assigned certain revenues, which were afterwards discontinued. The office of the Luperci was not a life appointment, but how long it continued is unknown.

LURGAN, a market-town of Ireland, county of Armagh, on the Belfast and Armagh high road, 21 miles W.S.W. of the former, and 2 miles from the southern shore of Lough Neagh. It stands on a gentle eminence, and commands an extensive view of the neighbouring country and lake. The town chiefly consists of a wide, well-built street, and contains a handsome parish church, with chapels belonging to the Roman Catholics, Presbyterians, and others. There are also several schools, a court-house, bridewell, linen-hall, and market-house. The manufactures comprise linens, especially damasks and diapers, tobacco, beer, and whisky. Lurgan was founded in 1619 by the Brownlow family; but in 1641 it was burned to the ground, and although afterwards rebuilt, was again destroyed by the army of James II. It was, however, laid out anew, and soon became a thriving manufacturing town. Market-day, Thursday. Pop. (1841) 4677, (1851) 4211.

LUSATIA (German *Lausitz*), was anciently a margraviate of Germany, lying between Brandenburg, Sillesia, Bohemia, and Saxony, and having an area of about 4200 square miles. It was instituted in 931, but after various changes was annexed to Bohemia in 1370. In 1635 it was ceded by Ferdinand II. to the electorate of Saxony. By decision of the Congress of Vienna, in 1815, Saxony was obliged to cede the whole of Lower, and also a portion of Upper Lusatia to Prussia. The remainder of Upper Lusatia now forms the Saxon province of Bautzen.

LUSITANIA, a district of ancient Hispania. Considered in its original meaning as the country of the Lusitani, it is said by Strabo to have been bounded on the S. by the Tagus, and on the W. and N. by the sea. In the course of time, however, the growing importance of the Callaici on the N. narrowed its extent, and fixed the River Durius (*Douro*) as its northern boundary. Again, in consequence of the multitude of Lusitanians that were driven southward during their protracted struggle with the Romans, the name Lusitania was gradually extended to those districts S. of the Tagus. Accordingly, when fixed by Augustus as one of the three provinces of Hispania, Lusitania was comprised between the Anas (*Guadiana*) on the E., the sea on the S. and W., and the Durius on the N. The chief river within the district is the Tagus, which flows westward into the Atlantic Ocean. The following are the principal towns on the rivers:—On the Anas, Metellinum (*Medellin*), Emerita Augusta (*Merida*), the Roman capital Pax Augusta (*Badajoz*), and Myrtilis (*Mertola*); on the Tagus, Libora (*Talavera de la Reina*), Norba Casarca (*Alicantara*), Scalabis (*Santarem*), and Olisipo (*Lisbon*), the ancient capital previous to the time of the Romans; and on the Munda (*Mondego*), Conimbriga (*Coimbra*). The other towns are,—Salmantica (*Salamanca*), Sancia Transcudana (*Ciudad Rodrigo*), Ebora (*Evora*), and Pax Julia (*Beja*). The Lusitanians, especially those that inhabited the mountains, were much addicted to plunder. Of all the Iberians, they were the bravest, and offered most resistance to the Romans.

LUSTRATION, in *Antiquity*, sacrifices or ceremonies by which the ancients purified their cities, fields, armies, or people, defiled by any crime or impurity. Some of these lustrations were public, and others private. There were several ways of performing lustration, viz., by fire, by sul-

phur, by water, and by air; the last being done by fanning and agitating the air round the thing to be purified. Some of these lustrations were necessary, and could not be dispensed with, as lustrations of houses in time of a plague, or upon the death of any person; others, again, were performed from choice, and at pleasure. The most of the Roman lustrations were not intended to atone for crime, but to secure the blessings of the gods. The public lustrations at Rome were celebrated every fifth year, in which they led a victim thrice round the place to be purified, and in the meantime burned a great quantity of perfumes. The country lustrations were celebrated when sowing was finished, and before the peasants began to reap the corn; in those of the armies, called *armilustria*, some chosen soldiers, crowned with laurel, led the victims—a cow, a sheep, and a bull—thrice round the army ranged in battle-array in the field of Mars, to which deity the victims were subsequently sacrificed, after pouring out many imprecations upon the enemies of the Romans. The lustrations of the flocks were designed to preserve the flock from disease, contagion, &c., and were performed in this manner:—The shepherd sprinkled them with pure water, thrice surrounded his sheepfold with a composition of savin, laurel, and brimstone set on fire, and afterwards sacrificed to the goddess Pales an offering of boiled milk, wine, a cake, and millet. As for private houses, they were lustrated with water, a fumigation of laurel, juniper, olive tree, savin, and the like; and the victim was commonly a pig. Lustrations made for particular persons were commonly called *expiations*, and the victims *piaculu*. There were also for infants a kind of lustration by which they were purified,—girls on the third, and boys on the ninth day after their birth; a ceremony which was performed with pure water and spittle. They cast into the river, or at least out of the city, the animals or other things which had served for a lustration or sacrifice of atonement; and thought themselves threatened with some great misfortune when by chance they trod upon them. Part of these ceremonies were abolished by the Emperor Constantine and his successors; the rest subsisted till the Gothic kings became masters of Rome, when they expired. (See Hartung, *Die Religion der Römer*.)

LUSTRUM, was a lustration or purification of the Roman people, by one of the censors in the Campus Martius, after the census, which was taken every five years, had been completed. This custom was first instituted by King Servius Tullius B.C. 566, and was afterwards kept up with great regularity at the periods just specified. In the earliest period of the Roman republic the census was taken, and the lustrum solemnized, not by the censors, as was afterwards the custom, but by the consuls. We gather from Livy (iii. 22, xxiv. 43), that the census sometimes took place without the lustrum being performed, owing probably to some great calamity which had happened to the republic. For the determination of the time when the lustrum took place, see Niebuhr, *Hist. of Rome*, i., p. 277.

LUTE, a substance used for making vessels or apparatus air-tight, by closing the apertures of their joints, or for coating, so as to enable them to bear a higher temperature, or for repairing a fracture. Clay is the basis of many lutes; whence the term from *lutum*, clay. Among the principal lutes are *Stourbridge clay*, in fine powder, made into a paste with water; *Windsor loam*, a natural mixture of clay and sand; *Willis's lute*, a thin paste made of a solution of borax in boiling water, with slaked lime. Mixtures of borax and clay also form useful lutes. What is called *fat lute*, is a mixture of pipe-clay with drying linseed-oil. Caustic lime, furnishes, by admixture with other bodies, a variety of lutes. A mixture of lime and white of egg, or glue, forms a powerful cement. *Iron cement* (described under GAS-LIGHT) is useful for making joints tight, as is also white-lead, ground

Lustrum
||
Lute.

Lute
||
Luther.

up with oil and spread on strips of cloth. Among the other substances used as lutes, may be mentioned moistened bladder, paste and paper, paper prepared with a mixture of wax and turpentine, linseed-meal, and caoutchouc. The last-named substance is in extensive use for making chemical joints or elastic connectors, getting rid of that rigidity which in a complicated arrangement of apparatus is so liable to lead to accident. (C. T.)

LUTE, a stringed instrument of music, long since superseded by the harp and the guitar, but for centuries very fashionable in Europe. The music for the lute was written

in tablature. Any person who wishes to become acquainted with the nature of the lute and its mysteries of stringing, tuning, notation, and playing, may consult Thomas Mace's *Musick's Monument*, published at London in 1676. Most of the MS. lute music in tablature is so carelessly and incorrectly written, as to offer serious difficulties to any person who would translate it into modern notation. The writer of this article may refer to the *facsimile* extracts which he made from Gordon of Straloch's *Lute Book*, and from Dr Leyden's *Lyra-Viol Book*, and presented to the Library of the Faculty of Advocates, Edinburgh, in 1847. (G. F. G.)

Luther.

L U T H E R.

LUTHER's life is both the epos and the tragedy of his age. It is an epos because its first part presents a hero and a prophet, who conquers apparently insuperable difficulties, and opens a new world to the human mind, without any power but that of divine truth and deep conviction, or any authority but that inherent in sincerity and undaunted, unselfish courage. But Luther's life is also a tragedy: it is the tragedy of Germany as well as of the hero, her son, who in vain tried to rescue his country from unholy oppression, and to regenerate her from within, as a nation, by means of the gospel; and who died in unshaken faith in Christ and in his kingdom, although he lived to see his beloved fatherland going to destruction, not through, but in spite of, the Reformation.

Both parts of Luther's life are of the highest interest. In the epic part of it we see the most arduous work of the time,—the work for 200 years tried in vain by councils and by prophets and martyrs, with and without emperors, kings, and princes,—undertaken by a poor monk alone, who carried it out under the ban both of the pope and the empire. In the second, we see him surrounded by friends and disciples, always the spiritual head of his nation, and the revered adviser of princes and preacher of the people; living in the same poverty as before, and leaving his descendants as unprovided for as Aristides left his daughter. So lived and died the greatest hero of Christendom since the apostles; the restorer of that form of Christianity which now sustains Europe, and (with all its defects) regenerating and purifying the whole human race; the founder of the modern German language and literature; the first speaker and debater of his country; and, at the same time, the first writer in prose and verse of his age.

And in what state had he found his native country? The once free and powerful aggregate of nations, which had overthrown the western empire, conquered Gaul, and transfused healthier blood into the Romanized Celtic population of Britain, had gradually been broken up into nearly 400 (with the barons of the empire, 1200) sovereignties, under a powerless imperial government represented by emperors bent upon the destruction of nationality, and by an oligarchic diet with seven electoral princes at its head, three of whom, as ecclesiastics, were creatures of the pope, while the remaining four, imitating the emperor, were occupied rather with the selfish interests of their princely Houses than with those of their country. When, in 1486, Maximilian was to be elected king of the Romans, and when he became emperor (in 1493), Archbishop Berthold, elector of Mayence, a great and patriotic man, had prepared, with some other German princes, a plan for a sort of national executive, the members of which were not to be installed, as heretofore, by the emperor alone, but appointed by the Diet and the electors, in order to form a federal senate to co-operate with the emperor. But the Austrian prince, son-in-law of Charles of Burgundy, and heir to his kingly estates, was liberal in promises unfulfilled, having lived not only to maintain but to strengthen the im-

perial autocracy. His great comfort on his death-bed was the reflection that his whole life had been devoted to the aggrandizement of his own House of Austria. The smaller German lords and knights of the empire made a last attempt to maintain their independence, and to restore the ancient liberties of the German nation; but acting in a lawless manner and without any political wisdom, they were crushed by the united power of the emperor and the electors. The more eminent and powerful portion of the mass of the nation was represented by the wealthy towns, which had purchased from the emperors the privileges of free imperial cities; and which, with the Hanseatic towns, would have formed, united with the estate of the knights, the most complete constituent parts of a House of Commons, by the side of the princes, dukes, and counts of the empire as House of Peers. The formation of such an effective federal empire must have been in the mind of those enlightened men, who, at the election of Maximilian, perceived that a constitution was necessary to prevent Germany from becoming a mere domain of the emperors. A truly representative government, federal and unitary, monarchical and aristocratical and popular, would have followed, as a matter of course, from such a beginning as that proposed. But since the failure of that plan nothing effectual had been accomplished; isolation and separation became more complete; the peace of the land was enforced at last, although imperfectly; and the imperial tribunal established by Maximilian acted with insufficient authority, and, as was believed, not with equal justice. The greatest iniquity was the condition of the peasantry. The freeholders had in many parts of Germany been, if not absorbed, at least considerably diminished by the feudal system; but the great grievances were the illegal abuses which had grown out of that system and the always increasing exactions of the lords of the manor, who, particularly in Southern Germany, had reduced the peasants to real serfs,—men who had to render unlimited services and scarcely could support life. There had been insurrections of peasants particularly along the Upper Rhine in 1491 and again in 1503; but being without leaders, they were each time crushed after a bloody struggle, and the ultimate result was a still greater amount of hardship. The chains of the sufferers were riveted. In short, Germany was suffering from all the same evils as France and England without having gained that unity and strength of government which in those countries had resulted from similar struggles. On the other hand, however, the age was one of general progress. The invention of printing had given wings to the human mind; philology had opened the sources of historical knowledge as well as of philosophy and poetry; astrology began to give way to astronomy, and the idea of the universe emerged out of Jewish and other fables. As to Germany in particular, the cradle of the art of printing, Augsburg and other great cities were, with the Hanseatic towns, centres of European commerce, and partook of the resources opened by the discovery of America. The religious mind, too, had been

Luther. awakened since the days of Wycliffe and of Huss. Believing Christendom, and, above all, believing Germany, had hoped for a real reform of the church, the abuses of which were doubly felt in consequence of the shameful immorality of the popes, and the ever-increasing exactions of the court of Rome. The issue of immense efforts on the part of emperors, princes, and people, was, that the council of Constance delivered Huss to the flames, and both the councils of Constance and Basle ended in a more decided supremacy of the Roman pontiffs. Certainly the religious mind of Germany was not a little damped by these disappointments; but the thirst after a reform was not quenched by the evident unwillingness of Rome to reform itself. The wise and good men of the time, however, could not discover any means to achieve what was generally desired and demanded. The faith in human, and gradually also in divine justice upon earth, had long disappeared in unfortunate Italy, as the writings of the age prove; but now it threatened to vanish even in the minds of the Germans, in whom that faith may be called eminently their innate individual and national religion. The Bible had been repeatedly printed in the vernacular tongue, but it was, and continued to be, a book closed with seven seals. There was a general feeling that the gospel ought to be made the foundation of purified religion and doctrine; but where was the man to resuscitate its letter and spirit, and to find the way from Christ to the soul through the darkness and the fictions, the usages and the abuses, of the intervening centuries? The voice of the Friends of God with Tauler at their head had been choked in blood, like that of the Waldenses; and then, supposing such an evangelical basis to have been found, was the existing state of injustice and wrong to continue? Were the emperors to continue to sacrifice the empire to their dynastic interests,—the princes and the nobles to their covetousness and licentiousness? Yes; would not the overthrow of the ecclesiastical power lead to universal conflagration, and rebellion and destruction, and thus Christendom be thrown back into a worse barbarism than that out of which they were anxious to emerge? In short, the work (so it seemed) could not be undertaken but in despair or in enthusiastic faith. In the former case it must succumb necessarily; but even if begun with the faith of Wycliffe and of Huss, would not the attempt in any case lead to a long-continued struggle, the end of which none of those who began it could live to witness? Who should enter on so tremendous a course?

Such was the work to be done, and such were the general and peculiar difficulties and the state of things in Germany, when Luther undertook it. Luther devoted a life of almost supernatural energy and suffering to secure its basis; and although at his death he left it surrounded by the greatest dangers, and one hundred years of bloody struggle were succeeded by another hundred years of agony and of exhaustion, still the Reformation survived, and proved essentially the renovating element of mankind instead of being (as its enemies prophesied) the promoter of revolution. It subsists to this hour as the only durable preserver of all liberties religious or political; and the nations and states which have embraced the Reformation are those only which have escaped the revolutions which for seventy years have agitated those of the Roman faith.

The life of him who was the beginner of this great and holy work, and who broke down the double tyranny of pope and emperor arrayed against him, must therefore be considered from a higher point of view than that of individual biography, or sectarian panegyric, or national vanity and prejudices. The article upon Luther will have to be treated from the central point of the universal history of mankind. This must be also the rule for fixing the epochs of Luther's life. One of the reasons why this life is not yet fully appreciated is, that it is not sufficiently understood;

and this again arises in great measure from the want of due observation of the critical points in the development of the Reformation and of the history of Europe, and of Germany in particular.

We shall divide the following condensed but complete survey into three periods. The first will be the period of preparation, extending to Luther's first publication of theses against the indulgences, 31st October 1517; the second will comprise the next eight years of preaching the gospel and gospel doctrine in its three fundamental parts; the third is that of political and theological struggles, from 1525 to his death in 1546;—preparation, progressive action, and then struggle within and without. Luther's grand character and true piety shine in both periods of his public career; but the culminating point of his active and creative agency is in the first. It is, according to our view, the year 1523 which forms the critical epoch. In 1524 the foundation of the practical realization of the principles of the Reformation was laid with triumphant success. The year 1525 began hopefully, but it ended with the preparation for a struggle, of which Luther felt at once that he never should see the end. Before the close of 1525 he gave up the cause of Germany, not in consequence of any fault committed by himself, but because he saw that his party was not prepared for the struggle with the empire, and was still less resigned to leave the matter to God, who, as Luther firmly believed to his death, would never allow his work to perish till the end of the world. But was not the end of the world coming now?

FIRST PERIOD:—*The Years of Preparation; or, the first Thirty-four Years of Luther's Life*—(1483–1517).

Martin Luther was born at Eisleben, in the county of Mansfeld, in Thuringia, on the 10th November 1483, on the eve of St Martin's Day, in the same year as Raphael, nine years after Michael Angelo, and ten after Copernicus. His father was a miner, descended from a family of poor but free peasants, and possessed forges in Mansfeld, the small profits of which enabled him to send his son to the Latin school of the place. There Martin distinguished himself so much, that his father (by that time become a member of the municipal council) intended him for the study of the law. In the meantime, Martin had often to go about as one of the poor choristers, singing and begging at the doors of charitable people at Magdeburg and at Eisenach, to the colleges of which towns he was successively sent. His remarkable appearance and serious demeanour, his fine tenor voice and musical talent, procured him the attention and afterwards the support and maternal care of a pious matron, wife of Cotta, burgomaster of Eisenach, into whose house he was taken. Already, in his eighteenth year, he surpassed all his fellow-students in knowledge of the Latin classics, and in power of composition and of eloquence. His mind took more and more a deeply religious turn; but it was not till he had been for two years studying at Eisenach that he discovered an entire Bible, having until then only known the ecclesiastical extracts from the sacred volume, and the history of Hannah and Samuel. He now determined to study Greek and Hebrew, the two original languages of the Bible. A dangerous illness brought him within the near prospect of death; but he recovered, and prosecuted his study of philosophy and law, and tried hard to gain inward peace by a pious life and the greatest strictness in all external observances. His natural cheerfulness disappeared; and after experiencing the shock of the death of one of his friends by assassination in the summer of 1505, and soon after that, being startled by a thunderbolt striking the earth by his side, he determined to give up the world and retire into the convent of the Augustinians at Erfurt—

Luther. much against the wishes and advice of his father, who, indeed, most strongly remonstrated. Luther soon experienced the uselessness of monastic life and discipline, and suffered from the coarseness of his brethren, who felt his exercises of study and meditation to be a reproach upon their own habits of gossiping and mendicancy. It was at this period that he began to study the Old Testament in Hebrew, yet continuing to fulfil scrupulously the rules of his order. "I tormented myself to death," he said at a later period, "to make my peace with God, but I was in darkness and found it not." The vicar-general of the order, Johann Von Staupitz, who had passed through the same discipline with the same result, comforted him by those remarkable words, which remained for ever engraven in Luther's heart:—"There is no true repentance but that which begins with the love of righteousness and of God. Love him then who has loved thee first!" In the struggles which followed Luther's real beginning of a new life, and in the perplexities into which Augustin's doctrine of election threw him, the book which, after the Bible, exercised the greatest and most beneficial influence upon his mind was that practical concentration of the sermons and other works of Tauler—the enlightened Dominican preacher and Christian philosopher of the middle of the fourteenth century—the *Theologia Germanica*, written by an anonymous author towards the latter part of that century, of which we shall have to speak hereafter.

When Luther regained his mental health, he took courage to be ordained priest in May 1507. Next year the Elector of Saxony nominated him professor of philosophy at the university of Wittemberg; and in 1509 he began to give, as bachelor in divinity, biblical lectures. These lectures were the awakening cause of new life in the university, and soon a great number of students from all parts of Germany gathered round Luther. Even professors came to attend his lectures and hear his preaching. The year 1511 brought an apparent interruption, but in fact only a new development of Luther's character and knowledge of the world. He was sent by his order to Rome on account of some discrepancies of opinion as to its government. His first impression of the city was that of profound admiration, soon mixed with a melancholy recollection of Scipio's Homeric exclamation on the ruins of Carthage. The tone of flippant impiety at the court and among the higher clergy of Rome, under Julius II., shocked the devout German monk. He then discovered the real state of the world in the centre of the western church; and often in after life he used to say—"I would not take 100,000 florins not to have seen Rome." Always anxious to learn, he took during his stay Hebrew lessons from a celebrated rabbi, Elias Levita; but the grand effect upon him was, that now for the first time he understood Christ and St Paul—"The just shall live by faith"—that mighty saying with which he had begun at Wittemberg his interpretation of the Bible, now sounded on his ears in the midst of Rome. He saw that external works are nothing; that the pious spirit in which any work is done or any duty fulfilled,—an humble handicraft or the preaching of sermons,—is the only thing of value in the eye of God. On his return to the university, the favour of Staupitz and the generosity of the elector procured him a present of fifty florins (ducats) to defray the expenses of his promotion to the degree of Doctor of Divinity at the end of 1512. The solemn oath he had to pronounce on that occasion (to most only a formulary without deep meaning) "to devote his whole life to study, and faithfully to expound and defend the holy Scripture," was to him the seal of his mission. He began his biblical teaching by attacking scholasticism, which at that time was called Aristotelianism. He showed that the Bible was a deeper philosophy: that, teaching the nothingness and wickedness of man as long as he is a selfish creature, it refutes and condemns all philosophical

tenets which consider man separately from his relation to Deity. All his contemporaries praised as unparalleled the clearness of his Christian doctrine, the impressive eloquence of his preaching, and the mildness and sanctity of his character. Erasmus himself exclaimed—"There is not an honest divine who does not side with Luther." Christ's self-devoted life and death—Christ crucified, was the centre of his doctrine; God's eternal love to mankind, and the sure triumph of faith, were his texts. Already, in 1516, philosophical tenets deduced from these spiritual principles were publicly defended at academical disputations, over which he presided. Luther himself preached at Dresden and other places the doctrine of justifying and vivifying faith; and then accepted, for a short time, the place of vicar-general of his order in that year. Even in the convents, spiritual, moral Christianity made its way in spite of forms and observances. When the plague came to Wittemberg, he remained when all others fled—"It is my post, and I have to finish my commentary upon the Epistle to the Galatians. Should brother Martin fail, yet the world will not fail."

Thus came the year of the Reformation, 1517. With more boldness than ever, the new pope Leo had sent, in 1516, agents through the world to sell indulgences, and the man chosen for Saxony, Tetzel the Dominican; and his band were among the most zealous preachers of this iniquity. "I would not exchange," said he in one of his harangues, "my privilege (as vender of the papal letters of absolution) against those which St Peter has in heaven; for I have saved more souls by my indulgences than the apostle by his sermons. Whatever crime one may have committed"—naming an outrage upon the person of the Virgin Mary—"let him pay well and he will receive pardon. Likewise the sins which you may be disposed to commit in future, may be atoned for beforehand." But he soon found that a spirit had been awakened among the serious minds of Germany to which such blasphemies were revolting. Luther preached and spoke out against this horrible abuse, which he said he could not believe to be sanctioned by the pope. As a great exhibition of relics, together with indulgences, was to take place on the day of All Saints in the church of Wittemberg, Luther appeared on the eve, 31st October, in the midst of the pilgrims who had flocked to the festival, and posted up at the church door the ninety-five theses against indulgences and the superstitions connected with them, in firm although guarded language. The Reformation began, like that of St John the Baptist, by the preaching of inward penitence, in opposition to penance and to absolution purchasable by gold; but Luther's preaching had the advantage that it was based upon man's redemption by Christ. Penitence was preached, as originating in the consciousness of man's unworthiness, God's mercy, and the redemption through Christ as placed before us in the gospel. The entire doctrine of these immortal Theses is summed up in the two last (94, 95), which run thus:—"The Christians are to be exhorted to make every effort to follow Christ their head through the cross, through death and hell; for it is much better they should through much tribulation enter into the kingdom of heaven, than acquire a carnal security by the consolations of a false peace." A great deed had been done that evening; a door had been opened for mankind into a course whose end is even now far from being reached. Those words—not the result of design and premeditation, but of the irresistible impulse of an honest mind brought face to face with the horrible reality of blasphemy—soon echoed through the whole world. Luther's public life had opened; the Reformation had begun.

SECOND PERIOD:—*The First Part of the Public Life of Luther, or the time of Progressive Action.*

The pilgrims had come to Wittemberg to buy indul-

Luther.

Luther. gences, and returned with the theses of Luther in their hands, and the impression of his powerful evangelical teaching in their hearts. Luther was urged on in his great work not by his friends, who were timid and terrified, but by the violence and frenzy of Tetzel and his adherents, and soon afterwards by the despotic acts of the Pope Leo X., who, having at first despised the affair as a monk's quarrel, thought he could crush it by arbitrary acts. The national mind in Germany had taken up the matter with a moral earnestness which made an impression not only upon the princes, but even upon bishops and monks. Compelled to examine the ancient history of the church, Luther soon discovered the whole tissue of fraud and imposture by which the canon law of the popes—the decretals—had been, from the ninth century downwards, foisted, advisedly and purposely, upon the Christian world. There is not one essential point in the ancient ecclesiastical history bearing upon the question of the invocation of saints, of clerical priesthood, and of episcopal and metropolitan pretensions, which his genius did not discern in its proper light. It is a remarkable fact, and must needs be considered by the philosopher of history as a proof of the spirit of God having guided Luther, that what he saw and said, at the earliest stage of historical criticism, respecting ecclesiastical forgeries and impostures, has all proved true. Soon after Luther, the Centuriatores Magdeburgici, the fathers of criticism as to ecclesiastical history, took the matter up. Of course, the Romanists denied their assertions for 200 years, and wherever they dare, they still come back to the old fables and falsehoods. But the learned discussion has been given up, step by step, reluctantly, and with a very bad grace. Whatever Luther denounced as fraud or abuse from its contradiction to the canonical worship, may be said to have been since openly or tacitly admitted to be such. But what produced the greatest effect at the time were his short popular treatises exegetical and practical. Among these are particularly remarkable his *Interpretation of the Magnificat or the Canticle of the Virgin Mary*, his deep and earnest *Exposition of the Ten Commandments*, and his *Exposition of the Lord's Prayer*, which latter soon found its way into Italy, although without Luther's name, and which has never yet been surpassed, either in genuine Christian thought or in style. Having resolved to preach in person throughout Germany, Luther appeared in the spring of 1518 in Heidelberg, where a general meeting of his Order was held. The count palatine, to whom Luther had been introduced by the elector of Saxony, received him very courteously. In order to rouse the spirit of the professors, he held a public disputation on certain theses, called by him paradoxes, by which he intended to make apparent the contrast of the external view of religion taught by the schoolmen, and the spiritual and energetic view of gospel truth based upon justifying faith. It was here that Bucer, then a Dominican monk, but soon a zealous Reformer and controversialist, and the man who, after Calvin, had among foreigners the greatest influence upon the English Reformation, heard the voice of the gospel in his own heart, and resolved to confess and preach it at the university.

"It is not the pope (said Luther in one of his disputations) who governs the church militant of Christ, but Christ himself; for it is written that 'Christ must reign till he has put all his enemies under his feet.' He evidently has not done so yet. Christ's reign, in this our world, is the reign of faith; we do not see our Head, but we have Him."

On his return to Wittemberg in May 1518, Luther wrote and published an able and moderate exposition of the theses, and sent it to some German bishops. He then proclaimed the absolute necessity of a thorough reformation of the church, which could only be effected, with the aid of God, by an earnest co-operation of the whole of Christendom. But already Rome meditated his excommunication,

uttering threats which he discussed with great courage and equanimity, saying, "God alone can reconcile with himself the fallen soul: He alone can dissolve the union of the soul with himself: blessed the man who dies under an unjust excommunication." In requesting his superior to send his very humble letter to Pope Leo, in which he declared his readiness to defend his cause, Luther added,— "Mark, I do not wish to entangle you in my own perilous affair, the consequences of which I am ready to bear alone. My cause is Christ's and God's." In the meantime, Luther was cited repeatedly to appear before the pope's tribunal at Rome. Leo, indeed, graciously promised to pay the expenses of his journey, which certainly would have been no large outlay, as none would have been required for his return. But Luther constantly declined summonses and invitations, and proposed instead one or other of the German universities as judge. This proposal was, of course, not acceptable to Rome, and therefore he was summoned before the pope's legate in Germany.

The pope's legate was Cardinal Cajetan. Luther was summoned to appear before him at Augsburg, and all princes and cities were threatened with the interdict, if they did not deliver Luther into the hands of the pope's tribunal. It was in these critical circumstances that Luther formed his acquaintance with Melancthon, who soon became his most faithful friend, and remained his zealous adherent for life. When Melancthon and all his other friends advised Luther not to go to Augsburg to be given up to the machinations of the legate, he replied,— "They have already torn my honour and my reputation, let them have my body, if it is the will of God; but my soul they shall not take." He undertook the journey, as a good monk, on foot; only provided with letters of recommendation from the elector, and accompanied by two friends, but without a safe conduct. He arrived at Augsburg on the evening of the 7th October 1518, almost exhausted by the hardships of the journey. The cardinal and his assistants employed in vain alternately threats and blandishments; scholastic arguments fell powerless, as he answered them by the Bible, and demanded to be refuted by the Word of God, to which he showed the decretals to be opposed, and therefore, according even to the declaration of the canonists, of no value. For these reasons he constantly refused to retract, as he was required to do, his two propositions,—the one that the treasure of indulgences is not composed of the merits of Christ; the other, that he who receives the sacrament must have faith in the grace offered to him. Luther left Augsburg after having addressed a firm but respectful letter to the legate; and his friends, who were sure that his life was not safe a moment longer, escorted him before daybreak out of the town on horseback. On his return to Wittemberg, he found the elector in great anxiety of mind, in consequence of an imperious missive of the cardinal legate. Luther wrote to the prince a dignified letter, saying,— "I would, in your place, answer the cardinal as he deserves for insulting an honest man without proving him to be wrong; but I do not wish to be an encumbrance to your highness; I am ready to leave your states, but I will not go to Rome." The elector refused to deliver him up to the legate, or to send him out of the states. Luther would have gone to France if deprived of his asylum in Saxony. The elector, however, having desired him to leave Wittemberg, and Luther being on the point of obeying his orders, the prince, touched by his humility and firmness, allowed him to remain and to prepare himself for a new conference. At the end of 1518, the papal bull concerning indulgences appeared, confirming the old doctrine, without any reference to the late dispute. Luther had already appealed from the pope to a general council.

The years 1519, 1520, 1521, were the time of a fierce but triumphant struggle with the hitherto irresistible power

Luther.
3. At Wittemberg, 1519-1520, he is excommunicated, and burns the pope's bull.

of Rome, soon openly supported by the empire. The two first of these years passed in public conferences and disputations at Leipzig and elsewhere, with Eck and other Romanist doctors, in which Luther was seconded by the eloquence of the ardent and acute Carlstadt, as well as by the learning and argumentative powers of Melancthon. People and princes took more and more part in the dispute, and the controversy widened from day to day. Luther openly declared that Huss was right on a great many points, and had been unjustly condemned. Wittemberg became crowded with students and inquirers, who flocked there from all sides. Luther not only continued his lectures, but wrote during this period his most important expositions and commentaries on the New Testament,—beginning with the Epistle to the Galatians (Sept. 1519), which he used to call his own epistle. During the second year (1520) the first great political crisis occurred, on occasion of the death of Maximilian, and ended fatally, in consequence of the total want of patriotic and political wisdom among the German princes. The elector of Saxony was offered by one of the most eminent and influential of his colleagues, the archbishop of Treves, to be chosen emperor; but had not the courage to accept a dignity which he supposed to require for its support a more powerful house than his own. Of all the political acts which may be designated, with Dante, *ugran vil rifiato*, this was the greatest and most to be regretted, supposing the elector to have been wise and courageous enough to give the knights and cities their proper share in the government, and patriotic enough to make the common good his own.

The German writers have called the Elector Frederic "the Wise," particularly also with regard to this question. But long before Ranke pointed out the political elements then existing for an effective improvement of the miserable German constitution, Justus Möser of Osnabruck had prophetically uttered the real truth,—“if the emperor at that time had destroyed the feudal system, this deed would have been, according to the spirit in which it was done, the grandest or the blackest in the history of the world.” Möser means that if the emperor had embraced the Reformed faith, and placed himself at the head of the lower nobility and the cities, united in one body as the lower house of a German parliament, this act would have saved Germany. But we ought to go further, and say, to expect such a revolution from a Spanish king was simply absurd. Frederic alone could, and probably would, have been led into that course, just because he had nothing to rely upon except the German nation, then more numerous and powerful than it ever has been since. The so-called capitulations of the empire, which were accepted by Charles, contained not the slightest guarantee against religious encroachments on the side of Rome.

Persecutions aimed at the life of Luther began very early. Being one day accosted by a stranger, who concealed a pistol in his sleeve, and asked him, “Why do you walk thus alone?” the intrepid hero answered, “Because I am on the side of God, who is my strength and my shield.” The unknown person turned pale and slunk away. The pope's emissaries in Germany openly demanded the death of Luther. Flattery and threats were used alternately to that end. Luther said, “I do not wish for a cardinal's hat: let them allow the way of salvation to be open to Christians, and I shall be satisfied. All their threats do not frighten me, and all their promises do not seduce me.” When Francis of Sickingen, the most powerful and spirited of the knights of the empire, and the brave and enlightened Ulrich von Hütten and others, offered aid, and said, “force of arms was required to drive out the devil,” Luther answered in those immortal words: “By the Word the world has been conquered; by the Word the church has been saved; by the Word too, she will be restored: I do not despise your offers, but I will not lean upon any one but Christ.”

Luther's writings of this period are the finest productions of his pen. His book *On Good Works* is the best exposition of the doctrine of justification by faith. Melancthon says, in reference to this treatise,—“No writer ever came nearer St Paul than Luther has done.” In the same year (1520) he published that grand address to the nobles of the German nation, *On the Reformation of Christendom*, which may be considered as the finest specimen of the political and patriotic wisdom of a Christian. There he shows the reality and supreme dignity of the universal priesthood of Christians, and at the same time demands a thorough reform of the social system of Germany and Italy, beginning with the abrogation of the usurped power of the pope, while he calls for a national system of education as the foundation of a better order of things. This address, published on the 26th June 1520, electrified the nation. It was this appeal which first moved the patriotic and sainted spirit of Ulrich Zwingli, the Swiss Reformer, who tried in vain to dissuade Rome from endeavouring to crush Luther by a bull of excommunication. It was too late. The great step had been decided upon.

Luther meanwhile continued his course of preaching and lecturing at Wittemberg, where nearly 2000 students were assembled. He published at this time his *Treatise on the Mass*, in which he applied to the sacraments the pervading doctrine of faith, proving from Scripture that every sacrament is dead without faith in God's word and promises. But his most striking work of this period is that on the *Babylonian Captivity of the Church* (October 1520), in which he boldly took the offensive against Rome, attacking papacy in its principles. It is remarkable that in this treatise he speaks of the baptism of infants, who necessarily are incapable of faith, as of an apparent contradiction, which, however, might be defended. Man is to have faith in the baptismal vow (to be ratified later, after the necessary instruction), and therefore he must not allow himself to be bound by any other vow, and must consider the work of his vocation, whatever it be, as equally sacred with that of priest or monk. Till the Christian church is organized upon that principle, the Christian people live in Babylonian captivity. In order to please some of his friends, and show to the world that he was not intractable, he addressed a letter to Leo X., and inclosed a treatise, *On the Liberty of the Christian*. He pities the pope for having been thrown like Daniel into the midst of wolves, and predicts that the Roman court (*Curia Romana*) will fall because she hates reform, and that the world will be obliged, sooner or later, to apply to her the words of the prophet—“We would have healed Babylon, but she is not healed: forsake her, and let us go every one unto his own country” (Jerem. li. 9). “O most holy father, (he adds) do not listen to those flattering syrens around you!”

The treatise itself is a sublime and succinct exposition of the two truths, that by faith the soul acquires all that Christ has, and becomes free through Him; but then it begins to serve His brethren voluntarily from thankfulness to God. The pope's bull arrived in due time; but found the German nation deaf to its curses, and armed against its arguments. It was called Dr Eck's bull; and Luther raised, on the 4th November, his voice of thunder against it in a short treatise *Against the Bull of Antichrist*; and, on the 17th of the same month, he drew up, before a notary and five witnesses, a solemn protest, in which he appealed to a general council. After this manifesto, he invited the Christian bull burnt before the church door, and said,—“Now the serious work begins; I have begun it in the name of God—it will be brought to an end by his might.” But where was the power to resist the pope, if the emperor supported the pope's cause? And, indeed, he had promised this support to the pontifical minister soon after his coronation

Luther.

He is excommunicated.

Burns the pope's bull.

Luther. at Aix-la-Chapelle on the 22d October. He declared, however, at the same time, that he must act with every possible regard towards the elector; and this prince had courage enough to propose, as the only just measure, to grant to Luther a safe conduct, and place him before learned, pious, and impartial judges. Erasmus, whom he invited, in order to learn his opinion, said,—“There was no doubt that the more virtuous and attached to the gospel any man was, the more he was found to incline towards Luther, who had been condemned only by two universities, and by them had not been confuted.”

4. At the
diet of
Worms,
April 1521.

The emperor agreed at last to the proposal of the elector Frederic, and convened a diet at Worms for 6th January 1521, where the two questions of religion and of a reform in the constitution of the empire were to be treated. Luther, though in a suffering state of health, resolved immediately to appear when summoned. “If the emperor calls, it is God’s call,—I must go: if I am too weak to go in good health, I shall have myself carried thither sick. They will not have my blood, after which they thirst, unless it is God’s will. Two things I cannot do,—shrink from the call nor retract my opinions.” The nuncio and his party, on their side, moved heaven and earth to procure Luther’s condemnation, and threatened the Germans with extermination, saying,—“We shall excite the one to fight against the other, that all may perish in their own blood,”—a threat which the papists have carried out to the best of their power during 200 years. The emperor permitted the nuncio to appear officially in the diet, and to try to convince the princes of the empire there assembled. Alexander tried in vain to communicate to the assembly his theological hatred, or to obtain that Luther should be condemned as one judged by the pope, his books burnt and his adherents persecuted. The impression produced by his powerful harangue was only transitory: even princes who hated Luther personally, would not allow his person and writings and the general cause of reform to be confounded, and all crushed together. The abuses and exactions of Rome were too crying. A committee, appointed by the diet, presented a list of 101 grievances of the German nation against Rome. This startled the emperor, who, instead of ordering Luther’s books to be burned, issued only a provisional order that they should be delivered to the magistrates. When Luther heard of the measures preparing against him, he composed one of his most admirable treatises,—*The Exposition of the Magnificat, or the Canticle of the Virgin Mary*. He soon learnt what he was expected to retract. “If that is meant, I remain where I am: if the emperor will call me to have me put to death, I shall go.” The emperor summoned him, indeed, on the 6th March 1521, to appear before him, and granted him at last a safe conduct, on which all his friends insisted. Luther, in spite of all warnings, set out with the imperial herald on the 2d April. Everywhere on the road he saw the imperial edict against his book posted up, but witnessed also the hearty sympathies of the nation. At Erfurt the herald gave way to the universal request, and, against his instructions, consented to Luther’s preaching a sermon,—none the less remarkable for not containing a single word about himself. On the 16th Luther entered the imperial city amidst an immense concourse of people. On his approach to Worms, the elector’s chancellor entreated him, in the name of his master, not to enter a town where his death was decided. The answer which Luther returned was simply this:—“Tell your master, that if there were as many devils at Worms as tiles on its roofs, I would enter.” When surrounded by his friends on the morning of the 17th, on which day he was to appear before the august assembly, he said,—“Christ is to me what the head of the gorgon was to Perseus: I must hold it up against the devil’s attack.” When the hour approached, he fell upon his knees, and

uttered in great agony a prayer such as can only be pronounced by a man filled with the spirit of Him who prayed at Gethsemane. Friends took down his words; and the authentic document has been published by the great historian of the Reformation. He rose from prayer and followed the herald. Before the throne he was asked two questions,—Whether he acknowledged the works before him to have been written by himself? and whether he would retract what he had said in them? Luther requested to be told the titles of the books, and then, addressing the emperor, acknowledged them as his; as to the second, he asked for time to reflect, as he might otherwise confound his own opinions with the declarations of the Word of God, and either say too much, or deny Christ and say too little, incurring thus the penalty which Christ had denounced,—“Whosoever shall deny me before men, him will I also deny before my Father which is in heaven.” The emperor, struck by this very measured answer, which some mistook for hesitation, after a short consultation, granted a day’s delay for the answer, which was to be by word of mouth. Luther’s resolution was taken: he only desired to convince his friends, as well as his enemies, that he did not act with precipitation at so decisive a moment. The next day he employed in prayer and meditation, making a solemn vow upon the volume of Scripture to remain faithful to the gospel, should he have to seal his confession with his blood. Luther’s address to the emperor has been preserved, and is a masterpiece of eloquence as well as of courage. Confining his answer to the first point, he said, that “nobody could expect him to retract indiscriminately all he had written in those books, since even his enemies admitted that they contained much that was good and conformable to Scripture. But I have besides,” he continued, “laid open the almost incredible corruptions of popery, and given utterance to complaints almost universal. By retracting what I have said on this score, should I not fortify rank tyranny, and open a still wider door to enormous impieties? Nor can I recal what, in my controversial writings, I may have expressed with too great harshness against the supporters of popery, my opponents, lest I should give them encouragement to oppress Christian people still more. I can only say with Christ,—‘If I have spoken evil, bear witness of the evil’ (John xviii. 23). I thank God I see how that the gospel is in our days, as it was before, the occasion of doubt and discord. This is the doctrine of the Word of God,—‘I am not come to send peace but a sword’ (Matt. x. 34). May this new reign not begin, and still less continue, under pernicious auspices. The Pharaohs of Egypt, the kings of Babylon and of Israel, never worked more effectually for their own ruin than when they thought to strengthen their power. I speak thus boldly, not because I think that such great princes want my advice, but because I will fulfil my duty towards Germany, as she has a right to expect from her children.” The emperor, probably in order to confound the poor monk, who having been kept standing so long in the midst of such an assembly, and in a suffocating heat, was almost exhausted in body, ordered him to repeat the discourse in Latin. His friends told him he might excuse himself, but he rallied boldly, and pronounced his speech in Latin with the same composure and energy as at first; and the reiterated question, Whether he would retract? Luther replied,—“I cannot submit my faith either to the pope or to councils, for it is clear that they have often erred and contradicted themselves. I will retract nothing, unless convicted by the very passages of the Word of God which I have quoted.” And then, looking up to the august assembly before him, he concluded, saying,—“Here I take my stand: I cannot do otherwise: so help me God. Amen!” The courage of Luther made a deep impression even upon the emperor, who exclaimed,—“Forsooth, the

Luther.

Luther.

monk speaks with intrepidity, and with a confident spirit." The chancellor of the empire said,—“The emperor and the state will see what steps to take against an obstinate heretic.” All his friends trembled at this undisguised declaration. Luther repeated, “So help me God! I can retract nothing.” Upon this he was dismissed, then recalled, and again asked whether he would retract a part of what he had written. “I have no other answer to make,” was his reply. The Italians and Spaniards were amazed. Luther was told the diet would come to a decision the next day. When returning to his inn, he quieted the anxious multitude with a few words, who, seeing the Spaniards and Italians of the emperor’s household follow him with imprecations and threats, exclaimed loudly, in the apprehension that he was about to be conducted to prison.

The elector and other princes now saw it was their duty to protect such a man, and sent their ministers to assure him of their support. The next day the emperor declared, “he could not allow that a single monk should disturb the peace of the church, and he was resolved to let him depart, under condition of creating no trouble; but to proceed against his adherents as against heretics who are under excommunication, and interdict them by all means in his power; and he demanded of the estates of the empire to conduct themselves as faithful Christians.” This address, the suggestion of the Italian and Spanish party, created great commotion. The most violent members of that party demanded of the emperor that Luther should be burnt, and his ashes thrown into the Rhine; and it is now proved that, towards the end of his life, Charles reproached himself bitterly for not having thus sacrificed his word for the good of the church. But the great majority of the German party, even Luther’s personal enemies, rejected such a proposition with horror, as unworthy of the good faith of Germans. Some said openly they had a child, misled by foreigners, for an emperor. The emperor decided at last that three days should be given to Luther to reconsider what he had said. The theologians began to try their skill upon him. “Give up the Bible as the last appeal; you allow all heresies have come from the Bible.” Luther reproached them for their unbelief, and added: “The pope is not judge in the things that belong to the Word of God; every Christian man must see and understand himself how he is to live and to die.” Two more days were granted, without producing any other result than Luther’s declaration,—“I am ready to renounce the safe conduct, to deliver my life and body into the hands of the emperor; but the Word of God, never! I am also ready to accept a council, but one which shall judge only after the Scripture.” “What remedy can you then name?” asked the venerable archbishop of Treves. “Only that indicated by Gamaliel,” replied Luther; “if this counsel or this work be of men, it will come to nought; but if it be of God, ye cannot overthrow it, lest haply ye be found even to fight against God” (Acts v. 38, 39).

Frederic the Wise knew well that Luther’s life was no longer safe anywhere at this moment. Charles pronounced an edict of condemnation, couched in the severest terms. Luther was placed under the ban of the empire. After twenty-one days his safe conduct would expire, and all persons be forbidden to feed or to give him shelter, and enjoined to deliver him to the emperor or to place him in safe keeping till the imperial orders should arrive; all his adherents were to be seized, and their goods confiscated; his books burnt; and the authors of all other books and prints obnoxious to the pope and the church were to be taken and punished. Whoever should violate this edict should incur the ban of the empire.

This Draconian edict had been passed by the majority; the friends of Luther, foreseeing the issue, had left Worms previously. Such was the condign punishment that befell

the Germans for having chosen as their emperor the most powerful foreign prince of Europe, brought up among the most bigoted of nations. Under these circumstances, Frederic did what he could. In the forest of Thuringia, not far from Eisenach, Luther (who was not in the secret) was stopped by armed knights, set upon a horse, and conducted to the fortified castle above Eisenach—the Wartburg. Here the dress of a knight was ready for him. He was desired to consider himself as a prisoner, and to let his beard grow. None of his friends, even at Wittemberg, knew what had become of him. He had disappeared; the majority believed he had been kidnapped by his powerful enemies. Such was the indignation of the people at this supposed treachery, that the princes opposed to the Reformation, and even the pope’s agents, began to be alarmed, and took pains to convince the people that Luther had not met with ill usage.

Luther remained ten months at the Wartburg; and it was here that he began his greatest work, the translation of the Bible from the original Hebrew and Greek text. Although suffering much in health from the confinement, which he modified latterly by excursions in the woods around the castle, he soon began also to compose new works, and obtained the necessary books through Melancthon, to whom he in time made known that he was safe.

It is a most astonishing fact, highly characteristic both of Luther and of the German nation, that, though for nearly four years, the true doctrine of the gospel had been preached through Germany, and the Romish rites and ceremonies exhibited as abuses, that yet not one single word or portion of these ceremonies had been changed. Luther consciously believed, what may be called the latent conviction of his countrymen, that inward truth will necessarily correct outward errors, and mould for itself fitting forms of expression. “The Spirit of God,” he often said, “must first have regenerated minds, imbued with true gospel doctrine; then the new forms will result naturally from that Spirit.” But it was clearly an unnatural and highly dangerous state of things, that the outward acts of worship should be utterly at variance with the belief of the worshippers; and Luther saw that if he would not take the matter in hand, others were certain to do so; the people themselves might proceed to precipitate acts. Luther felt this, and so strongly, that he broke silence; and in September published a declaration against monkish vows, in the form of theses, addressed to the bishops and deacons of Wittemberg. The audacious attempt of the Cardinal-Archbishop of Mayence, Albert of Brandenburg, to renew at Halle the sale of indulgences, called forth Luther’s philippic (1st November) *Against the new Idol of Halle*.

This attack frightened even the court of the elector of Saxony, who was at that time rather of opinion that Luther could do nothing better than to cause himself to be forgotten. “I cannot allow him to attack my brother elector, and to disturb the public peace.” Luther’s greatness of soul had elevated the minds of the princes for the moment; they had saved his life, but they wished now to live in peace, such as they had before. Luther was indignant. “Do they think I suffered a defeat at Worms? It was a brilliant victory: so many against me, and not one to gainsay the truth!” To Spalatin, the chaplain and adviser of the elector, he thus writes: “How, the elector will not allow me to write! and I, for my part, will not allow him to disallow my writing. I will rather destroy you, and the prince, and every creature! Having resisted the pope, should I not resist his agents?” At the request of Melancthon, he laid aside the treatise he had prepared, but wrote to the cardinal archbishop:—“The God who raised such a fire out of the spark kindled by the words of a poor mendicant monk lives still; doubt it not. He will resist a cardinal of Mayence, even though

Luther.

5. At the Wartburg, March 1521 to Feb. 1522.

Luther. supported by four emperors; for above all He lives to lay low the high cedar, and humble the proud Pharaohs. Put down the idol within a fortnight, or I shall attack you publicly."

The cardinal was frightened by the sternness of the man of God, and had the meanness to play the hypocrite. He thanked Luther by letter for his "Christian and brotherly reproof," promising, "with the help of God, to live henceforth as a pious bishop and Christian prince." Luther, however, could not credit the sincerity of this declaration:—"This man, scarcely capable to rule over a small parish, will stand in the way of salvation as long as he does not throw off the mask of a cardinal and the pomp of a bishop."

The fact was, the cardinal elector wanted money. He had had to pay 26,000 ducats to Rome for his pallium, and the half of that sum he had charged upon the venders of indulgences in his ecclesiastical province; he himself having to spend all his princely income on his court.

6. Appears at Wittemberg, Mar. 1522. During these nearly ten months of seclusion, Luther's health suffered greatly, and subjected him to visions and hallucinations, in which he believed he saw the devil in form. His absence from his congregation, his students, and his friends and books at Wittemberg, weighed heavily upon him. Still, he held out patiently till events occurred which called upon the Reformer no longer to absent himself. He reappeared, without previous notice, among his friends at Wittemberg, whom he found in great commotion. Thirteen monks of Luther's own convent had left it on the ground of religious conviction, with the approbation of Melancthon, who also countenanced the general demand for the abrogation of the mass. "What we are to celebrate," said he, "in the communion, is a sign of the grace given us through Christ, but differing from symbols invented by man by its inward power of rendering the heart certain of the will of God." This is the simplest and truest form of Luther's own view of the Lord's Supper, when he looked on it not scholastically. There is a reality in Christ's sacrifice for us; indeed, it is the reality of our destiny that we remember it, as He has bidden His disciples to do: it has therefore naturally an inward force, not an imaginary effect, like looking on a cross and similar outward forms. What calamities would the world have been spared if this view, in its profound simplicity and depth, had not been dressed up in formularies partaking of that very scholasticism which the Reformation was to abolish! The prior of the convent discontinued from that time low masses. It was high time, indeed, that this central point of Christian worship should be taken in hand by the Reformers; for at Zwickau, in Saxony, an enthusiast, named Stork, arose, who pretended to have a commission from the archangel Gabriel to reform and govern the church and the world, and who was supported in this by a fanatic named Thomas Munzer. When they appeared at Wittemberg announcing their visions, even Melancthon was startled, and especially hesitated as to the question of pædo-baptism. Carlstadt, Luther's disciple and friend, advocated the most revolutionary changes. He broke down the images, preached against learning and study, and exhorted his hearers to go home and gain their bread by digging the ground. Luther did not hesitate a moment to condemn the whole movement as a delusion for men who gloried in their own wisdom, which could only cause a triumph to the enemies of reform. At an interview which he had with Munzer and Horst, they said they could prove to him that they had the Spirit; for they would tell him what now passed in his mind. Luther challenged them to the proof. "You think in your own heart that we are right," Luther exclaimed.—"Get thee behind me, Satan," and dismissed them. "They were quite right," he said to his friends afterwards; "that thought crossed my mind as to some of their assertions. A spirit evidently was in them, but what could it be but the evil one?" Here we see the difference

between Luther and Melancthon. Luther was not startled from his solid judgment as Melancthon had been by this movement; and Melancthon, in after years, was a more violent antagonist of anabaptism than Luther.

It was on the 3d of March 1522 that Luther left for ever his asylum, and plunged into the midst of struggles very different in their character from those which he had hitherto so victoriously overcome. Before arriving at Wittemberg, he wrote a remarkable letter to the elector:—"You wish to know what to do in the present troublesome circumstances. Do nothing. As for myself, let the command of the emperor be executed in town and country. Do not resist if they come to seize and kill me; only let the doors remain open for the preaching of the Word of God." One of the editors of Luther's works observes on the margin,—"This is a marvellous writing of the third and last Elijah." The elector was touched by Luther's magnanimity. "I will take up his defence at the diet; only let him explain his reasons for having returned to Wittemberg, and say he did so without my orders." Luther complied, adding,—"I can bear your highness' disfavour. I have done my duty towards those whom God has intrusted to me." And, indeed, he made it his first duty to preach almost daily the gospel of peace to his flock. "No violence!" he exclaimed, "against the superstitious or unbelieving. Let him who believes draw near, and let him who does not believe stand aloof. Nobody is to be constrained; liberty is essential to faith and all that belongs to it. . . . You have acted in faith," he said, "but do not forget charity, and the wisdom which mothers show in the care of their children. Let the reform of the mass be undertaken with earnest prayer. The power of the word is irresistible: the idols of Athens fell not by force, but before the mighty words of the apostle." This evangelical meekness of the man who had braved pope and emperor, and knew not fear, acted with divine power upon all minds. The agitation and sedition disappeared. The pretended prophets dispersed, or were silenced in public debate.

On the 21st September 1522 the translation of the New Testament appeared in 2 volumes folio, which sold at about a ducat and a half. The translation of the Old Testament was commenced in the same year. Thousands of copies were read with indescribable delight by the people; who had now access to the words of Him whom Luther had preached to them as the author of our salvation, in their mother tongue, in a purity and clearness unknown before, and never surpassed since. By choosing the Franconian dialect in use in the imperial chancery, Luther made himself intelligible both to those whose vernacular dialect was High German or Low German. Luther translated faithfully but vernacularly, with a native grace which up to this day makes his Bible the standard of the German language. It is Luther's genius applied to the Bible which has preserved the only unity which is, in our days, remaining to the German nation,—that of language, literature, and thought. There is no similar instance in the known history of the world of a single man achieving such a work. His prophetic mind foresaw that the Scripture would pervade the living languages and tongues all over the earth—a process going on still with more activity than ever.

Meanwhile the vanity and presumption of Henry VIII. induced him to publish a book against Luther, in which he heaped upon Luther every opprobrious epithet; even called in question his honesty and sincerity, and declared him worthy to be burned. His *Defence of the Seven Sacraments* merely recapitulates the old scholastic tradition without the slightest understanding of the Bible or of the evangelical doctrine. Henry's ambassador declared to the pope, in presenting the book, that the king was now ready to use the sword against Luther's adherents, after having

Luther. refuted the errors of Luther himself. Luther, after having read the book, declared, contrary to the desire of the elector and of his other friends, that he must answer it. "Look," he writes, "what weapons are used against me: fire and the fury of those stupid Thomists. Let them burn me: alive I shall be the enemy of popery; burnt I shall be its ruin. Everywhere they will find me in their way, like a bear or a lion." In the answer itself he pays the king in his own coin. After having taken the crown from his head and beaten him like any other controversial writer, he exclaims,—"I cry gospel, gospel! Christ, Christ! and they cease not to answer,—Usages, usages! ordinances, ordinances! fathers, fathers! The apostle St Paul annihilates with a thunderstorm from heaven all these fooleries of Henry." The king wrote to the elector and the dukes of Saxony, exhorting them to extirpate this heresy, as being the revival of that of Wycliffe. Their answer referred Henry to the future council. The cause of the Reformation suffered nothing from Henry's attacks and the invectives of his courtiers. The movement against the sacerdotal and monkish vows extended through the whole of Germany—affecting equally priests and laymen. Zealous preachers of the gospel rose from all ranks. Noble and pious women came forward to declare their faith. Luther's activity was unparalleled. In 1522 he published 130 treatises, and 83 in the following year.

The whole national literature of Germany became Protestant; and it is certainly a remarkable fact, that, in spite of the Reformation having since lost almost one-half of Germany, its literature, as well as its historical learning and philology, still remains Protestant. All the free cities, which were the cradle of the fine arts as well as of the wealth of the country, declared in favour of the Reformation. In Saxony there was, as Luther had proposed and demanded, perfect liberty of conscience: the Romish bishops had their preachers as well as the Reformers.

Luther's heart expanded in the consciousness of the Reformers' success such as he had never hoped to see. But he shrunk from the idea that this work should be regarded as his, and that he should have the honour of it. "My true disciples," he said, "do not believe in Luther, but in Jesus Christ; I myself care nothing about Luther. What is it to me whether he be a saint or a miscreant? It is not him I preach, but Christ. If the devil can, let him have Christ; but if Christ remains ours, we also shall subsist."

When Leo X. died in this year (1522), Adrian, the Flemish tutor of Charles V., his successor, a single-minded professor, could not (as Jarus tells us) at first conceive how people could find a difficulty in the matter of indulgences, which he had explained so well in his lectures, till a cardinal remarked to him, that the unbelieving people had no faith in indulgences whatsoever, and that some of those who believed in Christ, thought that exactly for that reason they did not want them. "The church must reform," said he, "but step by step." "Yes," said Luther, "putting some centuries between every step." Nobody wanted his reforms less than the Romans; and Adrian exclaimed at last,—"How unfortunate is the position of the popes, who are not even free to do good."

In November 1522 the diet assembled at Nuremberg on account of an impending war with the Turks. While the nuncio and the bishops demanded Luther's death, the churches of the imperial free city resounded with the doctrine of the gospel; monks being amongst the most zealous preachers. What a change from the state of things at Worms in April 1521! The municipal council of the free city declared that if those preachers were to be seized by force, they would instantly set them free by force. The legate was obliged to abandon his plan of arresting them in the pope's name, as the diet declared itself incompetent to do so. Adrian's sincere avowal of the horrible abuses of Rome

confirmed the people in the belief that Luther and the gospel were right, and made his threatening brief addressed to the elector, whom he declared worthy of death and eternal damnation, appear as ridiculous as it was arrogant. Luther and all his friends, whose advice the elector asked at this critical moment, declared that he ought not to fight for the gospel, seeing that the people, without whose consent he could not declare war, would not in the spirit of faith declare for such a measure. But other princes were frightened, because they had no faith whatever, except in superior strength and power of pope and emperor. "Let them take care," said Luther, "if they persecute the gospel, there will be a rebellion and civil war, and the princes will be in danger of losing their dominions. They wish to destroy me, but I wish to save them. Christ lives and reigns; and I shall live and reign with Him." Indeed, a bloody persecution began in many parts of Germany and in the Netherlands. Four Augustinian monks of Antwerp were the first martyrs; they were burnt on the 1st July 1523. Their blood called forth a rich harvest of new witnesses in Brussels and elsewhere.

When the successor of Adrian VI., Clement VII. (Julius de Medici), sent in 1524 the celebrated legate Campeggi to Nuremberg, he intended, according to usage, on passing through Augsburg, to give the people the papal benediction; but finding that the ceremony called forth public derision, the legate entered Nuremberg as much *incognito* as Luther had entered Worms two years before. The German princes asked what had become of the 101 grievances of the German nation, to which Rome never had deigned to return an answer. Campeggi declared the document to have been considered at Rome merely as a private pamphlet; on which the diet, in great indignation, insisted upon the necessity of an universal council, and proceeded to annul the edict of Worms; declaring, however, in their communication to the pope, that "it should be conformed to *as much as possible*;" which, with respect to many princes and cities, meant *not at all*. Finally, it was resolved that a diet, to be held at Spire in November, was to decide on religious differences. Many states which had hitherto kept aloof,—the landgrave of Brandenburg (not the elector, a strong papist) at the head,—declared immediately for the reform, and against the seven sacraments, the abuses of the mass, the worship of saints and supremacy of the pope. "That is a good move," said Luther. "Frederic must lose his electoral hat," cried the Roman agent, "and France and England must interfere." A catholic league was formed, by Bavarian and other bishops, at Ratisbon under Campeggi's direction and presidency. But the princes were still afraid of the universally spreading national movement. Charles threw his power into the balance, and declared that not the German nation, but the emperor alone, had a right to demand a council, and the pope alone had the right to grant it. His designated successor, his brother Ferdinand, began the bloody work of persecution in the hereditary states of Austria immediately after the congress of the league at Ratisbon. At Passau in Bavaria, and at Buda in Hungary, the faggots were lighted. The dukes of Bavaria followed the same impulse.

Meanwhile, began at Wittemberg the unhappy dispute about the mode in which the consecration affected the elements in the celebration of the communion enjoined by Christ. Luther as yet had not taken up that doctrinal scholastic opinion, which afterwards produced the fatal schism. In opposing Carlstadt's view, he combated not so much the later Swiss exposition as Carlstadt's false interpretation of the words, "This is my body," which was, that Christ, in pronouncing them, had pointed to his own body, which soon would die. He admitted soon afterwards, in reference to that exposition, in 1520, that he was very near thinking the Swiss interpretation the reasonable view of the case, but that he had rejected the notion as a "tempta-

Luther.

7. Luther
and the diet
at Nurem-
berg, Nov.
1522.

The Catho-
lic league.

Luther. tion," the words of the text seeming to him not to allow of that interpretation.

8. Luther the practical reformer.

But in the same manner as this dispute was a prelude to the fatal sacramental disputes with Zwingli and Calvin, Luther's defeat in the attempt to detach the congregation of a small town (Orlamunde, near Jena) from Carlstadt, who introduced iconoclastic and violent proceedings, proved an index of the critical state of public feeling. Luther felt the urgent necessity of applying the principles of the gospel to Christian worship and to the constitutions of the church. But, on the first point, he wished changes to be introduced gradually, and rather as a purification of the existing forms, than by an abrogation. While as to the second, he felt that it was not his immediate vocation, and he thought he must leave the work to the princes, and content himself with preaching to them the leading evangelical principles. This, of course, was not the view of the real friends of the Reformation, nor was it consistent with Luther's usual profound sagacity, but must be regarded as a remnant of the effect produced by his monkish scholastic education brought into accordance with Christianity. His more practical, and perhaps impatient friends wanted to see the pagan condition of the world, with its social relations, changed into a Christian state of things, as an earnest and pledge of the reality of the gospel preaching. Still, for some time longer, Luther and the popular feeling marched peaceably together, and he remained the national as well as the theological leader. It was at this time that he directed a powerful address to the municipal councils of the German towns, in order to exhort them to establish everywhere Christian schools, as well elementary as learned. "Oh, my dear Germans (he exclaims), the divine word is now in abundance offered to you: God knocks at your door; open it to him! Forget not the poor youth. Look how the ancient Jewish, Greek, and Roman world lost the Word of God, and perished. The strength of a town does not consist in its towers and buildings, but in counting a great number of learned, serious, honest, well-educated citizens. Do not fancy Hebrew and Greek to be unnecessary. These languages are the sheath which cover the sword of the Spirit. The ignorance of the original Scriptures was an impediment to the progress of the Waldenses, whose doctrine is perfectly pure. How could I have combated and overthrown pope and sophists, even having the true faith, if I had not possessed the languages? You must find libraries for learned books,—not only the fathers, but also the pagan writers; the fine arts, law, history, medicine, must be represented in such collections." These expressions prove that from the very beginning and in the very person of Luther, the Reformation was connected with scholarship—with philology in its most extended sense, and equally with the highest aspirations of the fine arts.

Gives impulse to education.

Here we must conclude this first glorious period of Luther's life, which, taken altogether, has no parallel since the days of the apostle Paul. But the problem to be solved was not to be solved by Luther and by Germany: the progressive, vital element of reformation passed from Germany to Switzerland, and through Switzerland to France, Holland, England, and Scotland. Before he descended into the grave and Germany into thralldom, Luther saved (as much as was in him) his country and the world, by maintaining the fundamental principles of the Reformation against Melancthon's pusillanimity: but three Protestant princes and the free cities were the leaders; the confession was the work of Melancthon, but the deed of the laity of the nation. The German Reformation was made by a scholastically trained monk, seconded by professors; the Swiss Reformation was the work of a free citizen, an honest Christian, trained by the classics of antiquity, and nursed in true, hard-won, civil liberty. That was the providential saving of the world. Luther's work was

continued, preserved, advanced by the work of the Swiss and French Reformers. The monk and the Semitic element began; the citizens and the Japhetic element finished. If the one destroyed Judaism, the other converted paganism, then most powerful, both as idolatry and as irreligious learning. But as long as Luther lived he did not lose his supremacy, and he deserved to keep it. His mind was universal, and therefore catholic in the proper sense of the word.

Luther.

THIRD PERIOD:—*Luther's Life from 1525 to 1546; or the Period of Stagnation.*

The first year after Luther's return to Wittenberg was a glorious period: the true halcyon days of the Reform and of Luther's personal history. In the second period of his life, the epic was changed into tragedy; for the Anabaptist tumult arose, and the war of the peasants broke out in the Black Forest in July 1524.

The Anabaptist movement of Thomas Munzer was the 1. War of movement of Carlstadt mixed up with wild enthusiasm, the peasants. ignorance, rebellion, and imposture. Luther's doctrinal opposition to it was constant and consistent; but it would have been more effectual if Luther had not involved himself as a schoolman in an indissoluble difficulty. He was safe in defending pædo-baptism; but that could be done without ascribing to it the power of individual regeneration: an opinion from which the greatest part of Christendom has most decisively declared its dissent all over the globe. He was equally justified in maintaining the word of the gospel: "Whoever believes, and is baptized, shall be saved;" but he ought not to have forgotten that this is a juxtaposition of two things, of which the one can only be of value as a consequence of the first. This brings the question back to a solemn profession and vow before the Christian congregation of him who, having been instructed in Christ's saving faith, finds himself ready and compelled to make that solemn promise, which St Peter calls (1st Peter iii., 21),—"the promise (or vow) of a good conscience." Munzer and all the other so-called apostles of the Spirit attacked Luther as a mere worldly man who had sold himself to the princes. They abolished chaunting and all ceremonies, and committed acts of violence against churches and convents. Luther said to Munzer,—“The spirit who moves thee must be an evil one, for it brings forth nothing but pillage of convents and churches; the greatest robbers on the earth could do no more.” While combating them by preaching and writing, he advised, however, the elector to let them preach freely. “The Word of God itself must come forward and contend with them. If their spirit is the true one, Munzer will fear our constraint; if ours is the true one, he will not fear their violence. Let the spirits meet with all might, and fight each other. Perhaps some will be seduced; well, there is no battle without wounds; but he that fights faithfully will be crowned. But if they have recourse to the sword, then defend your own subjects, and order the Anabaptists to leave the country.”

It was indeed a wonderful faith that produced such toleration in these times, and it had a wonderful result;—the elector's states remained undisturbed. Munzer fled into Switzerland.

It was otherwise with the war of the peasants. We have already observed that the Reformation did not originate the rebellion of the peasants, but found it prepared. The first coalitions of the peasants against the intolerable rapacity and cruelty of the feudal aristocracy had begun before the close of the fifteenth century; then they broke out along the Upper Rhine, in Alsace, and the palatinate, in 1503; consequently 18 years before the beginning of Luther's Reformation. No doubt Luther's preaching, in the spirit of the gospel, against all the revolting injustice and oppression of the conscience of Chris-

Luther.

tian men, had kept back that movement for a time; but Munzer carried the spirit of rebellion and fanaticism among the peasants and part of the citizens of the countries of the Upper Rhine. The fact was, that all the oppressed inclined towards Luther, and the oppressors, most of whom were the sovereigns, bishops, and abbots, towards the pope. The struggle which now began was therefore between the reforming and the papist party, and it was easily to be foreseen that Luther would soon be dragged into it. Indeed, the revolutionary movement was already, in January 1525, extending from the Black Forest to Thuringia and Saxony, the very heart of Luther's sphere of action. The peasants had proclaimed twelve articles, of half biblical half political character. In the introduction to these articles they protest against the imputation of wanting anything but the gospel applied to the social body. They declare their desire to uphold its injunctions—peace, patience, and union. There is no doubt that many of them were sincere in their professions. At all events, neither the gospel nor its true preachers and followers were the revolutionists, but the wild, selfish, passionate enthusiasts among them and their leaders. Like the Puritans in the following century, the peasants say they raise their voice to God who saved the people of Israel; and they believe that God can save them as well from their powerful oppressors as he did the Israelites from the hand of Pharaoh.

Luther's address to the lords.

As to what they demanded in their twelve articles, all impartial historians declare that on the whole their demands were just; and all of them are now the law of Germany. As to the influence of the Reformation, the very words of Scripture brought forward this time by the peasants, prove clearly that Luther's preaching of the gospel and of truth had not acted upon the movement as an incentive but as a corrective. It was Luther himself who now, in the critical moment, brought the Word of God to speak out against the insurrection, as being in itself an act of unchristian self-defence, although he acknowledged their case to be very hard, and their cause, on the whole, a just one. Luther's position was grand; he spoke as the arbiter between lord and peasant; in the name of Christ exhorting both parties to peace, and as a good citizen and patriot giving them advice equally practical and Christian. He first speaks thus in substance to the lords:—"I might now make common cause with the peasants against you, who impute this insurrection to the gospel and to my teaching; whereas I have never ceased to enjoin obedience to authority, even to one so tyrannical and intolerable as yours. But I will not envenom the wound; therefore, my lords, whether friendly or hostile to me, do not despise either the advice of a poor man, or this sedition; not that you ought to fear the insurgents, but fear God the Lord, who is incensed against you. He may punish you and turn every stone into a peasant, and then neither your cuirasses nor your strength would save you. Put then bounds to your exactions—pause in your hard tyranny—consider them as intoxicated—and treat them with kindness, that God may not kindle a fire throughout Germany, which none will be able to extinguish. What you may perhaps lose will be made good to you a hundred-fold by peace. Some of the twelve articles of the peasants are so equitable that they dishonour you before God and the world; they cover the princes with shame, as the 109th Psalm says. I should have yet graver things to tell you respecting the government of Germany, and I have addressed you in this cause in my book to the German nobility. But you have considered my words as wind, and therefore all these demands come now upon you. You must not refuse their demand as to choosing pastors who preach to them the gospel; the government has only to see that insurrection and rebellion be not preached; but there must be perfect liberty to preach the true gospel as well as the false. The remaining articles, which regard the social state of

the peasant, are equally just. Government is not established for its own interest, nor to make the people subservient to caprice and evil passions, but for the interest of the people. Your exactions are intolerable; you take away from the peasant the fruit of his labour, in order to spend his money upon your finery and luxury. So much for you."

Luther.

"Now, as regards you, my dear friends, the peasants. You want the free preaching of the gospel to be secured to you. God will assist your just cause if you follow up your work with conscience and justice. In that case you are sure to triumph in the end. Those of you who may fall in the struggle will be saved. But if you act otherwise you are lost, soul and body, even if you have success, and defeat the princes and lords. Do not believe the false prophets who have come among you, even if they invoke the holy name of the gospel. They will call me a hypocrite, but I do not mind that. I wish to save the pious and honest men among you. I fear God and none else. Do you fear Him also, and use not His name in vain, that He may not punish you. Does not the Word of God say: 'He who takes up the sword, shall perish by the sword;' and 'Let every soul be subject to the higher powers.' You must not take justice into your own hands; that is also the prescription of the natural law. Do you not see that you put yourself in the wrong by rebellion? The government takes away part of what is yours, but you take away all in destroying principle. Fix your eye on Christ at Gethsemane rebuking St Peter for using the sword although in the defence of his master; and on Christ on the cross praying for his persecutors. And has not his kingdom triumphed? Why have pope and emperor not been able to put me down? Why has the gospel spread the more the greater the effort they made to hinder and destroy it? Because I have never had recourse to force, but preached obedience even towards those who persecuted me, depending exclusively on God. But whatever you do, do not try to cover your enterprise by the cloak of the gospel and the name of Christ. If war there must be, it will be a war of pagans, for Christians use other weapons: their general suffered the cross, and their triumph is humility; that is their chivalry. Pray, my dear friends, stop and consider before you proceed further. Your quotations from the Bible do not prove your case."

After having thus spoken out boldly and fearlessly to each party, Luther concludes with a touching expostulation to both. The substance of his address is in these words:—"You see you are both in the wrong, and are drawing the divine punishments upon you and upon your common country, Germany. My advice would be that arbitrators should be chosen, some from the nobility, and some from the towns. You both have to give up something; let the matter be settled equitably by human law."

This certainly was the voice of the true prophet of the age, if ever there was any. It was not heard. The lords showed little disposition towards concessions, and what they did offer came too late, when the bloody struggle had already begun. The peasants, excited by Munzer, exceeded, on their side, all bounds, and Luther felt himself obliged, when the stream of rebellion and destruction rolled on to Thuringia and Saxony, to speak out most strongly against them. The princes leagued together (for the empire, of course, did nothing, Charles having full employment in Spain), and the peasants were routed everywhere. Fifty thousand of their party were slain or butchered by wholesale executions. Among this number there were many of the quietest and most moderate people made victims in the general slaughter, because they were known or suspected to be friends of the Reformation and of Luther, which, indeed all the citizens and peasants of Germany were at that time.

None felt more deeply this misery, and what it involved

Luther. In its effects on the cause of the gospel in Germany; and he never recovered the shock. He thus unburdens his soul at the close of this fatal year, which crushed for centuries the rights and hopes of the peasants and labourers, and weakened the towns and cities, the seats of all that was best in the national life:—"The spirit of these tyrants is powerless—cowardly—estranged from every honest thought. They deserve to be the slaves of the people. But by the grace of Christ I am sufficiently revenged by the contempt I have for them, and for Satan their god. And in the next year he said, "I fear Germany is lost; it cannot be otherwise, for they will employ nothing but the sword."

2 General
disunity:
Luther's
struggles,
1525.

In all this Luther stands higher than ever, but as a sufferer. He sees the work in Germany is lost for this time. He submits, and is supported by his faith. So he is consoled when he sees how Ferdinand of Austria and the Duke of Bavaria imprison and slaughter Christians on account of the gospel, and that not only the pope and the emperor are leagued together against the Reformation, but also the king of France, besides the king of England. All the powers of the world are against him: Germany is doomed to perish, but the word and the work of God cannot perish. Even the sad results of a general visitation of the churches which he undertook throughout the states of the elector did not shake his faith. He sees how ignorant and savage all these wars and revolts have rendered even the Protestant congregations; but he says the spirit of God will not forsake them. The elector Frederic, Luther's timid but honest supporter, had descended into the tomb on the 5th May 1525, confessing on his deathbed his firm belief in Christ as his only saviour. His successor, John, known by the well-deserved name, John the Constant, followed in his footsteps, and was a firm friend to Luther.

But the Romish league also gained friends in the north of Germany. Duke George of Saxony had, in July of this year, concluded at Dessau an alliance against the Reformation with Albert of Brandenburg, archbishop of Mainz and Magdeburg, and with the dukes of Brunswick, and proved himself in earnest by causing two citizens of Leipzig to be beheaded for having the writings of Luther in their houses. At the same time, Charles declared from Spain his intention to hold a diet at Augsburg, evidently in order to crush the Reformation by means of the Catholic league acting in the name of the empire. His victory at Pavia made him more than ever the master of Germany. Finally, the remains of the party of Munzer declared they would take the life of Luther as a traitor.

His mar-
riage.

It was under such auspices that Luther decided at last to take a wife, as he had long advised his friends among the priests and monks to do. They had often reminded him of his profession, and of the duty of himself setting an example to prove his sincerity. His father himself urged him continually to marry. All around him was now in a stationary, if not a retrograde state. The university of Wittemberg had suffered much during the late troubles, and it was generally believed that the new elector did not mean to support it. Luther's warm and loving heart opened the more readily to the contemplation of matrimonial union with Catherina von Bora, a lady 24 years of age, of a noble Saxon family, in 1523, who had left her convent, together with eight other sisters, in order to worship Christ without the oppression of endless ceremonies, which gave neither light to the mind nor peace to the soul. Since that time they had lived together in utter retirement, forming a free Christian community. Pious citizens at Torgau were their protectors, and by them they were presented to Luther in the convent of the Augustinians. Soon followed, as we have seen, the great regenerative movement of the Christian worship; and Luther appeared, on the 9th October 1524, before the congregation in the simple habit of a secular priest. Luther soon remained alone in the convent; all the monks had left it. At the end of the year he sent

the key to the elector, who, however, desired him to continue to inhabit it. In the meantime, Luther had observed and witnessed the Christian faith and life of Catherina von Bora, and on the 11th of June he married her, in the presence of Lucas Cranach, the celebrated painter, and of another friend, as witnesses. Catherina von Bora had no dowry, and Luther lived on his appointment as professor; he would never take money for any of his books, but only some copies for presents. His marriage was a happy one, and was blessed with six children. Luther was a tender husband and the most loving of fathers.

Luther.

The princes who were friendly to the Reformation gradually gained more courage; the Elector John of Saxony established the principle in his states that all rites should be abrogated which were contrary to the Scriptures, and that the masses for the dead be abolished at once. The young Landgrave Philippe of Hesse gained over the son of the furious Duke George to the cause of the Reformation. Albert, Duke of Prussia, had established it at Königsberg, as hereditary duke, abolishing the vows of the Order, whose master he had been, saying:—"There is only one Order, and that is Christendom." At the request of the pope, Charles placed Albert under interdict as an apostate monk. The evangelical princes found in all these circumstances a still stronger motive to act at Augsburg as allies in the cause of the evangelical party; and when the diet opened in December 1525, they spoke out boldly:—"It is violence which brought on the war of the peasants. If you will by violence tear the truth of God out of the hearts of those who believe, you will draw greater dangers and evils upon you." The Romanist party was startled. "The cause of the holy faith" was adjourned to the next diet at Spire. The landgrave and the elector made a formal alliance in February 1526, at Torgau.

3. Progress
of practical
Reformation.

Alliance to
support the
Reformation,
1526.

Luther being consulted as to his opinion, felt helpless. "You have no faith; you put not your trust in God; leave all to Him." The landgrave, the real head of the evangelical alliance, perceived that Luther's advice was not practical—that Luther forsook the duty of self-defence and the obligation to do one's duty according to the dictates of reason, in religious matters as well as in other political questions. But the alliance found no new friends. Germany showed all her misery by the meanness of her princes and the absence of any great national body to oppose the league formed by the pope, the emperor, and the Romanists, throughout Europe. The archbishop of Treves preferred a pension from Charles to the defence of the national cause. The evangelically-disposed palatine desired to avoid getting into trouble on that account. The imperial city of Frankfurt, thus surrounded by open enemies and timid friends, declined to accede to the alliance. There was more national feeling and courage in the Anglo-Saxon north of Germany. The princes of Brunswick, Luxemburg, Mecklenburg, Anhalt, and Mansfeld, assembled at Magdeburg, and made a solemn and heroic declaration of their resolution to pledge their estates, lives, states, and subjects, for the maintenance of the holy Word of God, relying on Almighty God, as whose instruments they would act." The town of Magdeburg (which then had about three times as many inhabitants as now) and Duke Albert of Prussia adhered to the alliance. The league doubled its efforts. Charles, strong and rendered safe by the peace of Madrid concluded with Francis, sent word from Seville in March 1526, through the Romish Duke Henry of Brunswick, that he would soon come himself to crush the heresy. Luther saw the dangers crowding around him: his advice was,—"We are threatened with war; let us force our enemies to keep the peace, conquered by the Spirit of God, before whose throne we must now combat with the arms of prayer; that is the first work to be done."

Towards the end of 1525, Luther had resolved to answer a book which had been written against him in the previous au-

Luther.
4. Erasmus
against
Luther.

tumn by Erasmus, under the catching title "*On Free Will*." Erasmus was in his heart rather a sceptic: he would in his earlier days have professed openly the cause of the gospel, and defended it with his superior erudition and knowledge, had he believed in its success; but neither the Swiss nor the German Reformation gave him that certainty, and thus, at last, he gave way to King Henry and others, who urged him to attack Luther. No controversy has been less generally understood than this; but it may also be said that it might have been carried on not only with less malice by Erasmus, but also with more speculative skill by Luther. The antagonism is essentially the same as that of Augustine and Pelagius, or that between the Jansenists and Jesuits: a better speculative method and a deeper philosophy of the mind have since shown how the scholastic method never could solve that most important as well as most difficult problem. We have no hesitation in saying that the result of dialectic metaphysics is no other than that Luther was perfectly right and Erasmus totally wrong, in this dispute; but it was hopeless from the beginning. Erasmus defined free will as the faculty of man to decide for himself, be it for good or evil. Consequently, to deny his thesis in this sense would have been to deny the moral responsibility of man. But Luther's ideas respecting moral free will were as dissonant from this terminology as St Paul's reasoning on faith, from the use of that word in the sense in which St James employs or rather attacks it. In regard to Luther's terms and fundamental ideas, we have touched upon them in speaking of the influence of Tauler and of the *Theologia Germanica* upon his mind, when he was disturbed by what appeared to him the dreadful consequences of the doctrine of grace and election. That theology of the German school of the fourteenth century rested upon a simpler, because deeper basis than that of Augustine, and, more lately, of Calvin and Pascal. There is in man, as a creature, the power of self-will; this is not only evil as such, but the root of all evil, and sin. The power of deciding whether or not to commit an action is therefore nothing but the power of measuring and contrasting selfish principles, neither of which being good, can produce good actions. There is no power against this selfishness of the creature but the divine principle. This, the old German school maintained, is equally an inherent element in man,—not as a creature, but as God's image,—and the instrument of the infinite, divine Spirit, which is essentially goodness, and love of what is good and true as such, apart from any reference to ourselves. To follow up this view successfully, it is evidently necessary not to establish an absolute separation between the divine principle in itself (in God, the infinite) and in man; and this was not clearly understood by Augustine (whose influence upon Luther was paramount, in consequence of his earliest impressions), and still less skilfully used by Luther. The absurdities to which, as each of the combatants proved of his opponent, the consistent following up of an antagonistic principle conducts, are shown by Kant to be the necessary organic consequence of our reasoning with finite notions upon the infinite; his antinomies of free will and necessity are those of Erasmus and Luther, divested of theological and dogmatic terms. But the same philosophy (and Kant himself, in his *Moral Philosophy*, and his *Philosophy of Religion*), shows that Christianity and the analysis of conscience and moral consciousness of ourselves teach equally what Luther maintained against Erasmus. The rationalism of Erasmus and of the Jesuits is condemned by this philosophy; and whatever may be thought of the philosophical demonstration (which we think capable of great simplification), St John and St Paul are certainly irreconcilable with it. "Erasmus ignores God," said Luther, "and that word is more powerful than any scholastic argument." Erasmus felt himself crushed by Luther's strong hits, against which his eloquence availed him nothing. "The victory must re-

Luther's
reply.

main," Luther said, "with stammering truth, not with lying eloquence;" and he concluded thus: "Who ever possessed so much science and eloquence, and such art in speaking and in writing? I have nothing of all this; but I glory in one thing—I am a Christian. May God raise you in the knowledge of the gospel infinitely above me, so that you may surpass me as much in this respect as you do already in all others." Erasmus henceforth lost all measure and philosophical equanimity, never having sought truth for its own sake.

Luther.

The diet of Spires, which was to put an end to Luther's Reformation, opened on June 25, 1526. Ferdinand indeed republished, on the 3d of August, the decree of Seville, enjoining strict execution of the edict of Worms; but, in the meantime, Clement the VII. having quarrelled with Charles, and Ferdinand being called to Hungary in order to maintain against Soliman and other competitors the crowns of Hungary and Bohemia, left to him by King Louis after the battle of Mohacz, Charles commissioned the famous Captain Frundsberg (the same who had good-naturedly accosted Luther at Worms, and who was devoted to the evangelical cause) to enlist an army in Germany against the pope, and thousands hastened to join his ranks in consequence. And thus the Reformation was saved this time, and a proposition presented by the cities was accepted, "that until a council met, every governor should, within his own states, act according to his conscience." Within a year, if not a universal, at least a national council was to meet. In consequence, the Reformation had time to consolidate itself from 1526 to 1529. The man of Germany at that time among the princes was the Landgrave Philip of Hesse, and he was enlightened by a citizen. James Sturm, the deputy of Strasburg at the diet of Spire, had convinced him that the basis of the true evangelical church was the acknowledgment of the self-government of the church by synods composed of representatives of the whole Christian people. Thus the first Protestant constitution—that agreed upon in Hesse—was essentially that which has proved since to be the most universal and the most powerful. For that constitution is neither Lutheran nor Anglican, but synodal Christianity, which has converted and is now converting and conquering the world. The constitution acknowledged the episcopal element, but not episcopal rule,—sovereignty being invested in the people of God. We admit (say the articles) no word but that of our sovereign pastor. Bishops and deacons are to be elected by the Christian people; bishops are to be consecrated by the imposition of hands of three bishops; and deacons may be instituted by imposition of the hands of the elders. The general synod is to be held annually, consisting of the pastor of each parish and of pious men elected from the midst of each church, or rather congregation, or from single churches. Three men are to be elected yearly to exercise the right of visitation. This was soon found to be an inconvenient form; six superintendents (episcopi) for life were substituted. This board of superintendents became afterwards an oligarchy, and at last a mere instrument of the state—the consequence of the disruption of Germany and the paralysis of all national institutions. Luther had professed already, in 1523 and in 1524, principles entirely identical with those established in 1826 in Hesse. But there his action ceased; he left to the princes what they had no mind to carry out; and what could a people do cut up into 400 sovereignties? Never, however, did Luther acknowledge Cesaropapism or Erastianism, as a principle and as a right. He considered the rights of the Christian people as a sacred trust, provisionally deposited in the hands of their representatives. "Where (he asked) are the people to form the synods? I cannot find them." This was a political calamity or mistake, but it was not a treason to the rights of the Christian people. Still more did Luther

5. The first
diet at
Spire,
summer
1526.—
Luther's
doings
from 1526
to 1529.

Luther. abhor the rapacity of the nobility and of the courtiers to possess themselves of the spoils of the church. It was Melancthon's influence which facilitated the despotic system, and hampered the thorough reform of the forms of worship. Luther withdrew from a sphere which was not his. He composed, in 1529, the small and great Catechisms, of which the former has maintained its place as a guide of popular doctrine up to this day; but when measures of persecution were proposed, he raised his voice against them. He wrote, in 1528, *False Teachers are not to be put to Death; it suffices to Remove them*. While Luther preached this doctrine, the most bloody persecution went on in the estates of the elector of Brandenburg (where the electress professed courageously the principles of the gospel), in Bavaria, and, above all, in the hereditary states of Austria. In February 1528 the impetuous landgrave was on the point of committing a rash act, in consequence of a forged document which had been shown to him, purporting to be a secret convention to assassinate Luther and Melancthon, and crush the evangelical princes. Philip infected the elector with his apprehensions, and violent measures of persecution were to be resorted to, when Luther and Melancthon both gave, as their solemn advice, this verdict,—“The attack must not come from our side, and the guilt of bloodshedding must not come upon us. Let the emperor know of this odious conspiracy.” The elector, however, assembled his troops; but the forgery was soon discovered when the document was communicated to the Romanist princes. The attitude taken by the Protestant princes had, however, the effect of making the archbishop of Mainz renounce, in 1528, the spiritual jurisdiction he had hitherto exercised over Saxony and Hesse. But among the public at large, all believed in the existence of a secret plot against the evangelical party.

6. The second diet of Spire, 1529. Under these auspices was opened the celebrated diet of Spire in 1529. The emperor, who, in the meantime, had taken Rome, and annihilated the ambitious plans of Clement VII., now took again to his natural part. German credulity and good nature had served his turn. Now that he felt himself master of the field, he spoke as a Spanish despot; the elector and landgrave were forbidden to celebrate divine worship in their hotels, as they had done in 1527, after the use of a church had been denied them. The imperial commissioners desired to return to the edict of Worms of 1521. The solemn act of toleration voted by the diet of 1527 was abrogated by an arbitrary act of the emperor alone, contrary to the constitution of the empire. Luther, the proscribed, was not present; but Melancthon, who had accompanied the princes, reported to him what passed. The majority of the diet passed at last, on 7th April, a resolution, that where the edict of Worms could not be executed without fear of revolution, no further reform would be allowed. This evidently was nothing but the intended forerunner of the restoration of Popery.

The protestation and Protestants' isin. It was against this iniquitous decree that the elector, the landgrave, the margrave of Brandenburg, the prince of Anhalt, and the chancellor of Luneburg, together with the dignitaries of the towns, laid down that solemn protestation from which originates the name of “Protestants.” “The diet has overstepped its authority,” they said; “our acquired right is, that the decree of 1526, unanimously adopted, do remain in force until a council can be convened. Up to this time the decree has maintained the peace since, and we protest against its abrogation.” Of thirty-five free cities, fourteen stood out firmly, when Ferdinand threatened them with the loss of their privileges. Strasburg, which was at the head of the protesting cities, was placed by this most arbitrary act under the interdict. To the princes Ferdinand declared there remained nothing for them but to submit; and he closed the diet without awaiting the resolutions of the

Luther. evangelical princes, who had passed, as was the constitutional custom, into an adjoining apartment in order to deliberate. The princes then drew up their declaration, and caused it to be read to the diet, which had remained sitting when Ferdinand rose with the imperial commissioners.

The celebrated Protest of the 15th April 1529, is one of the finest and noblest documents of Christian history, displaying an apostolic faith in Christ and Scripture, and a dignified adherence to national law as far as constitutional liberties are concerned. The protesting princes and cities claim as their right, as Germans, what they consider a sacred duty as Christians,—freely to preach the Word of God and the message of salvation, that all who will hear it may join the community of the believers. This great act was, besides, an earnest of true evangelical union; for it was well known that most of the cities inclined more towards Zwingle's than towards Luther's view of the sacrament. And this union was not a negative but a positive one; it was founded on the faith, energetically and sincerely professed by Cœcolampadius, as the organ of the Swiss Reformed churches, that, “with the visible symbols invisible grace is given and received.”

If one considers this great act impartially, it is impossible not to see that neither Luther nor Melancthon were the real leaders of the time. Already in 1526, Luther had so little real comprehension of what ought to be done, or was now doing in Germany, to preserve the gospel from destruction, that he wrote to a friend on the very same day that the decree of that first diet at Spire was published:—“The diet is going on in the German way,—they drink and they gamble; for the rest, nothing is done there.” He shows no sympathy for the first attempt made in Hesse at self-government of the church; still less did he see the importance of the great act now achieved at Spire by the combined courage and Christian common sense of some few princes, and all cities which could act freely. It was evident that Charles was now, after the peace of Cambray, perfect master of Germany; so far, at least, as to make it impossible that Germany should become a Protestant nation, and that the protesting princes and cities had seen the necessity of strengthening that alliance of which they had just laid the foundation. Luther dissuaded the elector from sending deputies to the meeting agreed upon to be held at Schmalcalden. “In silence and rest will be your strength,” was his vote. The elector sent deputies in order to hinder that anything should be decided. Luther was proud of this success. “Christ the Lord will deliver us without the landgrave, and even against the landgrave,” was his saying. This apparent blindness and perversion of mind in Luther at this time admits a twofold explanation. The first is Luther's loyal and sound policy. He abhorred rebellion, and shuddered from a civil war, even if it should be unavoidable as self-defence. He besides saw clearly that the princes, divided among themselves as they were, could do nothing against the emperor without the best part of the nation, represented by the cities; and that here, too, there was want of mutual trust and good-will, and above all of unity. But this key opens only the outer door to Luther's mind. To understand him, when he seems proof against reason, and reasoning even his own, it is necessary to consider his unshaken faith, and that he partook of the quietism of his German master, Tauler, and the *Theologia Germanica*. “Suffer God to do his work in you and about you,” was the motto of that school. But the scholastic training also had its influence as to his view of the Zwinglian Reformation, and it centred in Luther's sacramentalism. This point requires a more ample consideration.

It must be confessed that there was a theological scruple at the bottom of Luther's opposition to a vigorous Protestant alliance and national attitude, which was sure not to bring on war, but to prevent it by making the execution of

Luther.
7. The key to Luther's controversy with the Zwinglians as to the sacraments.

the aggressive plans of the pope and emperors impossible. This betrays itself, first, in an uneasiness about Zwingli's rising influence in Germany; and, second as a doctrinal idiosyncrasy respecting the sacrament of the communion. Philip of Hesse instantly saw through this, and said,—“I see they are against the alliance on account of the Zwinglians; well, let us see whether we cannot make these theological differences disappear.” It is well known that all the efforts made to effect a union between the Zwinglian and Lutheran parties, from the conference at Marburg, in 1529, to the end of Luther's life, were fruitless; and it is impossible not to admit that the fault was Luther's, and that he became aware of that only on his deathbed. As we are thus arrived at the deepest tragedy of Luther's life and of the history of Protestantism, and as we must endeavour, within the narrow limits of an article, to establish historical truth on these important points, as far as it is indispensable for a true and philosophical view of Luther's life, we think it unnecessary to prove that there were no mean passions at work in Luther's mind; but we will say shortly that it was the great tragedy of the Christian mind during more than one thousand years to which Luther paid now his tribute.

When Luther was raised above himself by the great problem before him, in that glorious period of action, from 1518 to 1524, he considered the sacraments altogether as a part of the services of the church, and a secondary point, in comparison with the right view of faith, or the inward Christianity which implies necessarily an unselfish, believing, and thankful mind. Having come to the conviction that there was no inherent virtue in the elements abstractedly from the communion, it was indifferent to him how the spirituality of the action and the real presence, even the transubstantiation, might be reconciled with that faith. But when he felt himself called upon at a later period to form a theory respecting the doctrine of the sacrament, he could never get free from the action of those two theological schools, the mystical German and the Latin scholastic, in the point where they combined. Thus, to his end Luther firmly believed that the act of the priest pronouncing the words, “This is my body,” produced a change in the elements, making them the body and blood of Christ, which he interpreted, however, as meaning the whole creature of Christ. Now, nothing was ever more historically erroneous. It has been shown elsewhere by the writer of this article, through an uninterrupted chain of documentary evidence of the very liturgies, from the second to the sixth century, that the recital of the words of the institution was nothing but the historical introduction to a prayer of blessing for the communicants. This prayer invoked the Spirit of God to descend upon the assembled worshipping congregation. The first step which unconsciously led to misunderstandings, was, that the blessing of God was also called down upon the elements in order to make the food prepared for the faithful the body and blood of Christ. The consecration, in other words, was not the recital of the words of institution, but a prayer, down to the time of Basilus, extemporized, or at least freely spoken, and always ending with the Lord's prayer. It is a tragical complication that the question as to what the elements became,—a question unknown and even unintelligible during the first five centuries,—should have entangled the mighty evangelical mind of the Reformer, whose appointed work was the destruction of the Romish system of delusion founded upon a total perversion of the fundamental Christian notions respecting sacrifice, priest, and atonement. It was this fatal ignorance of the oblation of the sound and organic, as well as the morbid Christian worship development, which blinded Luther to such a degree as not only to put a simply absurd interpretation upon the words of the institution, but to base the question of Christian communion between evangelical Christians upon the

same, instead of allowing it to be freely discussed as a scholastic question. When staking all upon what he called a literal interpretation of the words, “This is my body,” he ought to have acknowledged, at least, that others might as well take objection, if not to the absurdity of such a meaning, at least to the liberty which Luther claimed for himself at the same time, of making the body stand for the whole life contained in it, not to speak of the objection founded upon the words of institution as we find them in Luke and St Paul.

After these general observations, our historical relation of what remains to be told of Luther's life may be very short.

The first event was the conference of Marburg. The undaunted spirit of the landgrave, and the heroic self-devoted spirit of Zwingli, who accepted the invitation at the evident risk of his life, brought about that celebrated meeting on the first five days of October 1527. The frank and liberal declarations and concessions of the Swiss Reformers soon cleared away all shadows of difference and dissent, except that about the sacrament. In the half public disputation of the 2d of October, Zwingli embarrassed Luther by observing, that if the body of Christ was in the bread and wine, in any other than a spiritual sense, he must be present in a given place, by the very nature of matter, and not above matter, in heaven. Luther parried that stroke by saying,—“I do not mind its contradicting nature, provided it do not contradict the faith.” Still less could he disentangle himself from the words of Christ in the 6th chapter of St John, which Zwingli declared he could not discard, as it was a text and a clear one. Not more satisfactory was Luther's appeal to the fathers. The discussions of the four following days, however, resulted in recognising the point of difference, but reducing its expression to the mildest form, and placing it in the background, as compared with the full statement of the points on which both parties were united. Tears of joy filled all eyes; and Zwingli, with Œcolampadius and Bucer, returned satisfied, although the promised alliance between Germany and Switzerland was not concluded owing to Luther's reluctance. Zwingli had triumphed; his views became naturalized in Germany, where hitherto they were little known, and the dreadful words of Luther,—“Submit yourselves; believe as we do, or you cannot be acknowledged as Christians,” were forgotten. But no sooner had Luther returned to Wittenberg than he modified the articles in an exclusive sense, which necessarily shocked and alienated the Reformed party.

The issue of the conference at Marburg was a sad prelude to the great and decisive diet to be held at Augsburg in 1530,—the diet immortalized by the first confession of evangelical Christendom. All the appearances were changed; the elector, who, as well as the landgrave, went there in great pomp, was received by the emperor in the most flattering manner. All was to be peace and concord in Germany. Behind the scenes we see the emperor quieting his brother Ferdinand, the head of the Romish and fanatical party, who protested against such encouragement to heresy. He writes to him:—“I shall go on negotiating without concluding anything; fear nothing if I even should conclude; there will never be pretexts wanting to you to chastise the rebels, and you will find people enough too happy to offer you their power as a means of vengeance.”

Charles was an Austrian tyrant and a Spanish bigot, and a great politician of the Italian school, which has procured him, even from historians of our time, the name of a great man. The only reason why he did not now follow the advice of the cardinal legate and the Spaniards, and of his own brother Ferdinand, was simply that he thought the good Germans would do the work of destruction themselves, and

Luther.
8. Conference between Luther and Zwingli at Marburg, Oct. 1527.

9. The diet of Augsburg and the Augsburg Confession of Faith, 1530.

Luther. that in the mean time he would have in them a check upon the pope. But in his own mind he was ready to sacrifice to the bigoted party all the constitutional rights of the diet, as he had sacrificed that wonderful republic of Florence to the Medici family at the request of the holy father, who (said Charles) could not demand anything wrong: of course, least of all in a case which regarded his own house!

The diet of Augsburg is the bright point in the life of the Elector John the Constant, as the conference of Marburg is in that of the landgrave. When the emperor's ministers, who preceded him at Augsburg, announced to the elector the emperor's intentions, in order to intimidate him, he said,—“If the emperor intends to stop the preaching of the gospel, I shall immediately betake myself to my home.” Luther had been left at Coburg, the nearest safe place for the proscribed, and was consulted daily. He told the elector he had no right to say so; “the emperor was his master, and Augsburg was an imperial town.” Grand and heroic, although erroneous, advice of the man whose life must have been the first sacrifice of a policy which the elector meant to resist! The lawyers, however, were here also in fault; their Byzantine notions of imperial rights made them timid in the application of the principles of the German constitution. The Protestant princes had a clear constitutional right to resist the emperor, standing upon the resolutions and the edict of Worms, and the solemn declaration of Spire. Melancthon himself thought they might maintain the right of preaching the gospel, only abstaining from any controversial point. But undoubtedly those were right who advised the elector to remain. As to the chief practical point, Chancellor Bruck confirmed the elector in his resolution not to allow the preaching of the gospel to be interdicted to him and his friends. As to alliances and leagues, the elector said,—“I have formed no secret alliances; but I will show those I have entered into if the others will show theirs.” In the meantime, Melancthon had by the middle of April prepared the articles of the confession with their defence, the so-called apology. Luther sat all the time in his solitary castle. “It is my Sinai,” he said, “where I lift up my hands to pray, as Moses did during the battle.” He worked at the Psalms and the prophets (he translated here Jeremiah and Ezekiel), and dedicated his hours of recreation to a popular edition of what was called *Æsop's Fables*, as Socrates did in his prison. “I am making a Zion out of this Sinai, and build there three tents, viz., one for the psalms, one for the prophets, one for *Æsop*,” a truly German saying, which the historian of the Reformation ought not to have censured. How could Luther endure his solitude in that tremendous crisis which, as far as the affairs of Germany were concerned, he saw in darker colours than anybody, unless he had some recreation of this kind. But besides, his object was to place his *Æsop* (which contains many compositions of his own) in the hands of the people, instead of a common popular book of the time, of the same title, of the lowest and most immoral description. It was also in this solitude that he wrote that admirable letter to his son Hans, with the description of the garden of wonders. While here he received the news of his father's death, which affected him deeply, so that his health began to give way, and his hallucinations, or waking dreams, recommenced. The news of the league between Charles V., Francis I., the Pope, and Venice, roused at times the political spirit which was in him. “I do not believe a word,” he said, “as to the reality of such a league. *Monsieur par ma foy!* (Francis) cannot forget the battle of Pavia; *Monsieur in nomine domini* (Clement VIII.) is, first, a Welsh (Italian), which is bad enough; secondly, a Florentine, which is worse; thirdly, a bastard, a child of the devil; and, fourthly, he will never forget the indignity of the plundering of Rome. The Venetians, finally, are Venetians, and they have reasons enough to hate the

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posterity of Maximilian. Poor Charles, he is like a sheep among wolves; God will save him!” There is the sound politician and the loyal German, hoping against hope, and trusting his prince's promises as long as he breathes! He wrote letters full of comfort to the elector, and at the same time addressed one of his most powerful writings to the clergy assembled in the diet at Augsburg, in which he shows them the absurdity of their system, and the unchristian spirit of their claims. The address concludes with the prophetic verse,—

“Pestis eram vivus; moriens ero mors tua Papa!”

[“O Pope, thy plague I was in life; in death I shall be thy destruction.”]

On the 4th of June Gattinara, the chancellor of Charles, died—an Italian, who most earnestly wished a real reform of the church; and the advocates of persecution got the upper hand. On the side of the Protestants, the Swiss party began to suspect Melancthon, and complained of the use of Latin chants and surplices in Saxony; while, on his side, Melancthon detested what he called the seditious principles and worldly reasoning of the Swiss. Soon afterwards, we see him ready to give up some of the essential points to the emperor, who, on his approach to Augsburg, said:—“What do the electors want? I shall do what I like.” Well had he learned in Spain the lessons of tyranny which Cardinal Ximenes knew so well to apply under Philip II. But he prayed four hours every day, so that the people said (as he scarcely ever spoke),—“He talks more with God than with men.” When in the conference with the Protestant princes, he demanded of them to cease from their present mode of worship, they declared that their conscience did not allow them to do so, and the margrave of Brandenburg, bowing down towards Charles, and putting his hands upon his neck, cried out,—“Rather than allow myself to be deprived of the Word of the Lord, and rather than deny my God, I will have my head cut off at your majesty's feet.” This startled the Spaniard. “Dear prince,” he exclaimed, “not the head, not the head!” Imprisonment will do, he thought all the while, and those incautious words betray that thought. This was all his Sacred Cæsarean Majesty deigned to utter during the diet. Great was his wrath when the princes declared indignantly that they would not consent to follow the procession of the host at the festivals of *Corpus Domini*. Why not worship a wafer which the priest has made God? And why not show this respect to the emperor and cardinal? asked Ferdinand. “We can and we will worship none but God,” they unanimously declared. Their worship went on, and the vast church of the Franciscans was always crowded; an eloquent Zwinglian preached powerful sermons from the book of Joshua about the people of Israel in the face of Canaan. Charles was furious; an insidious compromise was proposed; the emperor would name preachers who should simply read the epistles and gospel of the day, and the ordinary prayer of confession before the mass. The pusillanimity of Melancthon, and the legal opinions of some of the lawyers of the Protestant princes as to the emperor's power in an imperial town, overcame the repugnance of the elector. All the Protestant preachers left the place in dismay. The whole town was in consternation. “Our Lord God,” exclaimed the elector, “has received order to hold his tongue at the diet!” Luther all the while had been quiet, waiting in patience. But this was too much for him. “This is the first step,” he said, “to the demand that we give up our faith. We have to fight against the gates of hell.” “Keep up your courage,” he wrote to Melancthon, “for you are the ambassadors of a great King.” The elector and his theologians thought it justifiable that, in virtue of his office as grand marshal of the empire, he should bear before the emperor the sword of state, when the latter attended the mass of the

Luther.

Luther.

Holy Ghost at the opening of the diet, on which occasion an Italian archbishop preached a most fanatical and insulting sermon against the Germans, as being worse enemies of God than the Turks. In the imperial opening speech, Charles spoke of the lamentable dissensions which encroached upon the imperial majesty, and must produce sedition and murder. The Protestants were required to present their confession. The elector signed it first; four other princes and two cities after him, without any observation; the landgrave of Hesse, however, did not sign it without saying he did not agree as to the doctrine of the communion. The article says,—“That the body and blood of Christ are verily present, and are administered in the Lord's Supper to those who partake of it [and we disapprove those who teach otherwise].” The words in brackets were left out in later editions made during Luther's lifetime. On this occasion the princes took really the lead, and the whole was done as a great national, not as a sacerdotal work, in spite of poor Melancthon's scruples. This good man was indeed entirely out of his sphere, and lost his time, and committed the cause of Protestantism, by trying to bring about a compromise where there was no possibility of an honest understanding. In the mean time, Luther was left in complete and cruel ignorance of all that was going on; and when at last the letters of Melancthon arrived, they were full of fears and sad misgivings. During all this anxious time, Luther sought and found his comfort in constant prayer and occupation with the Word of God. “Where is Christ's church, if it is not with us? Faith alone is required. I will rather fall with Christ than stand with Cæsar.” Luther reprimanded Melancthon sharply for his pusillanimity, and some of his letters to him are addressed—“To Master Philip Kleinmuth” (pusillanimous).

After many tergiversations, the Protestants obtained their just demand; the confession, drawn up by Melancthon and approved by Luther, was read in public sitting on the 25th June 1530. A great day, worthy of the most glorious days of the apostolic times. Luther was not present; he was dead as a public man. But he lived in God, and for his faith and country. Nothing could damp his spirits. “I also have my diet,” he said; “and what lively discussions!”—referring playfully to the rooks which swarmed round his tower.

The emperor ordered the confession to be read in Latin. “No,” said the elector; “we are Germans, and on German ground. I hope, therefore, your majesty will allow us to speak German.” The emperor gave way, recollecting for the nonce he was in Germany, and that the Germans had a language of their own, and the strange fancy of using it even in theological affairs. When the chancellor of the elector had read the first part of that grand confession, which expounds the principles of the Reformation, and, in particular, the doctrine of justification by faith,—“that faith which is not the mere knowledge of a historical fact, but that which believes not only the history, but also the effect of that history upon the mind,”—there was an indescribable effect visibly produced upon the assembly. The opponents felt that there was a reality before them which they had never imagined; and others said, such a profession of faith by such princes was a more effectual preaching than that which had been stopped. “Christ,” exclaimed Jonas (Melancthon's companion), “is in the diet, and he does not keep silence: the Word of God is indeed not to be bound.” And forth these words have gone through a world wider than that to which the apostles preached. After a pause, the second part, the articles about the abuses of the church of Rome, was read and heard with profound silence by the mitred prelates of that church who were there assembled. As to the emperor, he slept during the whole of the reading, or seemed to sleep, like a tiger ready to espy the most convenient moment for leaping upon his prey. In the mean-

time, he calculated, undoubtedly, what political capital he could make of the Protestants against the pope. Luther.

Luther addressed a letter to the cardinal elector of Mainz, demanding nothing but one article, but insisting upon that unconditionally—the liberty of preaching the gospel. “Neither emperor,” he says, “nor pope has the right of forcing any one to believe.” With Melancthon and the other friends he insisted upon their leaving Augsburg immediately. “Home—home—home!” he exclaimed. “Might it please God that I should be immolated at this council, as John Huss was at Constance!” All the sayings of Luther during this crisis are sublime and of a truly prophetic character. He foresaw that now every effort would be made at Augsburg to destroy the principles of the Reformation by a treacherous compromise and a false peace. “The diet,” he said, “is a regular dramatic piece: first, there is the prologue, then the exposition, then the action,—now comes the catastrophe; but I think it will not be a tragic, but a comic end.” And, indeed, so it turned out to be, tragical as it was. The first triumphant effect of the confession soon passed away; the new converts, particularly among the prelates, withdrew; the fanatical party doubled its efforts, and Charles gave way to it, and aided its ends by all diplomatic artifices. Melancthon was caught. He entered into conferences in the vain hope they would lead to concord; he declared himself ready to maintain and obey the supreme authority of the pope, if he would, by an act of clemency, connive at, if not approve, some points which they could not change. During the treacherous conferences which now began, the emperor tried to intimidate the elector by threatening not to grant him the investiture, which the elector claimed, however, as his hereditary right as brother of his predecessor; and to frighten all the Protestant princes and the Protestant imperial city of Augsburg with measures of violence, by calling in the imperial troops, and keeping the gates closed. The landgrave escaped. This act caused dismay among the ranks of the Catholics, for a war could not be risked at this moment. The Romanists changed their tactics; they conceded, or rather feigned to concede; for, meanwhile, the pope had declared solemnly that he would not give up those very points. The Protestants acknowledged the jurisdiction of the bishops and the supremacy of the pope. A cry of indignation rose among the princes, and, above all, among the brave citizens of Augsburg. “Rather die with Jesus Christ,” they declared, “than conquer without Him the favour of the whole world.”

At this critical moment Luther's indignation rose to a holy wrath, like that of the prophets of old. “I understand,” said he to Melancthon, “that you have begun a marvellous work, namely, to make Luther and the pope agree together; but the pope will say that he will not, and Luther begs to be excused. Should you, however, after all, succeed in your affair, I will follow your example, and make an agreement between Christ and Belial. Take care that you give not up the justification by faith; that is the heel of the seed of the woman to crush the serpent's head. Take care not to acknowledge the jurisdiction of the bishops; they will soon take all. In short, all your negotiations have no chance of success unless the pope will renounce papacy. Now, mind, if you mean to shut up that glorious eagle, the gospel, in a sack, as sure as Christ lives, Luther will come to deliver that eagle with might.”

But Melancthon was changed: Luther's voice had lost its power over him. The extreme Protestant views maintained in a declaration which Zwingli had delivered to the emperor, disposed him to cling still more to Rome. All seemed for the moment lost; but Luther's faith had discerned the way in which God meant to save the Protestant cause, and had said,—“Christ lives; he who has vanquished the violence of our enemies, can also give us the power of

Luther. breaking through their artifices." The Romanists fortunately insisted upon four points,—celibacy, confession, the denial of the cup to the laity, and the retaining of private masses. This was too much: the conference separated. The Romanists now conceded the cup and the marriage of the priests; but they would not give up the private masses, nor the obligation of confession and penance for the remission of sin, and required an acknowledgment of the meritorious character of good works. Melancthon stood firm, on which the emperor and Clement played out their last card: an accumenical council should be convened; but, in the meantime, the Protestants should conform to the doctrine and rites of the Catholic church. Charles accompanied this communication with the most insulting threats against the Protestant princes, who declined to negotiate, and declared their resolution to abide by the *status quo* of Worms until the council should assemble. The emperor indeed went so far as to forbid the princes to quit Augsburg, but the elector was firm as a rock: his son left the town on the 12th of September. Melancthon had regained his courage and sagacity. When Luther heard what was taking place, he raised his voice from Coburg—"Depart, depart! even if it must be, with the curse of pope and emperor upon you. You have confessed Jesus Christ, you have offered peace, you have obeyed the emperor, you have supported insults of every kind, you have withstood blasphemies: now I will encourage you,—as one of the faithful members of Jesus Christ. He is making ready our enemies as victims for the sacrifice; he will presently consume their pride and deliver his people. Yes, he will bring us safely out of Babylon and her burning walls." When the emperor saw that the elector was resolved on departing, he communicated to the five princes and the six towns (four more having joined since Nuremberg and Reutlingen), a proposal for a recess, or definitive decree of the diet,—that six months' should elapse to give time for an arrangement; and meantime, Protestants and Catholics should unite in a common attack upon the Anabaptists and those who denied the holy sacrament, the Zwinglians; but the Protestants alike withstood threats and flatteries; and the elector took his leave, as he had announced, on the 23d of September.

9. Last 15 years of Luther's life, and his death—1530-1546.

The author of this article cannot agree with the saying of the eloquent historian of the Reformation, that if the glorification of man was the purpose and end of God's ways, and not God's glory alone, one must wish Luther had died at the Wartburg. We have seen that it was he who, in 1524, pacified Wittenberg and Saxony by his reappearance, and achieved wonders as a practical reformer; and, in 1525, attempted, as pacificator of Germany, what nobody but himself could and would have done. But whose was the never-shaken mind? Who among the German theologians and Reformers was the organ of God and of the German nation during the greater part of the momentous diet of Augsburg? Who else but the man in the solitary tower at Coburg! From this time forth, however, he had nothing left to do but to look the tragedy in the face, as a believer in God and His kingdom on earth, praying and preaching, and finally to die the death of a faithful and hopeful Christian saint. All the rest is patient, suffering, martyrdom.

Some of the most powerful Romanist princes, the archbishop of Mayence at their head, assured the elector, on his departure, that they would never join the emperor in adopting any violent measures against him, although the brother of the archbishop Joachim, elector of Brandenburg, had presumed to promise in their name that they would. Even Ferdinand said some civil words. But why? Simply because (as Charles could not refrain from saying in his wrath) the emperor was more than ever resolved to resort to arms. "Nothing but armaments will have any effect," he said. Indeed, he announced this as his resolution im-

mediately to the pope, and requested him to summon all Christian princes to assist him. The Catholic league was signed on the 13th of October. The anti-reformatory movement was begun in the town of Augsburg itself. The answer to this was the declaration of sixteen imperial towns, instead of six, that they would not grant any subsidies against the Turks so long as the affairs of Germany remained unsettled. The Zwinglian and Lutheran towns shook hands; and this was the expression of the real feeling of the whole German nation, only priests, pastors, and theologians excepted. The Protestant dignitaries declared that they rejected the imperial closing declaration, as the emperor had no right to command in matters of faith. Luther was the organ of the universal feeling of the German people, when he exclaimed, "Our enemies do not fill me with fear. I, on the contrary, shall put them down in the strength of the Lord. My life shall be their executioner; my death their hell." Indeed, his work was accomplished—for all countries and for all ages. The rest of his life was one long pang, although he did not live to see the most dreadful calamity,—the breaking out of the civil war of religion which began immediately after his death. He wrote an address to the German nation, warning them not to yield to Rome and not to trust any negotiations; "for," said he, "they know no argument but force. Be not deceived by their words about obedience to the church. The church is a poor erring sinner without Christ; not the church, but Christ is the faith." The cause of the Reformation made progress; the Protestant alliance, begun by the convention of Schmalkalden, gained new members; Denmark acceded, and Joachim II. became as staunch a defender of the faith of his mother as Joachim I. had been its violent enemy. As Luther had prophesied, the negotiations with the popish party in 1541, renewed at Ratisbon, led to no result. The emperor, at the diet of Spire in 1544, dared no longer refuse to the Protestants the equal right which they claimed. The Romish council opened at Trent in 1544, and its first proceeding was to read the pope's anathema against the Protestants.

It is in this latter period (from 1539 to 1543) that a secret letter of advice, drawn up by Melancthon, was given by Luther and his friends to the landgrave Philip in answer to his pressing request (sanctioned by the landgravine, who suffered from an incurable inward disorder) to deliver him from the sin of fornication, by allowing him to marry a lady of the landgravine's court. After the masterly discussion of this subject by Archdeacon Hare in his *Vindication of Luther*, republished (1555) from the notes to his *Mission of the Comforter*, it is not necessary, least of all to English readers, to enter into details in order to prove the report of Bossuet to be a tissue of falsehoods and malignity. We limit, therefore, ourselves to stating the decisive facts. *First*, The error committed in this secret advice by the Reformers was a perfectly sincere one; it arose from an indistinct view of the applicability of the patriarchal ordinances and of the Mosaic law, which admits a second wife legally, as indeed Moses himself seems to have had two wives at the same time. Now, as the Reformers could not show an express abrogation of those ordinances and of this law, they were led into this sad mistake. *Secondly*, There was in their advice no worldly regard whatever, as to any benefits and advantages, which might accrue to themselves, or to the cause of the Reformation. They knew that the landgrave had his whole heart in the cause of the Reformation, and had often risked his life and states for it. *Thirdly*, When in 1540, Philip divulged the secret, contrary to his promise, they spoke out and confessed their mistake, and Melancthon was brought by his grief to the verge of the grave. *Fourthly*, When, in the course of the controversy, Bucer published, in 1541, his pamphlet in defence of polygamy (under the name of Huldéric Neobulus), Luther pro-

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nounced his judgment upon the book and on the subject in the following solemn words:—"He who desires my judgment upon this book, let him hear. Thus says Dr Martin Luther on the book of Neobulus: He who follows this rogue and book, and thereupon takes more than one wife, and means that this should be a matter of right, may the devil bless his bath in the bottom of hell. This, God be praised, I well know how to maintain. . . Much less shall they establish the law, that a man may separate himself from his wife rightfully, when she has not already separated herself by open adultery, which this rogue would also like to teach." We possess also the sketch of his intended full reply to Bucer's book; and there we find the following sentence:—"We have already shown in a number of books, that the law of Moses does not concern us, and that we are not to look to the examples in the history of the saints, much less of the kings, to their faith, and to God's commandments."

The dark side of this latter portion of Luther's life is his controversy with the Reformed. He seemed now and then inclined to yield to their entreaties for a union, as is shown by his letter of 1531 to Bucer of Strasburg; and he declared his sincere wish for a union to the landgrave in 1534. He does not think the work ought to be precipitated, but he prays to live to see it take place. The concord of Wittenberg, begun by Bucer in 1536, which left it just possible to the Reformed not to see their view of the sacrament excluded, has his cordial sympathy. Finally, on the 17th February 1537, he writes to the burgomaster of Basel, James Meyer, in terms which excited among the Swiss the hope he would give up his exclusive views. But when Ecolampadius published the writings of Zwingle, after this great and holy man had died a patriot's death in the battle of Cappel, Luther became so incensed, that he wrote, in

1544, two years before his death, the most violent of all his sacramentary treatises,—*A Short Confession respecting the Lord's Supper*.

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However, his last word, on his deathbed, was one of peace. He is credibly reported to have said to Melancthon in the course of a dying conversation,—“Dear Philip, I confess to have gone too far in the affair of the sacrament.”

The year 1546 began with unmistakeable indications that Charles was now ready to strike a decisive blow.

Luther had been suffering much during the last few years, and he felt his end to be near at hand. In the month of January 1546, he undertook a journey to Eisleben in very inclement weather, in order to restore peace in the family of the counts of Mansfeld; he caught a violent cold; preached four times; and took all the time an active part in the work of conciliation. On the 17th of February he felt that his release was at hand; and at Eisleben, where he was born, he died, in faith and prayer, on the following day. Nothing can be more edifying than the scene presented by the last days of Luther, of which we have the most authentic and detailed accounts. When dying, he collected his last strength and offered up the following prayer:—"Heavenly Father, eternal, merciful God, thou hast revealed to me thy dear Son, our Lord Jesus Christ: Him I have taught—Him I have confessed—Him I love as my Saviour and Redeemer, whom the wicked persecute, dishonour, and reprove. Take my poor soul up to thee!" Then two of his friends put to him the solemn question,—“Reverend Father, do you die in Christ and in the doctrine you have constantly preached?” He answered by an audible and joyful “Yes;” and repeating the verse, “Father, into thy hands I commend my spirit,” he expired peaceably, without a struggle, on the 18th of February 1546, at four o'clock in the afternoon. (C. C. J. B.)

LUTHERANS, that body of Christians whose system of religious doctrine originated with Luther. They are more nearly allied to the Romanists in point of doctrine than are any of the churches of the Reformation. Luther maintained the doctrine of consubstantiation, or the real simultaneous coexistence of the body and blood with the bread and wine in the Lord's Supper. As to the use of ceremonies and forms, there is considerable license permitted among the Lutherans. They accordingly, differ much in the number and nature of their public rites. The general form of government in the Lutheran church is intermediate between the Episcopal and Presbyterian systems. From a misapplication of the doctrine that Christians are accountable to God alone for their religious sentiments, there is a considerable degree of liberty given to their teachers in relation to the symbolical books. These are the three ancient Creeds, the Augsburg Confession, the Articles of Smalcald, the larger and smaller Catechisms of Luther, and the Form of Concord. The fullest edition is that of Hase, by Francke, entitled *Libri Symbolici Ecc. Luther., cum Appendice Quinquepartita*, Leipsic, 1847. The Lutheran church prevails in Germany, Denmark, Norway, and Sweden. Their existence as a distinct body among the adherents of the Reformed cause dates strictly from the publication of the *Formula Concordiæ* in 1580. This act divided the church of Germany into Lutherans and Calvinists, and each of the two branches began from that time forward to have a separate history. Various efforts were made to heal this division, but in vain, until in 1817, when a somewhat mechanical union was effected on the basis of a declaration promulgated by a synod convened by royal authority at Berlin. Since that time the two confessions have been held within the pale of the same church, and not unfrequently been preached by collegiate ministers within the same walls; and in the perplexity of such virtual

disunion, many of the most gifted minds in Germany have addressed themselves to the task of finding some higher exposition of truth which shall include and combine the two phases of Reformed doctrine. This has led to a keen discussion in regard to the nature of the differentiating element in the two systems; and the simple enumeration of the formulas which Lutherans themselves have given, will tend to show the disturbing force which one anomalous doctrine has exercised in breaking up the common faith of the two great Reformers.

One scheme of difference points to the original dispute. As the first quarrel arose in regard to a passage of Scripture (and Lutheranism has developed itself in a long series of diverging exegetical systems), the disturbing force is traced to a fundamental difference in regard to the relation of reason to Scripture. The Reformed church is charged with exalting reason above the mysteries of revelation, which the Lutheran church receives in their simple and naked antagonism to the apprehensive powers of the human intellect. In this view the controversy between the Lutheran and Reformed systems is the same in kind, although not in intensity, as that which is waged between the Reformed party and the Church of Rome.

A second scheme points to a difference in original purpose. The Lutheran Reformation aimed at counteracting a Jewish element in Catholicism, and in this one-sided purpose unconsciously received a Gnosticizing tone; while the Calvinistic scheme, in combating a purely heathen element in the papacy, unconsciously fell, at least in its ethical creed, into a Judaizing cast of thought. Another formula defines the Lutheran church as the church of theologians, giving prominence to an objective theology, and the Calvinists as the church of collective believers, giving undue prominence to a subjective anthropology. In antagonism to this is another scheme, which defines Lutheranism as an anthro-

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pology with only a dwarfed theology, and Calvinism as a theology with a very defective doctrine of man. Calvinism severs God from the fallen creature; Lutheranism regards the creature as existing in God. Calvinism views salvation as a work of God, planned and executed utterly apart from man; Lutheranism, in asserting the resistibility of grace, recognises an element of human will in the redemption of each individual. Calvinism sees in the means of grace an efficacy imposed by God, and powerful only through faith; Lutheranism accords to them an innate power appreciable universally to man.

A brisker formula than any of the preceding defines Lutheranism as rooted in the absolute blessedness of intelligence to be developed, and Calvinism as founded on the absolute meritoriousness of fact to be appreciated. Another theory detects a fundamental difference in the doctrine of man's relation to God. The Lutheran sees the Creator immanent in the creature; the Calvinist recognises merely a relation of dependence. This leads to a different estimate of the world's history: Lutheran theology mingles in its doctrine of sin the conception of eternal love; the Reformed theology excludes everything but righteous law: Lutheran divines dwell on the traces of God's love in man's history; the Reformed systems dwell peculiarly on the unfolding of God's attributes.

It seems easier to apprehend that the difference lay in the relation of the two parties to tradition: Calvinism was systematized from Scripture alone; Lutheran theology accorded to tradition a regulative power. Calvinism was a return to the primitive sources of revelation; the Lutheran church was only a new phase of Latin Christianity. (Consult Göpel's *Eigenthümlichkeit der Luth. u. Reform. Kirche*, 1837; Ullmann's *Zur Charak. der Ref. Kirche in the Stud. und Krit.* for 1843; and Schneckenburger, *Vergleichende Darstellung des Luth. und Ref. Lehrbegriffs*, 1855.)

LUTON, a market-town of England, Bedfordshire, on the right bank of the Lea, 31 miles N.N.W. of London. It consists of three long irregular streets diverging from the market-place. The chief public edifice is the church, a fine old building of the Gothic and later English styles, containing a hexagonal font, and a number of interesting monuments. There are also a town-hall, a market-house, a literary and mechanics' institute, besides several chapels and schools. The inhabitants are principally employed in straw-hat making, brewing, and trading in agricultural produce. Market-day, Monday. Pop. (1851) 10,648.

LUTTERWORTH, a market-town of England, Leicestershire, on the Swift, an affluent of the Avon, 13 miles S. of Leicester. In the parish church, said to be erected about the beginning of the twelfth century, Wickliffe delivered his celebrated discourses. Market-day, Thursday. Pop. (1851) 2446.

LÜTZEN, a small town of Prussian Saxony, between Leipsic and Weissenfels, 11 miles W.S.W. of the former. It is celebrated as the scene of two important battles—one on the 6th November, 1632, between the Swedes under Gustavus Adolphus, and the Austrians under Wallenstein, when the former, though victorious, lost their gallant general; the other on the 2d May 1813, when the Prussian and Russian allied army was defeated by the French under Bonaparte. Pop. 1961.

LUXEMBURG, or LUXEMBOURG, a province of Belgium, in the basins of the Meuse and Moselle, formerly part of the grand duchy of Luxembourg, bounded on the N. by Liège, S. by France, E. by the duchy of Luxembourg, and W. by Namur. Its length from N. to S. is about 67 miles, and its breadth E. to W. 37 miles; area, 1705 square miles. It is traversed from S.W. to N.E. by a branch of the Ardennes, whose highest summits do not exceed 2000 feet. Its surface is extremely rugged, covered with wood and extensive morasses. The soil is nowhere

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very fertile, being thin and gravelly. About one-third of the unwooded surface is devoted to pasture—sheep, horned cattle, pigs, and horses being reared for export in great numbers. The latter especially are of a hardy and spirited race, and are bought for the light cavalry in France. There are considerable mines of iron, and lead and copper are also found; with marble, slate, freestone, marl, and gypsum. Besides iron, there are manufactures of cloth, tulle, earthenware, leather, nails, and potash. Of the soil, the principal productions are,—wheat, potatoes, tobacco, wine, and fruit. The most important article of commerce is the bark of the oak, which is employed in the great tanneries of Stavelot and Malmedy, and in England; and the oakwood itself, which is exported to Liège and the Netherlands by way of the Meuse. The province is divided, for administrative purposes, into five arrondissements—Arlon, Bastogne, La Marche, Neufchâteau, and Virton. Arlon, the capital, is a place of some size and importance; but on the whole, the province is thinly populated. In 1855 it amounted to 196,074. It sends two senators and five representatives to the Belgian legislature.

LUXEMBURG, *Grand Duchy of*, one of the states of the German Confederation, and part of the kingdom of the Netherlands, is bounded N. and E. by Rhenish Prussia, S. by France, and W. by Belgium. Its length from N. to S. is about 48 miles, and its breadth from E. to W. 34; area, 986 square miles. Its surface is elevated, being part of the plateau of the Ardennes, and largely covered with wood and heath. The River Moselle, which bounds it on the S.E., drains the greater part of it; and the Sure and its tributaries Our and Alzette, and the Meuse and its affluents Ourthe and Lesse, the remainder—the Sure itself falling into the Moselle. It is divided into three districts—that of Luxembourg, Grevenmacher, and Diekirch, containing eleven cantons; and, in 1855, a population of 189,480. The bulk of the population is employed in agriculture, which is rather in a backward state, the nature of the soil being adverse; and there is a considerable amount of pastoral country. Wine is grown to some extent, but it is of inferior quality. The chief agricultural products are corn, vegetables, hemp, flax, and hops. Iron is found in the eastern districts, and about 9000 tons are annually manufactured, wood being employed as fuel. The quarries of lime and slate are pretty extensive. Lead was also worked at one time, but is now exhausted or abandoned. The population of the whole of Luxembourg, including the Belgian province, with few exceptions, speak German, though French is understood. In religion they are, almost without exception, Roman Catholics. There was till lately a great want of schools and colleges, but a movement has taken place in this respect.

Luxembourg was originally governed by counts, who were at the same time sovereigns of Brandenburg. In 1354 it was erected into a duchy by Charles IV.; and in 1443 fell to Philip of Burgundy by marriage, and through Philip to the House of Spain, with whom it continued entire till, at the peace of the Pyrenees in 1659, part of it was ceded to France, and took the name of French Luxembourg. This latter portion is now comprised in the department of the Moselle. In the first revolution France again appropriated the whole; but in 1814 it was given to Holland in compensation for the German principalities of Nassau, Dillenburg, Siegen, Hadamar, and Dietz; and was organized by the King of the Netherlands as a foreign province, with a constitution and administration of its own. It was again dismembered in 1831, in consequence of disputes following on the Belgian revolution of 1830; and the portion W. of a line drawn from the French to the Prussian territory, a little to the E. of Arlon and Bastogne, given to Belgium.

LUXEMBURG (German, *Lützelburg*), capital of the old grand duchy, and now of the Dutch province, is situate

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in N. Lat. 49. 37., and E. Long. 6. 9.; 100 miles S.E. of Brussels, 66 S.S.E. of Liège, and 115 W.S.W. of Frankfurt-on-the-Main. As a fortress it belongs, by the treaty of Vienna, to the German Confederation, and is garrisoned with 6000 Prussian troops. Naturally strong, and carefully strengthened by its successive possessors, it is now, according to Carnot, the strongest place in Europe except Gibraltar, and the only *point d'appui* from which France can be attacked from the side of the Moselle. It consists of an upper and a lower town; the former being the citadel, and standing 200 feet higher than the latter, with which it communicates by flights of steps and zig-zag streets cut in the solid rock. The lower town occupies a deep valley, watered by the Peterburn and Alzette, crossed with fortifications, and divided into two quarters, viz., Grindel and Pfaffenthal, by the projecting rock called Le Bouc. This is the most remarkable part of the works; it is hollowed from top to bottom, commands the whole valley up and down, and its casemates, cut in the solid rock, are capable of holding 4000 men. The walls have been greatly strengthened under the direction of the German diet, and a new fort built outside the gate to Treves. The most remarkable buildings are the ancient cathedral, partly used as a barrack, and the governor's house. The town possesses also four churches, three chapels, an atheneum, seminary for priests, a normal and several elementary schools, and a recently erected market-place. There are two convents, the Dominican and Franciscan, in a very ruinous condition. The chief manufactures are of wax and leather (common and chamois); there are also breweries and distilleries. The commerce consists of gold and silver goods, paper, iron, wine, porcelain, and some other articles. Luxemburg is an episcopal see. Pop. about 12,000.

LUXEMBURG, FRANÇOIS HENRI DE MONTMORENCY, *Duke of*, and marshal of France, a renowned general in the service of Louis XIV., was born in 1628. He was with the Prince of Condé at the battle of Rocroi in 1643; and in 1688 he distinguished himself at the conquest of Franche Comté. In 1672 he commanded in chief the French army in Holland, when he defeated the enemy near Woerden and Bodegrave; and the retreat which he effected in 1673 was universally admired. He became marshal of France in 1675, gained the battle of Fleurs in 1690, that of Steenkirk in 1692, and that of Nerwinde in 1693. He died at Versailles in 1695.

LUXEUIL, a town and watering-place of France, department Haute-Saône, near the rivers Lanterne and Breuchin, 16 miles N.E. of Vesoul. It is situate at the extremity of a fertile plain, and is well laid out in substantially built streets, many of which are ornamented with fountains. The edifices of chief interest are,—the ecclesiastical college, formerly a Benedictine abbey, founded in the fourteenth century; the old town-hall, erected about the same time; and a mansion, once occupied by Cardinal Jouffroy. Besides these there is a large bath-house in the centre of a beautiful park, plentifully supplied with thermal spring water. The town has manufactures of ironmongery, straw hats, and brandy; and carries on a brisk trade in agricultural produce. It was celebrated for the efficacy of its waters in the time of the Romans, who erected baths here, of which the remains are still extant. In the sixth century an abbey was founded by St Colomban, which afterwards became one of the most famous in France. Pop. 4100.

LUXOR, or EL UKSUR, near Thebes. (See EGYPT.)

LUZON, or LUÇON, the largest of the Philippine Islands, in the Eastern Archipelago, lies between N. Lat. 12. 10. and 18. 43., E. Long. 119. 45. and 124. 10. In form it is very irregular, resembling in some measure a bent arm, and the coast is deeply indented with gulfs and bays. It consists of two peninsulas,—the northern called Luzonia, embracing four-fifths of the whole; and the southern, or Ca-

marines, running nearly at right angles with the other. These peninsulas are joined by the Isthmus of Tayabas, about 50 miles long, and varying in breadth from 10 to 20 miles. The length of the entire island is about 550 miles, and its breadth varies from 30 to 135 miles, excluding the isthmus; its area has been estimated at 52,328 square miles. The most remarkable bays on the western coast are those of Lingayen, Manilla, Balayen, and Batangas; on the eastern, those of Difun, Lamon, St Miguel, Lagonoy, and Albay. Like the other islands of the same group, it is of igneous formation, its basis chiefly granite; and like them it is traversed in its whole length from N. to S. by a range of mountains, the Caraballos, inclining chiefly to the eastern coast, to which they impart a bold and precipitous character; and branching in the northern peninsula towards the eastern and western extremities, Engaño and Bojeador. The branch which terminates in the promontory of Engaño is the highest in the island, and is called the Gran Cordillera, or Sierra Madré. The loftiest summit, however, in this range, called Banajao or Mujayjay, N. Lat. 14. 2., E. Long. 121. 14., is only 6214 feet above the sea, not more than half the height of the mountains of Sumatra and Java. These mountains are all of volcanic formation; and in the peninsula of Camarines some are still active volcanoes. From that of Mayon, in the province of Albay, N. Lat. 13. 14., E. Long. 123. 34., eruptions took place in 1766 and 1814,—the town of Albay being entirely destroyed by the latter; and from the volcano in Lake Taal, about 1667 feet high, an eruption took place in 1754, which destroyed the town of Taal. These eruptions were accompanied by extensive earthquakes. The volcano of Balusan, in the S., serves as a kind of beacon, and is on that account well known to mariners. Lofty and extensive plains and valleys are inclosed by these ranges, the largest being those of Cagayan, Abra, and Agno in Luzonia. The island has numerous rivers and streams, the largest of which is the Cagayan, passing through the plain of that name, and known also as the Tajo (*Tagus*) and the Apari, navigable to a considerable distance for small vessels, and falling into the sea, after a course of about 200 miles, in the northern region at the town of Apari. Passing through the same plain, and falling into the sea farther W., is the Abulug. Into the Bay of Manilla fall the united waters of the Chico and the Grande, the former issuing from the Lake of Camaren. The united stream passes through the fertile province of Pampanga, and has a course of about 23 leagues. Two considerable rivers derive their names from the plains of Agno and Abra; the former rises in the Central Caraballos and falls into the Gulf of Lingayen; the latter rises in the Western Caraballos, Lat. 16. 47., and falls into the sea by three branches near the headland of Namagpacan. It is navigable for small vessels.

The most extensive lake in the Philippines is the Laguna de Bay, so called from the town of Bay at its S. extremity. It has an area of about 350 square miles, and an average depth of about 15 fathoms. Into this lake flow fifteen different rivers, and its surplus waters are carried off by the River Pasig, which falls into the Bay of Manilla near the city of that name, after a course of about 21 miles. This lake contains several islands, the largest of them, Talim, being 3 leagues in length by 1 in breadth. Its waters are everywhere potable, and it has valuable fisheries. The Pasig is navigable for vessels of 500 tons, and though not one of the largest, is the most important river of Luzon. After the Lago de Bay is the deep Lake Taal already mentioned, between Lat. 13. 52. and 14. 6., and which has a circumference of 15 leagues; then Lake Cagayan in the province of Cagayan, about 12 leagues in circumference; lastly, Lake Camaren, Lat. 15. 40., about 6 miles long and 5 broad in the dry season. There are also temporary lakes, called by the natives *Pinug*, caused by the rains, and which either entirely disappear or

Luzon.

Luzon. are much reduced in the dry season. The Pinag of Candava, in the province of Bulacan, 8 leagues broad sometimes during the rains, affords in the dry season rich and extensive pastures.

On the western side of the island the fall of rain is very great, the rainy season lasting from the middle of June to the middle of September; on the eastern, the rainy season sets in with the N.E. monsoon, which prevails from November to March; this difference is owing to the chain of the Caraballos. The N.W. monsoon prevails from April to October, the summer or dry season. The annual fall of rain at Manila ranges between 84 and 114 inches. It sometimes rains without intermission for a fortnight. During this season the rivers overflow their banks; lakes are formed; and, owing to the paucity of stone bridges and the frequent loss of the wooden ones, whose places are supplied with cane-rafts, inland communication is rendered extremely difficult. The heat at Manila at no time exceeds that of a Madrid summer, as those allege who have experienced both. The range of temperature in the former city is from 19° to 29° Reaumur.

The forests, with which the island is extensively covered, afford excellent timber for house and ship building; the dongon and molavé are considered by the Spaniards superior to the teak. The rice crops afford not only the principal food of the population, but a surplus for the Chinese market; maize and wheat have been introduced by the Spaniards. The yam (*ubi*) and the batata are the farinaceous roots cultivated. The banana, mango, pine-apple, orange, and musk melon, are abundant; the mango is said to be of peculiar excellence. The sugar-cane is grown; oil is procured from the sesame and cocoa-nut; and spigits from the buri and the nipa palm. Indigo, coffee, and cocoa are of comparatively recent introduction. Cotton and the piña, and abaca banana, afford materials for textile fabrics; the fibres of the latter, mixed with Chinese silk, form the cloth for which the island is famous. Tobacco is grown to some extent. The husbandry of Luzon, and the system of irrigation, notwithstanding the abundance of water, is by no means so perfect as in Java and some other islands of the Archipelago; but such is the productiveness of the soil that it ranks next to Java in point of fertility and population. Land is very valuable in Luzon, ranging from L.22 to L.125 per English acre—about ten times the usual value of land in tropical Asia; irrigated land being highest in price. The greatest portion of the cultivated land is divided among small proprietors; the larger holdings are farmed on the métairie system, half the produce being paid to the proprietor. The crown holds the uncultivated lands, and receives from pious foundations and the European settlers a nominal tithe, or quit-rent. Besides the lands under wood and cultivation, there are extensive plains, furnishing pasture for herds of horses, oxen, and buffaloes, none of which are indigenous, but nevertheless exist wild to an extent unknown in the rest of the Archipelago. Of the other wild animals the most remarkable are the mountain cat (*Gato de Montes*), the only animal of the feline tribe; the hog, the only pachyderm in the island; and the civet cat. The adjutant crane, the swallow which furnishes the edible nest, great numbers of the pigeon and parrot kind, and the common fowl in a wild state, are found. Serpents, alligators, and tortoises abound. The rivers, lakes, and surrounding ocean swarm with excellent fish, furnishing employment to a great part, and, with rice, the chief food of the whole of the population. Of fresh-water fish, the sabalo, taken in Lake Taal, whither it ascends from the sea for the purpose of spawning, and the dalag, are most esteemed. The tripang, a sea fish taken in the shallow bays, is cured, and forms an important item of export to China. The usual tropical insects infest the island; mosquitoes and ants are the special plagues; but the hurricanes to which it is exposed are an excellent protection against the locust.

Besides the civilized and savage Malayan races (the former inhabiting and cultivating the valleys, the latter subsisting by the chase among the mountains), the island contains tribes of Aetas, a race better known by the Spanish name Negritos, applied to them from their resemblance to the negro, without being so tall or so black. The Aetas, who are found only in the five larger Philippines, exist in the rudest possible manner, and are in a state of incessant hostility with the other islanders. The number of those in Luzon at all under control amounts to about 8300. The population of Luzon, which is very unequally distributed, was in 1850 computed at 2,534,613, having nearly tripled itself in the course of half a century.

The most considerable branch of industry is the weaving of cotton and the other fabrics already mentioned, for home use and exportation. This manufacture is most largely carried on in the provinces of Ilocas, Camarines, and Tondo. Some of the piña cloth made is extremely delicate and beautiful; and it is rendered more valuable by the exquisite embroidery of the native women. Their matting from the buri palm, and cordage from the coarser abaca, are much esteemed. The art of dyeing cloth is extremely imperfect; that of printing it quite unknown. The women are remarkably skilful in gold filagree work. Salt is made from sea water by boiling and by exposure to the sun, and from some plants by burning them. This manufacture is carried on in the province of Pangasinan, which also provides the neighbouring provinces with oil and sugar.

The coasting and inland trade of Luzon are attended with difficulties,—the former from the equinoctial hurricanes, and the monsoons themselves rendering only one voyage practicable to the native traders in six months; the latter from the rains and the condition in which they leave the roads. Manila is the central point; but there is a good deal of trade between the various provinces,—in rice from the more productive, in cotton from Ilocas, indigo from Bulacan and Laguna, piña and abaca fabrics from Camarines. Timber and canes are floated down the rivers in rafts. The foreign trade of the Philippines is confined by law to Manila,—the staple exports being rice, sugar, tobacco, coffee, indigo, hides, ebony, tortoise-shell, tripang, abaca hemp and cloth, hats, and gold dust. Wine is imported from Spain; cotton and woollen fabrics, iron and copper, from Great Britain; and silk from China. (See MANILLA.) For the China trade Luzon has peculiar facilities, the number of voyages not being restricted by the monsoons.

The name of the island is probably derived from that of the western promontory of the Bay of Manila, and that from its supposed resemblance to the mortar (*lozong*) used by the natives in husking rice. The Philippines were discovered by Magellan in 1521; but it was not till fifty years after that Legaspi landed in Manila Bay, where he found a thriving Mohammedan town. He found no great difficulty in subjugating the island. The people were little advanced in civilization, the use of fire-arms being almost unknown; and they were divided among themselves. Except some piratical expeditions from China and Japan, and some abortive attempts on the part of the Portuguese and Dutch, the Spaniards were left in undisputed possession of the island till the invasion by British troops from Madras in 1762. The armament consisted of thirteen men of war and a force of 2300 men. Manila was stormed and sacked, but restored by the treaty of Paris after ten months' occupation. (See PHILIPPINES.)

LYBIA, or LIBYA, a name anciently given to all that part of Africa lying between the borders of Egypt and the River Triton, and comprehending Cyrenaica, Marmarica, and the Regio Syrtica. (See AFRICA.)

LYCÆUM. (See ATHENS.)

LYCAON, a king of Arcadia, son of Pelasgus V. and Melibæa, or Cyllene. Some make him son of Hermes (Sch.

Lybia
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Lycæon.

Lycaonia
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Lycia.

ad Theocr. i. 124). It has been supposed by some that there are two distinct kings of the same name, but there seems no sufficient reason for such a supposition. He was the father of many sons; some say fifty, and others only twenty-two. According to the traditions of the Arcadians, he was the first who instituted the worship of Zeus as the Supreme Being, founding Lycosura upon the top of Mount Lycæus (Paus. viii. 2, § 1). He is said to have offered human victims on the altar of Zeus; and from this the poets embellished the story in the manner that Ovid tells it (Ovid, *Met.*, i. 198). Rumours of the impiety of Lycaon and his sons reached Jupiter, and he came down to examine their truth. They placed before him part of the body of a child dressed for dinner, when Lycaon and all his sons, with the exception of Nyctimus, were killed by Zeus with a flash of lightning, or, as others say, were changed into wolves (Tzet. *ad Lycoph.* 481; Eratosth., *Catast.* 8). Some say that the flood of Deucalion was the immediate consequence of the crimes of the sons of Lycaon (Apollodor. iii. 8, § 1).

LYCAONIA, a district of Asia Minor, was differently bounded at different times. Xenophon mentions it as extending westward from Cappadocia to the city of Iconium, which was afterwards situated near its centre. Under the sway of the Romans it suffered frequent dismemberments, and often changed its limits. According to Strabo, however, it was skirted on the N. by Galatia, on the E. by Cappadocia, on the S. by Mount Taurus, and on the W. by Pisidia and Phrygia. From the same author we learn that Lycaonia abounded in sheep and wild asses, and produced large quantities of salt. The chief towns were Iconium, Lystra, Derbe, Laodicea, Combusta, and Laranda. Daring and lawless, the Lycaonians were much addicted to war and rapine, and are first mentioned in history as resisting Cyrus the younger when passing through their country on his famous expedition. They set at defiance the power of the Persians; and though subdued successively by Alexander the Great, the Seleucidæ, Antiochus, Eumenes of Pergamus, and the Romans, they still preserved their nationality. In the Acts of the Apostles they are represented as having a language of their own.

LYCIA, a country of Asia Minor, was bounded on the W. by Caria, on the N. by Phrygia and Pisidia, and on the E. and S. by the Mediterranean Sea. From the account given by Herodotus, we may infer that the country was originally called Milyas, and was inhabited by two tribes, the Solymi and Tremilæ; or Termilæ, that a band of adventurers under Lycus, son of Pandion, drove the former tribe back to the northern mountains, and subdued the latter; and that, while the northern parts of the country still retained the ancient name of Milyas, the remaining parts were called Lycia, after the name of their conqueror. The northern part of Lycia is rendered rugged by offsets from Mount Taurus. The two principal rivers, the Limyrus in the E., and the Xanthus in the W., both flow southward into the Mediterranean. Pliny represents the country as fruitful, and noted for its firs, cedars, and plane trees. It appears to have been governed in the time of Homer by kings, but afterwards by a congress of deputies from the different free cities. By this congress, the chief magistrate, called Lyciarch, the judges, and other officials, were chosen, and the general affairs of the country administered. In the time of Strabo the free cities amounted to twenty-three. Of these, the principal were Xanthus, Patara, Olympus, Myra, Pinara, and Tlos. All these had three votes each in the decisions of the assembly. Of the remaining towns, some had two votes each, others only one. So productive of peace and good order was this constitution, that it was left in full operation by the Romans after they had subdued the country. Finally, however, it became disordered and incompetent, and was abolished by the Emperor Claudius. According to Herodotus, the Lycians had derived their

customs partly from the Cretans, and partly from the Lycomedes Carians; but differed from these nations as well as from all others in assuming the name of their mothers and not of their fathers.

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Lycon.

Recent discoveries have ascertained that the Lycians had an alphabet compounded of the Greek and some other character. Although possessing a language of their own, they seem also to have been intimate with that of the Greek, a circumstance that might be partly the result and partly the cause of their want of a national literature. The remains of their temples and richly ornamented tombs show, that in architecture and sculpture they were not far behind the Greeks.

At a very early period the Lycians seem to have waged a protracted warfare with the Solymi, the aborigines of the country; and to this struggle the legends of the Lycian hero Bellerophon, as related by Homer, bears reference. In the *Iliad* the Lycians are enumerated among the allies of the Trojans; and their two champions, Glaucus and Sarpedon, act a prominent part in the war. Strongly banded together by their excellent government, the towns of Lycia successfully repulsed the arms of Cræsus. Yet they were forced by Cyrus to submit to the yoke of the Persians, and are mentioned by Herodotus as contributing their contingent of fifty ships to the fleet of Xerxes. They succumbed after a slight resistance to the power of Alexander the Great; and after the dismemberment of the Macedonian empire, came successively under the sway of the Ptolemies, the Seleucidæ, and the Romans. Adopting the cause of Octavianus and Antony, they were subdued and severely taxed by Brutus. After the government of Lycia had been abolished by the Emperor Claudius, that country became part of the prefecture of Pamphylia. However, in the reign of Theodosius II., it was constituted a separate province. (See *A Journal written during an Excursion in Asia Minor*, London, 1839; and *An Account of Discoveries in Lycia, being a Journal kept during a Second Excursion in Asia Minor*, London, 1841, both by Sir C. Fellows.)

LYCOMEDES, king of the island Scyros, in the Ægean Sea, father of Deidamia, by whom Achilles had Pyrrhus or Neoptolemus. He was secretly entrusted with the care of young Achilles, whom his mother Thetis had disguised in female attire, to prevent him proceeding to the Trojan war, where she knew he must unavoidably perish (Apollodor. iii. 13, § 8; Sch. *ad Il.*, xix. 332). He treacherously slew Theseus to gain the favour of Menestheus, or dreading the influence of the strangers upon his own subjects (Pausan. i. 17, § 6).

LYCON, a philosopher of the school of Aristotle, was a native of Laodicea, in Phrygia. He was born B.C. 300, and died at the age of seventy-four, B.C. 226. Upon the death of Strato, Lycon became the head of the Aristotelian sect (B.C. 270), and taught the school at Athens which had been conducted successively by Aristotle, Theophrastus, and Strato, whom he succeeded. We are informed by Diogenes Laertius, in his life of this philosopher, that he was particularly successful in directing the studies of youth; and that he regarded corporal punishment as not only useless, but positively injurious, holding that youth ought to be directed by feelings of honour and shame, as a horse is by the spur and reins. His eloquence was full of mild persuasion, and so melodious, that his contemporaries prefixed the letter G to his name, making it Glycon, which signifies *sweetness*. He was much esteemed by Attalus and Eumenes I., kings of Pergamus; and Antiochus, King of Syria, did everything in his power to prevail on him to remain at his court. He conducted the school with great ability during upwards of forty-two years, and was succeeded by Aristo Ceus (Plut. *Mor.*, p. 605, B). The last will of Lycon is given by Diogenes, and exhibits a strong

Lycophron. proof of the kindness and goodness of his nature. It appears from Cicero (*Tusc. Disp.* iii. 32), that he wrote on the boundaries of good and evil. A work of his on the nature of animals is quoted by Apuleius.

LYCOPHRON, a Greek poet, was a native of Chalcis, a city in the island of Eubœa, and the son of Socles; but of his private history we are almost entirely ignorant. It is supposed that Lycophron began to be distinguished in the beginning of the reign of Philadelphus, B.C. 280, and continued to rise in reputation till B.C. 250, during the first years of the first Punic War, a period of thirty years. If we be correctly informed respecting the mode in which he acquired the friendship and favour of Ptolemy Philadelphus, who then held his court at Alexandria, it is not much to the credit of Lycophron. It is said that he owed it to the flattering compliments he contrived to convey to the prince through ingenious anagrams. Thus, from *Προλεμῖος*, he made *ἀπὸ μέλιτος* (of honey); in Arsinoë, the name of the queen, he found *ἰὸν ἑπας* (violet of Juno). Lycophron is included amongst those seven poets who from their number were called the Pleiad. They were all contemporary, and all graced the court of Philadelphus. Their names were Homerus, Sosithus, Lycophron, Alexander (*Ætolus*), Philiscus, Sosiphanes, or Dionysides, and *Æantides*. Lycophron was the author of sixty-four, or, according to others, of forty-six, tragedies (Tzetzes *ad Lyc.*, p. 270). Suidas gives the names of nineteen of them. They have all, however, disappeared, and the only fragment of them that has been preserved is a verse of four lines, quoted by Stobæus from his tragedy entitled *Pelopidæ*. The idea is beautiful, and is expressed with great simplicity. "The unhappy call upon death to relieve them while he is at a distance; but when the last moments of life approach, we are anxious to live. Man is never tired of life." Lycophron is also said to have been the author of satires. One of these, directed against Menedemus, in which he ridiculed the frugal table of this founder of the Eretrian school, has been particularly mentioned (*Athen.* x., p. 420; xi., p. 55). He also wrote some books on comedy; but the work which has been preserved, and for which he is best known, is entitled *Alexandra*, or *Cassandra*, from the daughter of Priam, who had two appellations, like her brother Paris. The poem consists of 1474 lines. Cassandra had acquired by a trick the power of prophecy from Apollo; but having refused to fulfil her engagement, the god prevented any credit being attached to her words, and caused her to be regarded as mad. She is shut up in a tower by Priam, that she may not alarm the city, and from the summit of the tower she observes the vessel depart which bore Paris to the shores of Greece. This spectacle excites her prophetic powers, and a servant who overhears her words repeats them to Priam. She commences by deploring the fate which she foresees must inevitably overtake her native city, and then proceeds to foretell the various calamities which will arise out of the Trojan War. She first recounts those which will befall Helen, her parents, brothers, and sisters; and then notices the fates of the different Grecian leaders, such as Ajax, Diomedes, Menelaus, Agamemnon, and Idomeneus. This causes her to refer to the numerous wars which had been carried on at various times between the inhabitants of Europe and Asia. She begins with the rape of Io and Europa, and, giving an historical sketch of the Argonauts, the Amazons, the Trojans, Midas, and Xerxes, she brings down her history to the time of Alexander the Great. Besides, there are many episodes scattered throughout the work, such as the Labours of Hercules, the Deluge of Deucalion, the Wanderings of *Æneas*, and the colony planted in Latium. This work of Lycophron is one of the most obscure which antiquity has handed down to us, and it appears that the author exerted all his ingenuity to render it so. He has succeeded principally by the employment

of unusual modes of syntax, of rare and obsolete words, of expressions far removed from the common dialect, of confused metaphors, and of periods so involved that the reader loses himself in a labyrinth of words. Of the many commentaries on the *Alexandra*, the only one extant is that by Tzetzes. The best edition is that of Potter (Oxford, 1697, 1702), in which the text is accompanied by the scholia of Tzetzes, the remarks of Canter and Meursius, and a valuable index. Reichard (Leips., 1788), rejecting the commentaries of Tzetzes, Meursius, and Potter, published the simple text and notes of Canter, adding a continued paraphrase like that which is found in the editions of the classics *ad usum Delphini*. The scholia have been published separately by Müller (3 vols. Leips., 1811). The best edition, with the smaller scholia, a paraphrase, Latin translation, and commentary, is that of L. Bachmann (Leips., 1830).

LYCURGUS, a celebrated lawgiver of Sparta, who established a constitution for his country which has ever been regarded as one of the most curious specimens of legislation that has been attempted to be imposed upon mankind; yet we have no certain information respecting Lycurgus, and even his very existence has been denied. It has been supposed by some that there were several of the same name, and, as in the case of Hercules, that the proceedings of all of them were ascribed to one individual. Believing in the existence of an individual of this name, we shall proceed to narrate those facts in his history respecting which writers are most fully agreed. He seems to have flourished about 884 B.C., if we follow the chronology of Eratosthenes, who placed him 108 years before the first Olympiad (Eratosth. *ap. Clem. Alex. Strom.* i., p. 336, ed. Colon.). He was the son of Eunomus, King of Sparta, and was of the race of the Heracidae. On the death of his father, Polydectes his brother succeeded, and reigned nine years, and on his death the general voice of the people called Lycurgus to the throne. As soon as it appeared that his brother's widow was pregnant, he declared that the kingdom must belong to her issue, provided it were male, and that he should consider himself only as regent till the result was known. The queen made a private offer to him that she would destroy the child if he would consent to marry her. Lycurgus, concealing the horror he felt for her wickedness, and wishing to prevent the execution of her intention, allowed her to imagine that he approved of her scheme. He prevailed on her to send the child to him as soon as it was born that he might see it destroyed, but, instead of acting as the queen had expected, he presented it to the people as their new-born king. Thus the reign of Lycurgus lasted only eight months. Though Lycurgus was much beloved by his fellow-citizens, still there were many who envied him, and more particularly the friends and relations of the queen-mother. He began to feel his position so uncomfortable, that he determined to leave his country till his nephew Charilaus should be of age. During his voluntary exile he visited the island of Crete, where he examined the forms of government established by Minos; he travelled through Asia Minor and Egypt, observing everywhere the peculiar laws of the country, and conversing with the most illustrious personages. It was during one of those journeys through the Ionian cities that he met with Homer's poems, and being charmed with the sound morality which pervaded them, no less than with the beauty of the poetry, he is said to have collected them into one volume, and to have transmitted the work to Sparta. After an absence of eighteen years, his countrymen prevailed on Lycurgus to return home, where he found the city a prey to anarchy, the authority of the magistrates disregarded, and everything tending to a dissolution of all the bonds of society. He had been so charmed with the form of government he had found established in Crete, that he resolved to introduce it into Sparta; but he did not succeed without much opposi-

Lycurgus
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Lydgate.

tion, and exciting many popular tumults. It seems difficult to imagine how he contrived to obtain their consent, as the laws must have been particularly burdensome to those who had been hitherto accustomed to a different form of life. He violated all the rights of private property, and seizing upon the land, divided it into equal portions among the inhabitants. He at the same time stopped the currency of gold and silver, and allowed nothing but iron moneys. The inhabitants were obliged to eat at a public table, and he took care that their food should be of the most frugal kind. The children were educated together without regard to rank, and the chief object of their education was to make them obedient to command, to endure labour, to fight, and to conquer. After he had instituted these laws, he made the people swear to observe them till he should return, and left his country for ever. (For an account of the legislation of Lycurgus, see SPARTA.)

LYCURGUS, one of the most celebrated orators of Greece, was born at Athens about the year B.C. 400, and died about B.C. 323. He was son of Lycophron, and grandson of Lycurgus, one or other of whom was put to death by the Thirty Tyrants, B.C. 404 (Phot. *Cod.* cclxviii, p. 1483). In his early years he studied philosophy under Plato, and the political constitution of his country under Isocrates. At what period he entered upon public life is nowhere recorded, but we find him, B.C. 343, appointed, along with Demosthenes, one of the ambassadors to counteract the proceedings of Philip in different parts of Greece (Demosth. *Philipp.* iii, p. 129). So much confidence had his fellow-citizens in his integrity, that he continued to preside over the collection of the public revenue for twelve or fifteen years. After the defeat of the Greeks at the battle of Chæronea, B.C. 338, he brought Lysicles, the general of the Athenians on that occasion, to trial before the people, and procured his condemnation (Diodor. Sicul. xvi. 88). He restored the credit of comic exhibitions at the Lenæan festival, and enacted honours for the three great tragic poets (*Vita Decem Or.*, p. 841). Lycurgus was one of the orators demanded by Alexander after the destruction of Thebes, B.C. 335; but the Athenians refused to give him up (Plut. *Demosth.* c. 23; Arrian, *Exp.* i. 10). It would appear that Lycurgus died about the time of the exile of Demosthenes, B.C. 323, the year before that orator's death (*Vita Decem Or.*, p. 842). There were fifteen orations of Lycurgus extant in the time of Plutarch and Photius, but only one has been preserved (against Leocrates), which was delivered B.C. 330. It is published by Hauptmann (Leips., 1751), by Schulze (Bruns, 1789), by Osann (Jena, 1821), and, along with other fragments, by Bekker (Magdeb., 1821). The best editions are those of Baiter and Sauppe (Turici, 8vo, 1834), and E. Maetznar (Berlin, 8vo, 1836).

LYDGATE, JOHN, an English poet, one of the immediate successors of Chaucer, assumed as his surname the name of his native place in Suffolk. The date of his birth is unknown; but it has been ascertained that he entered the Benedictine Abbey of Bury St Edmunds, and was ordained a subdeacon in 1389, a deacon in 1393, and a priest in 1397. He had begun to write before the death of Chaucer in 1400; and, according to Warton, seems to have reached the acme of his fame in 1430. After a short attendance at the university of Oxford, he had travelled into France and Italy, and had acquired an intimacy with the language and literature of those countries. With his taste thus improved, he opened a school for the instruction of the sons of the nobility in the arts of composition, both prose and metrical. He died at some period before 1461. To his excellence as a poet, and his proficiency in polite learning, Lydgate added a knowledge of geometry, astronomy, and theology. His genius was as many-sided as his erudition. With equal facility he delineates the *London Lickpenny* and the *Luffe of our Lady*, the religious aus-

Lydia.

terity of St Austin and the heroic deeds of Guy of Warwick. "If a disguising was intended," says Warton, "by the Company of Goldsmiths, a mask before his majesty at Eltham, a May-game for the sheriffs and aldermen of London, a mumming before the lord mayor, a procession of pageants from the creation for the festival of Corpus Christi, or a carol for the coronation, Lydgate was consulted and gave the poetry." This ease in composition, however, was often purchased by a lameness in prosody, and a want of precision both in thought and expression. He has not the original invention and the vivid representation of his master Chaucer, whom he was so anxious to rival. Yet in many of his descriptions of scenery we find a melody of rhythm, and a sweetness of fancy, which entitle him to the name of an improver of English versification.

A complete catalogue of Lydgate's voluminous works is given in Ritson's *Bibliographia Poetica*. His principal poems are three. *The Fall of Princes*, printed by Pynson in 1494, is a paraphrase of a French translation of Boccaccio's *De Casibus Virorum*. The princes are introduced dramatically to narrate their own mishaps; and, accordingly, the poem was not inaptly styled in the first edition, *The Tragedies gathered by John Bochas of all such Princes as fell from their estates since the Creucion of Adam*, &c. His *Storie of Thebes*, first printed by Thynne in 1561, at the end of Chaucer's works, is an additional Canterbury tale, in which the classical story of the sons of Œdipus is told with all the circumstances and machinery of romance. In a similar manner is the Trojan War treated in his *Troye-Boke*, printed in 1513 by command of Henry VIII. This poem is professedly a translation or paraphrase of the *Historia Trojana* of Guido de Colonna. The *Minor Poems of Dan John Lydgate*, edited by Halliwell, were published by the Percy Society, 1840.

LYDIA, in *Ancient Geography*, a celebrated kingdom of Asia Minor. The ancient writers inform us that Lydia was first called *Mæonia*, or *Meonia*, from Meon, King of Phrygia and Lydia; and that it was known under no other denomination until the reign of Atys, when it began to be called *Lydia*, from his son Lydus. Though Lydia and Mæonia are by most authors indifferently used for one and the same country, yet they are sometimes distinguished; that part including Mount Tmolus, and watered by the Pactolus, being properly called *Mæonia*; and the other, situate upon the coast, *Lydia*. This distinction is observed by Homer, Callimachus, Dionysius, and other ancient writers. In after ages, when the Ionians, who had planted a colony on the coast of the Ægean Sea, began to gain influence, that part was called *Ionia*, and the name of *Lydia* given to the ancient Mæonia. Lydia, according to Pliny, Ptolemy, and other ancient geographers, was bounded by Mysia Major on the N., by Caria on the S., by Phrygia Major on the E., and by Ionia on the W., and was situate between the 37th and 39th degrees of N. latitude. But what the ancients style the kingdom of *Lydia* was not confined within these narrow boundaries; it extended from Halys to the Ægean Sea. Pliny's description includes *Æolia*, situate between the Hæmus and the Caicus.

Some of the ancients conceive the Lydians to have been a mixed colony of Phrygians, Mysians, and Carians; but others, finding some conformity in religion and religious ceremonies between the Egyptians and Tuscans, who were a Lydian colony, conclude, without further evidence, that they were originally Egyptians. All we know for certain is, that the Lydians were a very ancient nation; and this is manifest from their fables; for Atys, Tantalus, Pelops, Niobe, and Arachne, are all said to have been the children of Lydus. Zanthus, in his *Lydiaca*, quoted by Stephanus, informs us, that the ancient city of Ascalon, one of the five satrapies of the Philistines, mentioned in the books of

Lydia. Joshua and the Judges, was built by one Ascalus, a Lydian, whom Achiamus, King of Lydia, had appointed to command a body of troops which he sent into Syria, we know not on what occasion. The Heraclidæ, or Kings of Lydia descended from Hercules, began to reign before the Trojan War, and had been preceded by a long line of sovereigns sprung from Atys, and hence styled *Atyadæ*—a strong proof of the antiquity of that kingdom.

The Lydians began very early to be governed by kings, whose authority seems to have been despotic, and the crown hereditary. We read of three distinct races of kings reigning over Lydia,—the *Atyadæ*, the *Heraclidæ*, and the *Mermnadæ*. The *Atyadæ* were so called from Atys the son of Cotys, and grandson of Manes, the first Lydian king. But the history of this family is obscure and fabulous. The *Atyadæ* were succeeded by the *Heraclidæ*, or the descendants of Hercules. This hero having, by the direction of the oracle, been sold as a slave to Omphale, Queen of Lydia, in order to expiate the murder of Iphitus, had by one of her slaves, during his captivity, a son named Cleolaus, whose grandson Argon was the first of the *Heraclidæ* who ascended the throne of Lydia. This race is said to have reigned 505 years, the son succeeding the father for twenty-two generations. They began to reign about the time of the Trojan War. The last of the family was the unhappy Candaules, who lost both his life and kingdom by his imprudence. Of this event an account is given by Herodotus. Candaules had a wife whom he passionately loved, and believed to be the most beautiful of her sex. He extolled her charms to Gyges, his favourite, whom he used to intrust with his most important affairs; and to convince him the more of her beauty, resolved to show her to him quite undressed. Enraged at this wanton affront, she told Gyges that he must either by his death atone for the criminal action he had been guilty of, or put to death Candaules, the contriver of it, and receive both her and the kingdom of Lydia as his reward. Gyges chose the latter alternative, and having stabbed the king whilst he was asleep, married the queen, and took possession of the kingdom, in which he was confirmed by the response of the oracle of Delphi. Candaules is said to have purchased, for its weight in gold, a picture painted by Bularchas, representing a battle of the Magnates; a circumstance which shows how early the art of painting had begun to be appreciated in that country, Candaules having been contemporary with Romulus.

Gyges having thus possessed himself of the kingdom of Lydia, sent many rich and valuable presents to the oracle of Delphos, amongst which were six cups of gold, weighing thirty talents, and greatly esteemed for the workmanship. He made war upon Miletus and Smyrna, took the city of Colophon, and subdued the whole country of Troas. In his reign, and by his permission, the city of Abydus was built by the Milesians. Plutarch and other writers give a different account of his accession to the crown of Lydia, and inform us, without making any mention of the queen, that Gyges rebelled against Candaules, and slew him in an engagement. In Gyges commenced the third race called *Mermnadæ*, who were also, properly speaking, *Heraclidæ*, being descended from a son of Hercules by Omphale.

Gyges reigned thirty-eight years, and was succeeded on the throne by his son Ardyes, who possessed himself of Priene, and of Sardis the metropolis of Lydia, and after reigning forty-nine years, was succeeded by his son Sadyattes, who reigned twelve years, during most part of which he carried on war with the Milesians.

After him came his son Alyattes, who, for the space of five years, continued the war which his father had begun against the Milesians, ravaging their country, and about harvest-time yearly carrying away all their corn; when having on one occasion set fire to the corn in the fields,

the flames were carried by a violent wind, which happened at that time to blow, to the temple of Minerva at Assesus, and burned it down to the ground. Not long afterwards, Alyattes falling sick, sent to consult the oracle at Delphos; but the god refused to return any answer until the king should rebuild the temple of Minerva at Assesus. Alyattes, thus warned, despatched ambassadors to Miletus, enjoining them to conclude a truce with the Milesians until the temple should be rebuilt. On the arrival of the ambassadors, Thrasybulus, then King of Miletus, having commanded all the corn which was at that time in the city to be brought into the market-place, ordered the citizens to banquet in public, and to revel as if the city were plentifully stored with all manner of provisions. This stratagem Thrasybulus practised that the ambassadors, seeing such quantities of corn, and the people everywhere diverting themselves, might acquaint their master with his affluence, and thus divert him from pursuing the war. As Thrasybulus had intended, so it happened. Alyattes, who believed the Milesians greatly distressed for provisions, receiving a different account from his ambassadors, changed the truce into a lasting peace, and ever afterwards lived in amity and friendship with Thrasybulus and the Milesians.

After a reign of fifty-seven years, he was succeeded by his son Cræsus, whose uninterrupted prosperity, in the first years of his reign, far eclipsed the glory of his predecessors. He was the first who made war on the Ephesians, whose city he besieged and took, notwithstanding their consecrating it to Diana, and their fastening the walls by a rope to her temple, which was seven stadia from the city. After the reduction of Ephesus, he, under various pretences, attacked the Ionians and Æolians, obliging them, and all the other Greek states of Asia, to pay him an annual tribute. Having met with such extraordinary success by land, the Lydian prince determined to render his power equally conspicuous by sea. For this purpose he had serious thoughts of equipping a fleet, with which he purposed to invade and conquer the Grecian islands directly opposite to his dominions. But this design, which, considering the slow progress of maritime power amongst the nations most diligent in attaining it, would probably have failed of success, was prevented by the advice of a philosophical traveller, conveyed in such a lively turn of wit as easily changed the resolution of the king. Bias of Priene, in Ionia (some say Pittacus of Mitylene, in the Isle of Lesbos), whilst he travelled, after the Grecian custom, from curiosity and a love of knowledge, was presented to Cræsus at the Lydian court; and being asked by that prince what news he brought from Greece, answered with a republican freedom, that the islanders had collected powerful squadrons of cavalry with an intention of invading Lydia. "May the gods grant," said Cræsus, "that the Greeks, who are unacquainted with horsemanship, should attack the disciplined valour of the Lydian cavalry; there would speedily be an end to the contest." "In the same manner," replied Bias, "as if the Lydians, who are totally unexperienced in naval affairs, should invade the Grecians by sea." Struck by the acuteness of this unexpected observation, Cræsus desisted from his intended expedition against the islands; and, instead of employing new means for extending his conquests, determined peaceably to enjoy the laurels he had won, and to display the grandeur he had attained. But his happiness was soon afterwards allayed by the death of his favourite son Atys, who was unfortunately killed in the chase of a wild boar. This loss rendered him disconsolate for two years, and reduced him to a state of inaction till the conquests of Cyrus and the growing power of the Persians roused up his martial spirit, and diverted his mind to other thoughts.

Cræsus apprehending that the success which had attended Cyrus in all his undertakings might at last prove dangerous

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nine assassinations in a single year in a town of Virginia with 3000 inhabitants. There have been frequent instances, especially in the southern states of the Union, of violent outbreaks of popular revenge, under the form of lynch law, against the advocates, real or supposed, of the abolition of slavery. (See Miss Martineau's *Society in America*.)

LYNN, or LYNN-REGIS, a seaport and parliamentary and municipal borough of England, in the county of Norfolk, is situate on the Ouse, about 40 miles W.N.W. from Norwich. The town is well lighted and paved, has three principal streets running parallel to the river, and is traversed by four small streams called "fleets." It has an old guildhall, an exchange and custom-house, a borough jail, a theatre, several schools, a young men's institute, hospitals, alms-houses, and a market-cross 70 feet in height. The principal market-place is spacious, and inclosed by good houses. St Margaret's church, a cruciform structure, founded in 1100 is partly of the early English style, and is especially rich in monumental brasses. The chapel of St Nicholas, built by Edward III., has a fine timber roof and a rich south porch. There are also the church of All Saints, St John's church, and several meeting-houses of Independents, Baptists, and Wesleyan Methodists. Thoresby's grammar-school, founded about 1500, has six exhibitions for Cambridge University. Ship-building, rope-making, shrimp and other fisheries, engage a great part of the population. The harbour of Lynn is capable of containing about 300 sail; but the long channel which connects it with the sea is often obstructed by shifting sands. Agricultural produce, and a fine white sand used in the manufacture of glass, are exported. The imports are chiefly wine from France, Spain, and Portugal; and hemp, wood, and flax from the Baltic. The number and tonnage of vessels registered at Lynn on 31st December 1855 were as follows:—Sailing vessels of and under 50 tons, 56; tonnage, 1832: above 50 tons, 110; tonnage, 16,253. Steam-vessels of and under 50 tons, 2; tonnage, 26; above 50 tons, 1; tonnage, 256. In the coasting trade, during 1855, there entered the port 1260 sailing vessels, of 109,898 tons; and 49 steam-vessels, of 5433 tons: and there cleared out 397 sailing vessels, of 23,100 tons; and 49 steam-vessels, of 5433 tons. In the colonial trade, during the same year, there cleared out 1 British vessel of 225 tons. For 1855 the reports concerning the foreign trade were,—inwards, 61 British vessels, 7003 tonnage; 85 foreign vessels, 6084 tonnage;—outwards, 25 British vessels, 2250 tonnage; 13 foreign vessels, 990 tonnage. Lynn is supposed to have existed in the time of the Romans. Formerly a fief of the bishops of Norwich, and called, on that account, *Lynn Episcopi*, it was emancipated by Henry VIII., and at the same time received its present name. Remains of the old fosse and wall are still seen. On the east side of the town stands Red Mount chapel, octagonal without, but cruciform within. There is also the beautiful hexagonal steeple of Greyfriars, 90 feet in height, supported by groined arches, and serving as a landmark to ships entering the harbour. Lynn is governed by 1 mayor, 6 aldermen, and 18 councillors. Ever since the time of Edward I., it has returned 2 members to parliament. Pop. (1851) 19,355.

LYNN, a seaport-town of the United States of North America, Essex county, Massachusetts, on the N.E. shore of Massachusetts Bay, near the mouth of Saugus River, 9 miles N.E. of Boston; N. Lat. 42. 28., W. Long. 70. 56. It is regularly laid out on a gentle eminence rising gradually from the shore, and is environed by beautifully wooded heights. The streets are generally long, and many of them are ornamented with rows of trees. The chief public buildings are,—the town-house, the lyceum, and many churches and schools. There is also a natural history institution, with a library and museum. Lynn has be-

come famous as the principal seat of the boot and shoe manufacture in New England, which has increased here very rapidly. During the year ending June 1855, there were made in Lynn 3,274,893 pairs of boots, and 6,000,700 pairs of shoes; the manufacture employing 6476 females, and 4545 males, or nearly three-fourths of the whole population. Lynn and its neighbourhood are much resorted to by sea-bathers and pleasure parties from Boston. It was founded in 1629, and incorporated as a city in 1850. Pop. (1845) 9367, (1855) 15,800.

LYON KING-AT-ARMS. This office is of great antiquity and respect in Scotland; and although the precise date of its institution is unknown, yet it must have been as early as the introduction of armorial figures as hereditary marks of gentility and distinction into this country, which was in the twelfth century. (For a history and description of the Lord Lyon's court, see the article *HERALD*.) The regalia of this officer are,—a crown of gold, with a crimson velvet cap, a gold tassel, and an ermine lining; a velvet robe reaching to his feet, with the arms of the kingdom embroidered thereon, before and behind, in the proper tinctures; a triple row of gold chains round his neck, with an oval gold medal pendant thereto, on one side of which is the royal bearing, and on the other St Andrew with his cross enamelled in proper colours, and a baton of gold enamelled green, powdered with the badges of the kingdom. On solemn occasions the Lord Lyon wears the regalia above described; at all other times he wears the oval gold medal or badge on his breast, suspended by a broad green ribbon.

LYON, GEORGE FRANCIS, was born at Chichester, in Sussex, in 1795. He was scarcely thirteen when he entered the navy, and in 1816 he joined Lord Exmouth's squadron for the bombardment of Algiers. At Malta, Lyon was prevailed upon by the traveller Ritchie to accompany him on an expedition to North Africa. Lyon reached the port of Tripoli on the 25th November 1818, and spent the greater part of the two following years in making explorations in Soudan, the course of the Niger, &c. Ritchie died, and Lyon was compelled to return to England on the 29th July 1820, when he published an account of his expedition. Next year Lyon got the command of the *Hecla*, and in concert with Captain Parry of the *Fury*, set out on a voyage of discovery to Hudson's Bay. They returned in 1823; and an account of this expedition was published at London in 1824. Lyon made an unsuccessful voyage next with the *Griper* to Repulse Bay, of which he gave an account in 1825. The rest of his life was spent chiefly in a survey of the mines of Mexico. He died in 1832.

LYONNET, PETER, an ingenious naturalist, descended from an ancient family of Lorraine, was born at Maestricht in 1707. At school he showed a singular aptitude for languages, and in a short time became an adept in Latin, Greek, Hebrew, French, Italian, Spanish, German, and English. His father, a minister of the French church at Heusden, had designed him for a clergyman, and accordingly with that view Lyonnet entered the university of Leyden. There, in addition to the prescribed subjects, he studied anatomy, music, drawing, and sculpture. Abandoning all intention of entering the church, he soon afterwards applied himself to law; and after he had graduated at Utrecht, practised for some time at the Hague. He then began to study deciphering, and in a short time was appointed secretary of ciphers and translator of Latin and French to the states-general of the United Provinces. The time not engrossed by these offices was employed by Lyonnet in amassing materials and executing plates for a description which he intended to write of the insects found in the vicinity of the Hague. Abandoning this project, however, he contented himself with contributing some of his materials to a French translation of Lesser's work on

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Lyons. the *Theology of Insects*, published at the Hague in 1742. This translation, along with Lyonnet's remarks, was reprinted at Paris in 1745, by the celebrated Reaumur. Meanwhile, in 1744, he had designed and engraved the plates for Trembley's work on the fresh-water polypus. He was chosen a fellow of the Royal Society of London in 1748, and a member of the Society of Sciences at Haarlem in 1753. In 1757 he was elected a member of the Royal Academy of Sciences at Rome, through the influence of the celebrated M. Le Cat, its perpetual secretary. The publication in 1760 of his chief work, *Traité Anatomique de la Chénille qui ronge le bois de Saule*, spread his reputation, and he was honoured with diplomas of membership from the Royal Academy of Sciences of Berlin in 1760, from the Imperial Academy of Naturalists in 1761, and from the Imperial Academy of Sciences at St Petersburg in 1762. A description and plate of the instruments he had used in dissecting the *chénille* were published by Lyonnet in the *Transactions* of the Society of Sciences at Haarlem, and afterwards in French at the beginning of his *Traité Anatomique*. He had intended to pursue this track of inquiry, and to examine the animal above named in its various stages of development; but at the age of sixty an accident impaired his eyesight, and thus defeated his cherished plan. The last fifteen or twenty years of his life were spent in adding to his valuable collection of horns and shells a choice cabinet of more than 560 paintings. Lyonnet died at the Hague in 1789.

LYONS (French *Lyon*, ancient *Lugdunum*), the capital of the French department of Rhône, and, till recently, ranking in point of population and commercial importance as the second city of the empire; but the last census returns show that in the former of these respects it has been exceeded by Marseilles. It is situate at the junction of the Saône with the Rhône, and on the Paris and Marseilles Railway, 316 miles from the former, and 218 from the latter city; N. Lat. 45. 45. 45., E. Long. 4. 49. 33.; elevation above the level of the sea, 963 feet. The rivers Rhône and Saône being both navigable, it enjoys great facilities for trade; but it is as a manufacturing city that it is chiefly celebrated, and in this respect it is justly entitled to the name of the French Manchester. The staple articles of manufacture are silk stuffs of all descriptions, and which for richness and beauty are unequalled. In this manufacture about 100,000 of the population are either actively or indirectly concerned. There are no exact statistics of the silk manufacture at Lyons; but the following extract from a letter by the president of the chamber of commerce at Lyons, dated December 19, 1853, is said to give very nearly the exact results:—"During the present year and the two preceding, the manufacturers of silk at Lyons have employed about 60,000 machines (*metiers*), scattered over a district of about 40 miles. These machines have consumed about 2,500,000 kilogrammes of silk (5,500,000 lb.), valued at 160,000,000 francs (L.6,400,000); and the manufactured stuffs at 250,000,000 francs (L.10,000,000). It is estimated that the home consumption amounts to one-fourth or one-third of that quantity. The balance is exported to all parts of the civilized world; but by far the largest foreign market is found in the United States." The silk manufacture in Lyons is not carried on in large factories, but on the domestic system, in the dwellings of the master-weavers, each of which has usually from two to six or eight looms, which, with their fittings, are generally his own property. Himself and as many of his family as can work are employed on these looms, and frequently also one or more *compagnons*, or journeymen. The number of master-weavers in the city and suburbs is estimated to be about 9000. The silk merchants, of whom there are about 600 in Lyons, supply the silk and patterns to the owners of looms, who are entrusted with the task of producing

the web in a finished state. The weaving population, though earning comparatively good wages, are an ignorant and degraded race, living in a disgracefully filthy state, and showing little desire to improve their condition. Few of the journeymen ever raise themselves to be master-weavers. The silk manufacture was established here by Italian refugees in the middle of the fifteenth century. It was nearly ruined by the revocation of the edict of Nantes, which dispersed most of its best workmen to Spitalfields, Amsterdam, Crefeld, and other places. Lyons has numerous dye-works, printing establishments, foundries, glass-works, potteries, tanyards, breweries, chemical works, boat-building yards, &c., but these are all insignificant compared with its chief branch of industry. The commerce carried on by means of the rivers is very considerable. The town is built principally on the tongue of land, or peninsula, between the Rhône and Saône, each of which is crossed by eight or nine bridges communicating with extensive suburbs lying to the E. and W. The old portion of Lyons consists chiefly of narrow, crooked, and dirty streets, rendered dark and gloomy by the great height of the houses on each side, which are generally seven or eight storeys high. About three-fourths of a century ago, the point of confluence of the two rivers was removed about a mile farther S., and on the additional territory thus acquired the suburb of Perrache was formed. This has been laid out on a regular plan, and now contains many elegant streets and some very agreeable promenades. The suburb of La Croix Rousse, to the N. of the town, and that of Fourvières, on the right bank of the Saône, are chiefly inhabited by silk weavers. Those of Brotteaux and Guillotière are on the left bank of the Rhône. The best view of the town and neighbourhood is obtained from the summit of the steep hill of Fourvières, on the right bank of the Saône. The fortifications of Lyons consist of eighteen detached forts, arranged in a circle of 12½ miles round the town, crowning the heights of St Croix and Fourvières, and of Croix Rousse, above the suburb of that name, and including in its circuit the suburbs of Brotteaux and Guillotière. These fortifications are required more to quell insurrections among the inhabitants than to withstand attacks from without. In 1831, 1834, and 1837, formidable riots took place, in which many lives were lost. Both banks of the Saône and the left bank of the Rhône are lined with quays, some of which are planted with trees, and afford very agreeable promenades.

Of its numerous squares, the finest is the Place Bellecour, one of the largest in Europe, covering 15 acres, and planted with lime trees. In the centre is a bronze equestrian statue of Louis XIV. The Hôtel de Ville and the Museum, or *Palais des Beaux Arts*, form two sides of the square called *Place des Terreaux*. The former building, said to be the finest of its kind in France, was erected between 1646 and 1655. Its front is nearly 160 feet in width, flanked with a square tower and dome at either end, and in the centre is a clock tower, surmounted by a cupola, which rises to the height of 157 feet. The depth of the building is 383 yards. The *Palais des Beaux Arts*, formerly the Benedictine convent of St Pierre, consists of four large piles of building, inclosing a square court, and containing museums of antiquities and natural history, a picture gallery, schools of drawing and natural history, &c. The public library is the best provincial collection in France, containing about 80,000 printed volumes and a large collection of MSS. The cathedral of St Jean, on the right bank of the Saône, was begun in the seventh century, but not completed till the reign of Louis XI. It is a Gothic edifice, and has four towers, two of which flank the west front, while the other two, shorter but more massive, form the transepts. The church of Notre Dame stands on the summit of the hill of Fourvières, and is said to occupy the site of

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the *Forum Vetus*, built by Trajan. Numerous Roman remains have been discovered on the hill, the principal being an amphitheatre and some fine arches of an aqueduct. The Hôtel Dieu, on the quay, facing the Rhône, is one of the most ancient establishments of the kind in France, having been founded by Childebert and his queen in the beginning of the sixth century. The present building was erected by Soufflot, and receives annually about 12,000 patients.

Lyons is the seat of an archbishop; and has a court of appeal, tribunals of primary instance and commerce, a council of *prud'hommes*, a mint, a university college, having faculties of theology, science, and literature, a school of medicine and pharmacy, a lyceum, a school of arts (*Institution de la Martinière*) for the gratuitous instruction of sons of artisans, a veterinary school, school of artillery, military gymnasium, deaf-and-dumb institution, and a botanic garden.

In the revolution of 1793, the people of Lyons having declared against the revolutionary party, the city was taken by the conventional army after a siege of upwards of two months, and almost reduced to ruins. It suffered severely from the inundations of its two rivers in June 1856. Pop. (1851) 156,169.

LYONS, *Gulf of* (the ancient *Gallicus Sinus*), an extensive bay of the Mediterranean Sea, formed by the southern coast of France, between the Pyrenean range on the W., and a headland near Toulon on the E. It extends 145 miles from one extremity to the other, and washes the shores of the six departments of Pyrenees-Orientales, Aude, Hérault, Bouches-du-Rhône, and part of Var. The principal rivers that enter it are,—the Rhône, the Aude, and Tet; and the chief towns on its coast-line are,—Marseille, Cette, and Port Vendres. Its shores in many parts are broken by long lagoons and low islands.

LYRE (Gr. λύρα), the generic name for an ancient musical instrument, varying in form and in the number of its strings, these being made to vibrate by twitching with the fingers, or with a plectrum held in the right hand. It is needless here to enter upon the fabled accounts of the origin of the Greek lyre, and its improvements. As to the manner of playing upon it, and bringing out its resources, ancient writers are silent. That the ancient lyre, even with very few strings, was capable of producing a great variety of sounds differing in pitch, by skilful *stopping* of the strings, seems certain; and this view of the matter was published at Parma, in 1798, by Vincenzo Requeno, in his *Saggi sul Ristabilimento dell' arte armonica de' Greci e Romani Cantori*. His words are:—"È un insigne pregiudizio di Burney e di quanti scrissero della Greca musica prima di lui lo stimare di scarsi suoni le cetre, e le lire di pochi corde. I Greci tastarono le corde, benchè i loro stromenti non avessero il manico. Alcune lire de' Greci mostrano nelle pitture dell' Ercolano uno tavoletta quadra, per la quale passavano quattro corde, e che, scorrendo per le medesime, alzava o calava il tuono; in altre lire s' intrecciavano rette le dita per mezzo delle quattro corde, e così si tastavano. Altri stromenti si tastavano in altre maniere, come a suo luogo dimostreremo" (tomo 1^{mo}. pp. 337-8). The writer of this article quoted the above passage in his paper, "Memoirs of Music," published in the *New Edinburgh Review*, April 1822. Since then two writers have claimed as a discovery what is really due to Requeno, of whom they take no notice. That lyres, or similar instruments, were known to the ancient Egyptians and to the Hebrews, seems certain; and that large harps were known to the former is proved beyond doubt by those paintings in the tombs at Thebes, drawings of which were published in the great French work, *Description de l'Égypte*, &c. (G. F. G.).

LYRIC POETRY was such as the ancients sung to the lyre or harp. It was originally employed in celebrating the praises of gods and heroes, and its characteristic was

sweetness. The author or inventor of it is, however, unknown. It was much cultivated by the Greeks; and Horace was the first who attempted it in the Latin language. Anacreon, Alcæus, Stesichorus, Sappho, and Horace, were the most celebrated lyric poets of antiquity. (See POETRY.)

LYSIAS, one of the most celebrated of the Greek orators, was born at Athens 458 B.C., and died, at the age of eighty, B.C. 378. He was the contemporary of some of the greatest men that Athens ever produced—of Thucydides and Xenophon, of Euripides and Sophocles. He was the son of Cephalus, a Syracusan, and is himself sometimes said to have been a native of this city; but he was born at Athens, whither his father was induced to emigrate by the advice of his friend Pericles. Cephalus was distinguished both for his great riches and for his virtues. It was at his house that Plato placed the scene of the most celebrated of his works, his *Dialogues on the Republic*. Cephalus no doubt procured the best masters to forward the education of his son; but Lysias left Athens at a very early age (B.C. 443), and proceeded to Thurium, in the south of Italy, to which place the Athenians were sending a colony. He was accompanied by the two celebrated historians Herodotus and Thucydides, and remained there for many years, during which time he is said to have studied the art of eloquence under two Syracusans, Tisias and Nisias. After the unsuccessful expedition of the Athenians to Sicily (B.C. 413), it would appear that Thurium, with their other dependencies in Magna Græcia, refused to submit any longer to Athenian supremacy. All those who remained well affected towards the parent state were obliged to fly, and Lysias on that occasion (B.C. 411) returned with his brother Polemarchus to Athens. Here he employed himself in commercial pursuits, and we are told that the two brothers employed 120 slaves in the manufacture of shields. We do not hear that he took any active part in the stormy politics of Athens, now approaching the conclusion of her war with Sparta. Athens fell into the hands of Lysander, and thirty tyrants were appointed to administer the affairs of the city. The patriotism and riches of Polemarchus and of his brother Lysias marked them out as fit objects for persecution to the tyrants. Polemarchus was put to death, and Lysias with great difficulty saved his life by flying to Megara (B.C. 404). Here he engaged in the conspiracy to restore the independence of his country, and is said to have furnished three hundred men at his own expense to assist Thrasybulus. The tyrants were expelled, and Lysias returned to Athens (B.C. 403), where he commenced his new career as an orator. It does not appear that he was much employed in the assemblies of the people, but that he confined himself principally to writing *accusations* or *defences*, at the desire of such persons as had occasion to impeach the conduct of others, or to defend their own. As a reward for his services, Thrasybulus proposed to the people that he should be admitted to the freedom of the state; but Archinus procured its rejection, because the proposal had not been made first to the senate, as the law required. Plutarch states that there were extant in his time no less than 475 orations ascribed to Lysias, of which only 235 were genuine, according to Dionysius. We are likewise told that he composed institutions of oratory, epistles, and panegyrics; but of all these writings only thirty-four orations have come down to us, some of which are in an imperfect state. The pleadings of Lysias contain a curious detail of the domestic manners and internal economy of the Greeks. Dionysius of Halicarnassus has written a critique on the works and style of Lysias; and, according to him, the orator was particularly distinguished for simplicity and precision, as well as for the fidelity with which he depicted the manners of the age. Quintilian compares him to a clear and pure rivulet rather than to a majestic river; whilst Cicero considers him as the model of a perfect

Lysias.

Lysimachus.

orator. The earliest edition of the orations of Lysias is that of Aldus, 1513; but the best is that of Taylor, Gr. and Lat., London, 1739; and of Reiske, Leipsic, 1772. The latest edition is by Foertsch, Leips. 1829; who has also published separately, *Observationes Criticæ in Lysiae Orationes*, Leips. 1829. See also Franzius, *Dissertatio inaug. de Lysia oratore Attico-Græce scripta*, Norimb. 1828. There is an English translation of the *Orations* by Gillies, London, 1778. Compare L. Hoelscher, *De Lysiae Oratoris Vita et Dictione*, Berlin, 8vo, 1837; Westermann, *Gesch. der Griech. Beredsamkeit*.

LYSIMACHUS, one of the generals of Alexander, was son of Agathocles, one of the king's body-guard, but of noble descent. He appears to have been one of the noblest characters that the age of Alexander, so fertile in great men, produced. He was the pupil of the philosopher Callisthenes, who attended Alexander in his expedition; and when the king ordered Callisthenes to be put to death by the most cruel tortures, Lysimachus enabled his friend to escape by furnishing him with poison. It might have been expected that Alexander would have admired such conduct, but it was far otherwise. He ordered Lysimachus to be exposed to the fury of a lion, and that he should suffer a death somewhat resembling that which had been intended for his friend. The bravery of Lysimachus saved him: wrapping his cloak round his arm, he pushed it into the throat of the lion, and laid it dead at his feet. Alexander forgave him, and attached him more particularly to his own person. This story, which is told by Justin (xv. 3), Pliny (viii. 16), and Seneca (*De Ira*, 3, 17, et *De Clem.* 1, 25), is called fabulous by Curtius (viii. 1, 22), and is said to have originated from the circumstance of Lysimachus having been attacked by a lion in the forests of Syria, and having killed it without assistance. From this moment Alexander treated Lysimachus as his friend, and was so fond of him, that having accidentally wounded him on the forehead as he was dismounting, he took off his diadem and bound up his head with his own hands; presaging, as Justin remarks, the royal rank to which he would afterwards attain. History is then silent respecting Lysimachus till the death of Alexander (B.C. 323), when we find him receiving, as his share of the kingdom, Thrace, and the countries placed along the coast of the Euxine (Justin, xiii. 4). But Seuthes occupied Thrace with a powerful army, and it was found necessary to conquer him before he could take possession of the kingdom. In this he was successful, and also in repressing a rebellion which had broken out at Callatia, on the coast of the Black Sea (Diodor. xviii. 14; xix. 73). No sooner did he feel secure of his dominions, however, than he began to attack the Odrysæ, Getæ, and other nations around; but he was defeated and taken prisoner, according to some historians, though, according to others, this was only the fate of his son. His daughter was given in marriage to the king of the country for releasing the captive (Pausan. i. ix.). The ambition of Antigonus began to alarm the other successors of Alexander, and a league was entered into by Ptolemy, Cassander, and Lysimachus, to reduce his power within due bounds. The war was carried on with various success for several years. Lysimachus proceeded to Asia (B.C. 302) to attack Antigonus, who was then at Antigonea in Syria, and in his passage subdued Phrygia, Lydia, and other districts, taking possession of many strong fortresses, where Antigonus had collected much treasure. He was joined by Seleucus, who arrived from Babylon with a considerable body of troops, and a decisive battle was fought (B.C. 301) at Ipsus, where Antigonus was defeated and killed (Justin, xv. 4). In addition to Thrace, Lysimachus obtained Bithynia, and some countries along the Hellespont. Yet Demetrius, son of Antigonus, did not lose courage, but made constant attempts to recover his dominions. A league was formed

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against him by Lysimachus and Pyrrhus King of Epirus, and he was driven from the greater part of Macedonia; but the two allies afterwards disagreed, and Pyrrhus having been defeated, Lysimachus assumed the title of King of Macedonia, B.C. 286. In his latter years he put to death his son Agathocles, at the suggestion of his second wife, who was afraid that she herself and her children would fall into the hands of Agathocles on the death of Lysimachus. Seleucus, taking advantage of the odium which this act brought upon him, attacked Lysimachus, and having given him battle, Lysimachus was killed, B.C. 281 (Pausan. i. x.; Justin, xvii. 1, 2).

LYSIPPUS, a celebrated Greek statuary, of the city of Sicyon, in the Peloponnesus, flourished about 324 B.C. He was at first a worker in brass, but afterwards devoted himself to statuary, studying nature, by the advice of Eupompus, rather than following the manner of any master. He excelled all those who had preceded him in the nicety of individual parts, and more particularly in the beauty of the hair. He lessened the size of the head, which had been exaggerated by the ancient sculptors, and made the body more slim so as to increase the appearance of the height. He used to say, that former sculptors represented men as they were, whilst he made them as they appeared to be. His reputation was such that his name was included in the famous edict published by Alexander, when he conferred on Apelles the sole right of painting his form, on Lysippus that of executing it in bronze, and on Pyrgoteles that of engraving it on precious stones. He is said (Plin. xxxiv. 7) to have produced 1500 works of art, any one of which was sufficient to stamp him as a man of talent. Of these we can only mention a few of the most celebrated. There was one at Rome, the removal of which from the baths of Agrippa to the palace of the emperor, by order of Tiberius, had nearly caused a sedition. The populace clamoured for its being replaced, and Tiberius did not deem it prudent to deny their request. It was a statue called Apoxyomenos, representing, as its name implies, a man scraping himself in the bath with a strigilis, an instrument to clean the body of the particles of sweat. He executed many statues of Alexander, representing him at different periods of his life; and he so managed that a slight bend of the head, for which Alexander was remarkable, became rather a beauty than a deformity. One of these statues was so much admired by Nero, that he caused it to be covered with gold, to the great grief of all true lovers of the art of sculpture. He executed a very fine bronze statue of Cupid with a bow, for the inhabitants of Thespis; also equestrian statues of twenty-five Macedonians who fell at the passage of the Granicus, and which Metellus caused to be transported to Rome. It has been supposed, though without any clear proof, that the celebrated horses of Venice formed part of this group. There is a statue of Hercules in the Palazzo Pitti at Florence, which bears his name, and has in every respect a strong resemblance to the Farnese Hercules, excepting the position of the legs (*Mus. Pio-Clem.* iii., p. 66). This likewise has made it be supposed that the statue of the Palazzo Pitti is a copy of the Hercules of Lysippus, and that the Farnese is an imitation, on which Glycon thought he might engrave his name, on account of the change he had made in its position. Lysippus had as pupils his own sons, Dahippus, Bedas, and Euthycrates (Plin. xxxiv. 8.) See Müller, *Handbuch der Archæologie der Kunst*, Breslau, 1830.

LYSONS, DANIEL, an eminent antiquarian and topographer, was rector of Rodmartin, in Gloucester, a living in which he succeeded his father in 1833. He was educated at Oxford, where he graduated in 1785. When a curate at Putney, he, in 1790, commenced his first topographical work, entitled *The Environs of London; being an Historical Account of the Towns, Villages, and Hamlets within 12*

Lysippus
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Lysons,
Daniel.

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Lysons,
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Lyttelton,
George.

miles of that Capital; interspersed with Biographical Anecdotes, 2 vols. 4to, 1810; a work which he supplemented about the same time by *An Historical Account of those Parishes of Middlesex not included in the Environs of London*. In conjunction with his brother Samuel, he undertook, in 1806, his great work, the *Magna Britannica*, being a precise topographical account of the several counties of Great Britain, 6 vols. 4to; an undertaking which he left unfinished. He published a small work at Gloucester in 1824, containing *A View of the Revenues of the Parochial Clergy of this Kingdom from the earliest times*, 8vo. Lysons wrote, besides, some sermons, which are not much known. As an accurate, laborious, and useful writer of topography, he occupies a very high place. He presented, previous to his death in 1834, 64 volumes of MS. collections for the *Magna Britannica* to the British Museum.

LYSONS, Samuel, the brother of the above, was born at Rodmartin, in Gloucester, in 1763. Originally educated for the bar, he ultimately relinquished that profession for antiquarian pursuits. He was an active and influential member of the Society of Antiquaries, and became, in 1803, keeper of the records in the Tower of London. In 1806 he joined his brother in the *Magna Britannica*; and published, in 1797, *Roman Remains discovered at Woodchester and Minchenhampton*; in 1801, his *Figures of Mosaic Pavements*; in 1802, his *Remains of Roman Antiquities at Bath*; in 1804, *Gloucester Antiquities*. He wrote also for the *Archæologia*. He died in 1819.

LYTTELTON, GEORGE, Lord, was born at Hagley, in Worcestershire, in 1709. Descended from the great Judge Littelton (see LYTTELTON, Thomas), he was the eldest son of Sir Thomas Lyttelton, who, during the interregnum of 1688 and the succeeding reign, appears as one of the ablest Whig debaters of the House of Commons. Mr Macaulay (*History of England*, vol. ii., p. 617) describes him as "versed in European politics, and gifted with a vehement and piercing logic, which had often, when, after a long sitting, the candles had been lighted, roused the languishing house, and decided the event of the debate." He received his education at Eton school, where he showed an early inclination to poetry. He was removed from thence to the university of Oxford, where he pursued his classical studies with uncommon avidity, and sketched the plan of his *Persian Letters*. In the year 1728 he set out on the tour of Europe; and, upon his arrival at Paris, accidentally became acquainted with the Honourable Mr Poyntz, then our minister at the court of Versailles, who employed him in many political negotiations, which he executed with great judgment and fidelity. In this early part of his life he wrote a poetical epistle to Dr Ayscough, and another to Mr Pope, both evincing singular taste and correctness.

After continuing a considerable time at Paris he visited Lyons, Geneva, Turin, Milan, Venice, and Genoa, and finally established himself at Rome, where he applied himself closely to the study of the fine arts. He soon afterwards returned to his native country, and was elected representative for the borough of Ockhampton, in Devonshire. In the year 1737 he was appointed principal secretary to his royal highness, Frederick Prince of Wales; and in the year

1742 he married Lucy, the daughter of Mr Hugh Fortescue of Filleigh, in the county of Devon, an excellent lady, whom he had the misfortune to lose in 1746. In 1744 he was appointed one of the lords commissioners of the Treasury; and, during his continuance in that station, constantly exerted his influence in rewarding merit and ability. He was the friend and patron of Fielding, Thomson, Mallet, Young, Hammond, West, Pope, and Voltaire. On the death of Thomson, who left his affairs in a very embarrassed condition, Mr Lyttelton took that poet's sister under his protection. He revised Thomson's unfinished tragedy of *Coriolanus*, and brought it out at the theatre royal, Covent Garden, with an affecting prologue of his own composition.

His valuable observations on the conversion and apostleship of St Paul were written in 1747, at the desire of Mr Gilbert West, in consequence of Mr Lyttelton's asserting, that besides all the proofs of the Christian religion which might be drawn from the prophecies of the Old Testament, from the necessary connection it has with the whole system of the Jewish religion, from the miracles of Christ, and from the evidence given of his resurrection by all the other apostles, he thought the conversion of St Paul alone, duly considered, was of itself a demonstration sufficient to prove that Christianity was a divine revelation. Dr Johnson characterizes this treatise as one "to which infidelity has never been able to fabricate a specious answer."

In 1754 he resigned his office of lord of the Treasury, and was made cofferer to his majesty's household, and sworn a member of the Privy Council; previously to which, he married a second time, Elizabeth, daughter of Field-Marshal Sir Robert Rich, from whom he was separated, by mutual consent, a few years after his marriage. After being appointed chancellor and under-treasurer of the Court of Exchequer, he was, by letters-patent dated the 19th of November 1757 (31st Geo. II.), created a peer of Great Britain, by the style and title of Lord Lyttelton, Baron of Frankley, in the county of Worcester. His parliamentary speeches showed sound judgment, ready eloquence, and inflexible integrity. During the last ten years he lived chiefly in retirement, devoting himself for the most part to literature. His *Dialogues of the Dead*, in which the morality of Fénelon and the spirit of Fontenelle are happily united, appeared in 1760. His *History of Henry II.*, a laborious and respectable production, the fruit of twenty years' labour, was published in 1764-67. He died in 1773.

A complete collection of his works was published after his decease by his nephew, Mr George Ayscough. (See *Memoirs and Correspondence of Lord Lyttelton*, 1734-1773, 2 vols. 8vo, London, 1845.)

LYTTELTON, Thomas, Lord, son of the above, and his successor in the peerage, was a young man of distinguished ability, who wasted his strength and his life by profligacy. A writer in the *Quarterly Review*, January 1852, endeavoured, with very considerable skill, and some degree of plausibility, to prove Thomas Lord Lyttelton to be the author of the *Letters of Junius*. There is a singular, and some say well-authenticated story, which relates that he was warned of his death three days previous to its occurrence in 1779, when only thirty-five years of age.

Lyttelton,
Thomas.

M.

M
Mably.

M is the thirteenth letter of the English alphabet, and a labial articulation of the liquid series, formed by the compression of the lips. It is called a semi-vowel, as the compression of the lips necessary to its articulation is accompanied with a humming sound through the nose, thus distinguishing it from the sound of the letter B, which in other respects so closely resembles it. M is uniform in sound, and scarcely ever silent. It is liable to interchange with the letters N, B, P, V, W, of which there are numerous examples in almost all languages. The letter M, or a symbol closely resembling it, was employed by the Romans as a numeral to denote a thousand, selected, as is generally supposed, from its being the initial of the word *mille*. With a dash over it (\bar{M}), it stands for a thousand times a thousand, or a million. For the use of M in ancient and modern abbreviations, see under ABBREVIATIONS. In astronomical tables, M stands for *meridian*, *meridional*, or *mid-day*. In medical prescriptions, M stands for *manipule*, or handful; for *misce*, or mix; for *mixture*, a mixture; and sometimes for *mensurâ*, by measure. In law, M is the brand of manslaughter, and is impressed on one who, after conviction, is admitted to the benefit of clergy.

MAAT, JOHN. (See BLANKOF.)

MABILLON, JEAN, a learned writer of France, was born at Perremonte, on the frontiers of Champagne, in the year 1632. He was educated in the university of Rheims, and afterwards entered into the abbey of the Benedictines of St Rémy. In the year 1663 he was appointed keeper of the treasures and monuments of France at St Denis. Next year he went to Paris, and proved serviceable to Father d'Acheri, in compiling his *Spicilegium*. Soon afterwards the congregation of Saint-Maur charged him with the edition of St Bernard, which he prepared with extraordinary diligence. In the year 1685 Louis XIV. sent him into Germany, to search the archives and libraries of the ancient abbeys for all that seemed calculated to illustrate the history of the church in general, and that of France in particular. Mabillon published an account of this journey in his *Iter Germanicum*. In the year 1685 he undertook a similar journey into Italy, and returned the year following with a very noble collection, of which he gave an account in his *Museum Italicum*. He also wrote an *Iter Burgundicum*, a work similar to those just mentioned. Next to Mabillon's *Correspondence*, one of his most interesting works is his *Reflexions sur les Prisons des Ordres Religieux*, in which he censures the cruelties of the monastic houses, and discloses the horrors of the famous subterranean dungeons, known as *Vade in Pace*, in which some were confined till they died. Another event in Mabillon's life worthy of being recorded, was the bold stand he made, in his *Traité des Études Monastiques*, in 1691, against the narrow bigotry of the Abbé de Rancé, who had forbidden the monks all scientific studies, and all reading, except the *Breviary*. Mabillon died at Paris in 1707. He was one of the most learned, liberal, and candid men of his age. His various works were collected and published after his death, under the title of *Ouvrages Posthumes de D. Jean Mabillon et D. Thierry Ruinart, Bénédictins de la Congregation de St Maur*, 3 vols. 4to. Paris, 1724.

MABLY, GABRIEL BONNOT DE, a French abbé, and brother of Condillac, was born at Grenoble on 14th March 1709. After receiving his education from the Jesuits in Lyons, he repaired to Paris, and, at the instance of his kinsman, the Cardinal De Tencin, entered the theological

college of St Sulpice. No sooner, however, had he reached the rank of sub-deacon, than he threw aside the studies proper to his order, and devoted all his time to profane literature. His first work, *Parallèle des Romains et des Français par Rapport au Gouvernement* (Paris, 1740), met with great success, and led to his being appointed secretary to the Cardinal De Tencin, at that time minister. In the discharge of his new office, Mably collected the greater part of that political information which he afterwards embodied in his *Droit Public de l'Europe fondé sur les Traités*, published in 1748, and reprinted with additions and improvements in 1754 and 1764. In 1743, after a series of secret negotiations, he concluded with the Prussian ambassador at Paris a treaty against Austria; and in 1746 he drew up the instructions for the French minister at the congress of Breda. Soon afterwards a quarrel with the cardinal induced Mably to retire into private life, and devote his time entirely to study. He died at Paris in 1785. His principal works are,—*Observations sur l'Histoire de la Grèce*, and *Observations sur les Romains*, 1751; *Principes des Negotiations*, La Haye, 1757; *Entretiens de Phocion sur le Rapport de la Morale et de la Politique*, 1763; *Observations sur l'Histoire de France*, Genève, 1765, reprinted, with notes by Guizot; *De la Legislation, ou Principes des Lois*, Amsterdam, 1776; *De la Manière d'écrire l'Histoire*, 1782; and *Observations sur le Gouvernement et les Lois des États-Unis d'Amérique*, 1784. His entire works were published by Abbé Brizard, in 15 vols. 8vo, 1794. Mably was an advocatè for equality in rank and community in property. Sparta, under the legislation of Lycurgus, was his model of a government.

MABUSE, or MAUBEUZE, JAN DE, an eminent painter, was born in 1499 at Maubeuze, in Hainault, and was originally called John Gossaert. After studying the great masters in Italy, he visited in succession Utrecht and Middleburg. His character was noted for the union of the lowest profligacy with the greatest enthusiasm for his art; and at this latter city he was imprisoned for some misdemeanour. He then repaired to England, and was employed to paint the children of Henry VIII. and several of the nobility. He is said to have died in 1562. The most famous picture of Mabuse is his altar-piece at Middleburg, representing the Descent from the Cross.

MACADAM, JOHN LOUDON, the introducer of macadamized road-making, was descended from an old and respectable family in Kirkcudbrightshire, and was born in Ayrshire, Scotland, in 1756. His plan of road improvement occurred to him when acting as trustee for a district of roads in Ayrshire, and was first carried into practice on the Bristol roads, of which he had been appointed surveyor-general in 1815. He explained his system fully in two works,—*A Practical Essay on the Scientific Repair and Preservation of Public Roads*, London, 1819; and *Remarks on the Present State of Road-making*, London, 1820. In 1827 he was appointed general surveyor of roads; and for the large sums which he expended while performing the duties of this office, he was afterwards compensated by two grants from government, amounting together to L.10,000. The honour of knighthood, which he declined, was conferred upon his son in 1834. Macadam died in 1836.

MACAO, a Portuguese settlement in China, on a small peninsula projecting from the S.E. end of the island of Hiangshan, or Macao, lying at the mouth of the Canton River, 80 miles S.S.E. of Canton, and 40 miles W. of Hong

Mabuse
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Macao.

Macaronic Kong; N. Lat. 22. 12. 45., E. Long. 113. 35. The peninsula is $2\frac{1}{2}$ miles in length, by less than a mile in breadth, and is connected with the mainland by a low, narrow, and sandy isthmus. A barrier wall, with a gate and guard-house, extends across the isthmus, to exclude foreigners from the interior of the island. The town is built on the declivities round the semicircular harbour; the shore being lined by an embanked parade, behind which is a terrace of handsome houses. Behind this terrace lies the rest of the town, a curious intermixture of Chinese and European edifices. The chief buildings are,—the senate-house, the church and college of St Joseph, and the Portuguese governor's residence. The cave of Camoens, where that poet is said to have written a portion of his *Lusiad*, is picturesquely situate on the summit of a small hill on the margin of the inner harbour, and is much resorted to. The harbour is on the west side of the town, between it and the small island of Patera, but it has not sufficient depth of water to admit large vessels, which accordingly anchor in the roads on the other side of the peninsula, from 5 to 10 miles from the town. The Chinese regulations permit none but Portuguese and Spanish vessels to trade at the port, though vessels of other nations generally have little difficulty in obtaining the connivance of the Chinese officials to trade, and the Portuguese inhabitants are ready to lend their names for a trifling consideration. The town and harbour are protected by six forts. The Portuguese obtained this settlement in 1586, in return for services rendered by them against pirates that had infested the coast. It subsequently became the centre of a very extensive trade with China, Japan, the Philippines, and other eastern countries. It has, however, long sunk into insignificance, and now carries on very little trade. The Portuguese have a government and senate, but a Chinese mandarin has in reality the supreme power in the town. The Portuguese pay annual tribute, or ground rent, for their settlement. Pop. about 13,000, of whom above a half are Chinese.

MACARONIC, a ludicrous species of metrical composition, in which the words of a modern language are Latinized. The name is said to be derived from the Italian *maccheroni*, a mixture of paste, butter, spice, and grated cheese. The ostensible originator of this kind of verse was Theophilo Folengo, or, as he called himself, *Merlinus Coccaius*, a monk of Casino, in Italy, born in 1512. He wrote a burlesque Latin poem, chequered with Italian, Tuscan, and plebeian words, entitled *Phantasiæ Macaronicæ*; and in the *apologetica* to that work, the author describes this new species of poetry as follows:—"Ars ista poetica nuncupatur *Ars Macaronica*, a *Macaronibus* derivata: qui *Macarones* sunt quoddam pulmentum, farina, caseo, butyro compaginaturn, grossum, rude, et rusticum. Ideo *Macaronica* nil nisi grossedinem, ruditatem, et *Vocabulazzos* debet in se continere." Antonius de Arena of Avignon wrote in this style of verse as early, some say, as 1519. At all events, it soon after became highly fashionable in England, France, and Italy. John Skelton introduced it into England in the reign of Henry VII., and Rabelais, who so often refers to "Merlin the Cook" (Coccaie), first employed this style in French prose. Perhaps the best known form of macaronics in this country is the *Polemomidinia*, a Scottish burlesque in hexameters, by Drummond of Hawthornden. Some of the most successful macaronics of modern times have appeared in the pages of *Punch*.

MACARTHY ISLAND. See GAMBIA.

MACARTNEY, GEORGE (*Earl Macartney*), was the only son of a gentleman of Scottish descent, and was born in 1737 at the family estate of Lissanoure, near Belfast, in Ireland. After graduating at Trinity College, Dublin, he repaired to London in 1759, and became a student of the Inner Temple. In 1764 he was appointed envoy extra-

ordinary to the Empress of Russia. He returned in 1767, and after sitting for some time in the British parliament as member for Cockermouth, he became chief secretary for Ireland in 1769. On the expiry of this office in 1772 he was created Knight of the Bath. Appointed governor of Granada in 1775, Macartney was taken prisoner on the surrender of that island to the French in 1779, but was soon afterwards released. He became president of Madras in 1780, and would have been installed in the high office of governor-general of India had not his impaired health forced him to return to England in 1789. In 1792 he was appointed ambassador extraordinary to the court of Pekin. He was thus the first English envoy sent to China; and if he did not succeed in attaining the results expected, the fault was in nowise his. Immediately before his return in 1794, the title of baron, which had been conferred on him in 1776, was changed into that of Earl Macartney. He held the governorship of the Cape of Good Hope from 1796 until he was compelled by declining health to resign it in 1798. After living for some time in retirement, Lord Macartney died at Chiswick in 1806.

An account of his public life, with a selection from his unpublished writings, was published by his private secretary Barrow, in 2 vols. 4to, London, 1807. Sir George Staunton, who accompanied him to China as secretary, wrote an account of his Chinese embassy in 2 vols. 4to, London, 1797.

MACASSAR, or **MANKASSER**, called also by the Dutch *Vlaardingen*, a free seaport-town of the island of Celebes, on its S.W. peninsula, and capital of a cognominal government, is situate at the mouth of a river; S. Lat. 5. 9., E. Long. 119. 36. It is regularly laid out in rectangular streets, is surrounded by a wall, and environed by Malayan suburbs. The harbour, which has excellent anchorage, is protected by Fort Rotterdam. A considerable trade is carried on with China and Australia in the various productions of the country. The town was built by the Dutch on the site of a Malayan village, and was declared a free port in 1846. Pop. about 20,000. (See CELEBES.) The Straits of Macassar separate the islands of Celebes and Borneo, and extend about 300 miles from N. to S., with an average breadth of 126 miles, excepting at the northern extremity, where it contracts to about 60 miles. It is of very dangerous navigation, abounding with shoals, rocks, and rocky islands.

MACAULEY, CATHERINE, author of a *History of England*, was the daughter of John Sawbridge, Esq. of Olantigh, Kentshire, and was born there in 1733. In 1760 she was married to Dr George Macauley, a physician in London. Her principal work, entitled *The History of England from the Accession of James I. to that of the Brunswick Line*, began to be published in 1763, and was completed in eight volumes. This treatise, which went no farther than the Revolution, she supplemented, in 1778, by a series of letters, which brought the *History of England* as far down as the resignation of Walpole in 1742. Meantime the husband of Mrs Macauley had died; and in 1778 she became the wife of a young clergyman of the name of Graham. A favourer of republican opinions, she had carried on a correspondence with General Washington, and in 1785 she paid him a visit in America. She died in 1791. Besides her *History*, Mrs Macauley wrote *Remarks on Hobbes' Rudiments of Government and Society*, 8vo, 1767, republished, with additions, 4to, London, 1769; *Reply to Mr Burke's Pamphlet entitled "Thoughts on the Causes of the Present Discontent,"* 8vo, London, 1770; *A Modest Plea for the Property of Copyright*, 8vo, London, 1774; *Address to the People of England, Scotland, and Ireland, on the present Important Crisis of Affairs*, 8vo, Bath, 1775; *Treatise on the Immutability of Moral Truth*, 8vo, London, 1783,—republished, with additions, under the title, *Letters on Education*, 4to, London, 1790; and *Observations on the*

Macassar
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Macauley.

Macbeth *Reflections of E. Burke on the Revolution in France*, 8vo, 1790.

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Maccabees.

MACBETH, a Scotch nobleman in the eleventh century, nearly allied to Duncan, King of Scotland, and the hero of Shakspeare's tragedy of *Macbeth*. The most authentic account of Macbeth represents him as the vassal of Thorfinn, a Norwegian prince, then master of the north of Scotland. Being called upon in the Norseman's absence to defend his territory against King Duncan, who attempted to regain it, Macbeth met the Scots king at Elgin, A.D. 1040, defeated his army, slew himself, and seized his crown. After various fruitless attempts to regain his crown, Malcolm Kenmore, son of the late king, succeeded, by the assistance of Siward, Earl of Northumberland, after a battle in which Macbeth was slain, in gaining possession of his father's throne. (See Skene's *Highlanders of Scotland*, vol. i., p. 115.)

MACCABEES, BOOKS OF (Gr. Μακκαβαίοι), a name usually supposed to have been cabalistically derived from מַכְבִּי (*Makkabi*), the initial letters of בְּאֵלִים יְהוָה מִי כִמּוֹהוּ ("who among the gods is like Jehovah?"), the motto on the Jewish standard in the war with the Syrians. The Books of Maccabees are the titles of certain Jewish histories, containing principally the details of the heroic exploits of the family of the Maccabees. (See JEWS.)

There were in all four books (to which some add a fifth) known to the ancients, of which three are still read in the Eastern, and two in the Western, Church. Of these the *third* is the first in order of time. We shall, however, to avoid confusion, speak of them in the order in which they are commonly enumerated.

The First Book of Maccabees (the second in order of time), contains a lucid and authentic history of the undertakings of Antiochus Epiphanes against the Jews, from the year B.C. 175 to the death of Simon Maccabæus, B.C. 135. This history is confessedly of great value. Although its brevity, observes De Wette (see 1 Macc. i. 6; viii. 7; xiii.), renders it in some instances unsatisfactory, defective, and uncritical, and occasionally extravagant, it is, upon the whole, entitled to credit, chronologically accurate, and advantageously distinguished above all other historical productions of this period (*Einleitung in die Apokryphe Bücher*, § 299). There is little question that this book was written in Hebrew, although the original is now lost. The Greek version abounds in Hebraisms and errors of translation. Origen gives it a Hebrew title; and Jerome says that he had seen the Hebrew original. Of the author nothing is known; but he must have been a Palestinian Jew, who wrote some considerable time after the death of Simon Maccabæus, and even of Hyrcanus, and made use of several written, although chiefly of traditionary, sources of information. At the same time, it is not impossible that the author was present at several of the events which he so graphically describes. The Greek text of the Alexandrine version is the original of all the others now extant. This text was that made use of by Josephus.

The Second Book of Maccabees (the third in order of time) is a work of very inferior character to the first. It is an abridgment of a more ancient work, written by a Jew named Jason, who lived at Cyrene, in Africa, comprising the principal transactions of the Jews which occurred during the reigns of Seleucus IV., Antiochus Epiphanes, and Antiochus Eupator. It partly goes over the same ground with the first book, but commences ten or twelve years earlier, and embraces in all a period of fifteen years. It does not appear that the author of either saw the other's work. It is often self-contradictory, and differs with the first book in the account of the death of Antiochus Epiphanes.

We are not aware when either Jason himself or his epitomiser lived. S. G. Hase supposes it to have been written B.C. 150, by the author of the *Book of Wisdom*. Jerome

(*Prolog. Galeat.*) observes that the phraseology of this Maccaroni. book evinces a Greek original. There have been two books of Maccabees found among the Chinese Jews; but whether they are the same with ours is doubtful.

The Third Book of Maccabees (the first in order of time) is still read in the Greek church, and is contained in the Alexandrian and Vatican MSS. (A. & B.). It contains an account of the persecution of the Egyptian Jews by Ptolemy Philopator, who is said to have proceeded to Jerusalem after his victory at Raphia over Antiochus the Great, B.C. 217, and after sacrificing in the temple, to have attempted to force his way into the Holy of Holies, when he was prostrated and rendered motionless by an invisible hand. Upon his return to Egypt, he revenged himself by shutting up the Jews in the Hippodrome, and exposing them to be crushed beneath the feet of elephants. This book contains an account of their deliverance by divine interposition. It is regarded by De Wette as a tasteless fable; and Dr Milman (*Hist. of the Jews*) describes it as a "romantic story." The author is unknown. Dr Allix (*Judgment of the Jewish Church*) considers it to have been written B.C. 200, and by the author of *Ecclesiasticus*. The work is first found in Latin in the edition of Frobenius (1538). It was translated into English by Walter Lynne (1550); by Whiston (*Authentic Documents*, 1719 and 1727); by Crutwell (*Bible*, 1785); and again by Dr Cotton (*Five Books of Maccabees*, 1832).

The Fourth Book of Maccabees, which is also found in the Alexandrian and Vatican MSS., is generally supposed to be the same with the *Supremacy of Reason*, attributed to Josephus, with which it for the most part accords. It consists of an inflated amplification of the history of the martyrdom of Eleazar and of the seven brothers, whose torments and death, with that of their mother, form the subject of 2 Macc., ch. vi. vii. It is found in the Greek Bibles printed at Basle in 1545, and at Francfort in 1597, where it is entitled *The Book of Josippos (Josephus) on the Maccabees*. It bears the same title in several other MSS. Calmet (*Pref. to the Fourth Book of Macc.*) has pointed out several contradictions between this and the second book, as well as the books of Moses, together with some opinions derived from the Stoics, such as the equality of crimes; which, he supposes, together with its tedious descriptions, have consigned it to the rank of an apocryphal book. The fourth book was printed by Dr Grabe from the Alexandrian MS. in the British Museum. There is a French translation by Calmet (*Commentary*), and an English one by Dr Cotton (*Five Books of Maccabees*, 1832).

What has been called the *Fifth Book of Maccabees* is now extant only in the Arabic and Syriac languages. It was first published, as the supposed *Fourth Book*, in the Paris Polyglott, with a Latin version, of which Dr Cotton has given a translation. It is impossible to ascertain the author, who could scarcely have been Josephus, as he disagrees in many things with that historian. The work consists of a history of Jewish affairs, commencing with the attempt on the treasury at Jerusalem by Heliodorus, and ending with the tragic fate of the last of the Asmonæan princes, and with the inhuman execution by Herod of his noble and virtuous wife Mariamne, and of his two sons. This history thus fills up the chasm to the birth of Christ.

The first two books of Maccabees have been treated with a high degree of respect in the Christian church. Origen, professing to give a catalogue of the canonical books, adds, "besides, there are the Maccabees." In his preface to the Psalms he excludes the two books of Maccabees from the books of holy Scripture. The first councils which included them in the canonical Scriptures were those of Hippo and Carthage, and they were not received with the other books till the Council of Trent.

MACCARONI, a kind of wheaten paste formed into

Maccles-
field.

M'Crie.

long slender tubes, used in this country with cheese, and in soups, &c. It is a favourite dish with all classes in Naples, and a great many live on it almost exclusively. The flour, after being mixed with water, is kneaded by heavy wooden blocks, and then, when sufficiently tough, is forced through a number of holes so fashioned that it comes out in a tubular shape. The largest tubes are called *maccaroni*, the smaller *vermicelli*, and the smallest *fedelini*. After being properly boiled, it is taken out of the vessel, drained, saturated with gravy, and sprinkled with grated cheese. The poor, however, use it without condiment. The best *maccaroni* is to be found at Naples.

MACCLESFIELD, a municipal and parliamentary borough, and manufacturing town of England, county of Chester, on the Bollin, 17 miles S. by E. from Manchester, and 167 from London by railway. It is pleasantly situate on a declivity near the borders of Macclesfield Forest, and consists of four principal streets which meet in the market-place. The town is well supplied with water, brought from springs in the neighbouring hills; and baths and wash-houses have lately been established. The town-hall is a commodious and handsome Grecian building of recent erection, having, besides the courts of justice, offices, &c., a large assembly hall. The old church of St Michael, founded by Eleanor, queen of Edward I., in 1278, but since almost entirely rebuilt, is a large structure, partly Gothic, and has a massive tower, formerly surmounted by a lofty steeple. Several of the other churches are handsome buildings. The Independents, Methodists, Baptists, Roman Catholics, and others, have places of worship here. The free grammar school, founded in 1502 by Sir John Percival, and refounded by Edward VI., has a revenue of about £1500. A commercial school has recently been established on this foundation. There are also national, infant, charity, and other schools. A school of design was established here in 1851; and a subscription library, founded in 1770, now contains upwards of 20,000 volumes. The staple manufacture of Macclesfield is silk in all its various branches. About seventy mills are employed in throwing silk; besides which there are numerous establishments in which broad silks, handkerchiefs, and similar goods are made. The mills are mostly situate on the Bollin. The cotton manufacture has recently been introduced, and is now in a very flourishing condition. There are also several dye-works, foundries, and breweries in the town. Coal, slate, and stone are found in the vicinity. The Macclesfield Canal, which passes the town, unites the Grand Trunk and the Peak Forest canals, and thus affords water communication with most parts of England. Macclesfield was first incorporated by charter in 1260, by Prince Edward, son of Henry III. as Earl of Chester, but it had no voice in parliament till the Reform Bill granted it the privilege of returning two members. It is divided into six wards, and is governed by a mayor, 12 aldermen, and 36 councillors. Market-days, Tuesday and Saturday. Pop. (1851) 39,048.

M'CRIE, THOMAS, D.D., author of the *Life of Knox*, was born at Dunse, in North Britain, in the month of November 1772. His parents belonged to the class of Seceders known in Scotland as Antiburghers, and he was educated with a view to the ministry in that persuasion. After passing through the ordinary course of education afforded in a country town, he came to Edinburgh, and enrolled himself as a student in the university, in the winter of 1788. During that and the two following sessions he pursued the course of literary and philosophical study prescribed to students intending to devote themselves to the

ministry; and in 1791 he entered the theological class at Whitburn, under the Rev. Archibald Bruce, the teacher or professor of divinity to the Associate Antiburgher Synod. As the attendance upon this course was only for a limited period each year, it was usual for the students, whose means were generally very scanty, to employ the intervals in teaching. In this way Mr M'Crie, in the autumn of 1791, proceeded to Brechin, and opened a school in connection with the Associate Antiburgher congregation in that town; and he continued there, excepting the time annually required at Whitburn in the three following sessions (1792 to 1794) for completing the regular course of theological study.

In September 1795, Mr M'Crie was licensed to preach by the Associate presbytery of Kelso. In the beginning of the next year he received a call from the Second Associate Congregation of Antiburghers in Edinburgh; and some scruples having been obviated by an act of the Associate Synod, dated 3d May 1796, he was ordained to that charge on the 23d of that month. In this pastoral relationship he continued for upwards of ten years, evidently with the sincere attachment of his people.

At this period Mr M'Crie, by diligent and assiduous study, was acquiring that profound theological knowledge, and that fund of literary and ecclesiastical information, for which in after life he was so distinguished. The proceedings of the religious body with whom he was connected may also have had some effect in directing his pursuits towards subjects connected with the history, constitution, and polity of the Reformed church.

Mr M'Crie was one of five ministers who protested against what they considered to be a spirit of innovation on the part of the Synod, while engaged in the revision and enlargement of the *Judicial Act and Testimony*, which had hitherto served as the bond of ministerial and religious communion, in order, as it was expressed, to adapt it "more to the circumstances of the present time." The result of their proceedings was a sentence of deposition by the Associate Synod; and, in the case of Mr M'Crie, a litigation in the Court of Session. The task devolved upon Mr M'Crie to publish an explanation of the controversy between the Synod and them; and this appeared in 1807. Although of a controversial nature, respecting differences which attracted no very great share of public notice at the time, this Statement involves the discussion of principles which have since been much more widely agitated by the Voluntary question; and it has been appealed to by the friends of the Established Church, as explaining and enforcing the true grounds of connexion between the church and state, and as an able and elaborate argument of the obligation on civil rulers to make suitable provision for the religious interests of the community.

In the comparatively obscure and humble situation in which Mr M'Crie was now placed, he was enabled to devote his leisure hours to his favourite literary pursuits. *The Life of John Knox, containing Illustrations of the History of the Reformation in Scotland*, appeared in the beginning of 1812, in 1 vol. 8vo, pp. 580, and a new edition appeared in an enlarged and corrected form in 1813.¹

The next subject in which Dr M'Crie engaged was a *Life of Andrew Melville*, the able and intrepid assertor of Presbytery; which might serve as a continuation to his former work, by giving an account of ecclesiastical transactions in Scotland during the latter part of the sixteenth and beginning of the seventeenth century. This work was published in 1819, in 2 vols. 8vo.²

In 1817 Dr M'Crie took occasion, in a review of the

¹ The fifth edition, carefully revised by the author, and containing his last corrections, was published in 1831, 2 vols. 8vo.

² The title is, *The Life of Andrew Melville; containing Illustrations of the Ecclesiastical and Literary History of Scotland during the latter part of the Sixteenth and beginning of the Seventeenth Century. With an Appendix consisting of original papers.* A second edition, revised, was published in 1824, also in 2 vols. 8vo.

M'Crie.

M'Crie. first series of the *Tales of my Landlord*, to offer an elaborate defence of the Covenanters. Sir Walter Scott, who had not then stood forth as the acknowledged author of the *Waverley Novels*, was persuaded by the editor of the *Quarterly Review* to become the reviewer of his own work, when he took the opportunity of vindicating his statements in answer to the article in the magazine.

In February 1816, Dr M'Crie succeeded the Reverend Archibald Bruce, Antiburgher minister at Whitburn, as professor of divinity. On the union of the two seceding bodies, under the designation of the "Associate Synod of Original Seceders," Dr M'Crie resigned the divinity chair to the Rev. Dr Paxton, author of *Illustrations of the Holy Scriptures*; and resuming his literary labours, he next published, in 1821, *Two Discourses on the Unity of the Church*. This was followed in 1825 by a volume entitled *Memoirs of Mr William Veitch and George Bryson, written by themselves: with other Narratives Illustrative of the History of Scotland, from the Restoration to the Revolution: to which are added, Biographical Sketches and Notes*, 8vo, pp. 540.

The next subject of his investigation led to the publication, in 1827, of a *History of the Progress and Suppression of the Reformation in Italy in the Sixteenth Century, including a Sketch of the Reformation in the Grisons*, 8vo, pp. 484. Also, in 1829, as a sequel to that work, a *History of the Progress and Suppression of the Reformation in Spain in the Sixteenth Century*. 8vo, pp. 424. These volumes undoubtedly form a valuable accession to the history of the Reformation throughout Europe, although the author laboured under great disadvantages in having but limited access to original sources of information, compared to what was within his reach in matters of our own ecclesiastical history. Both volumes, however, present masterly sketches of the periods of which they treat, and no subsequent historian has arisen to give a more extended history of the suppressed reformations on the continent.

Dr M'Crie was induced to undertake a life of John Calvin the Reformer, which had been looked for from his hand, and which he himself had long contemplated; and he had made some progress in writing the introductory portion at the time when his earthly labours were brought to a close in the summer of 1835.¹ He was interred in the New Greyfriars burying-ground.

A detailed and interesting *Life* by his eldest son, the Rev. Dr M'Crie, appeared in 1840. To his care we are also indebted for the publication of a posthumous volume of *Sermons*, 1836; a collection of his *Miscellaneous Writings*, 1841; sketches of *Lectures on Esther*; and a complete edition of his works in crown 8vo.

In private life, Dr M'Crie was dignified, kind, affable, and free from everything like display or desire of notoriety; being remarkable for his cordiality of manners, cheerfulness of temper and conversation, and his unaffected simplicity. As a preacher, his style of address was rather unprepossessing, partly from want of action, and partly from his slow, monotonous, and somewhat constrained delivery, as if afraid to speak out in the natural tone of his voice. But any deficiency of artificial eloquence was amply compensated for by his profound and luminous expositions of Scripture, expressed in clear and energetic language; and several of his printed discourses make good his claim to stand in the first rank of Scottish preachers. In his literary character, by which he will be known in after times, it will be acknowledged that his mind was of no ordinary cast. With extensive erudition, and habits of indefatigable research, he combined sound judgment, and a singular acuteness and sagacity of intellect. His learning

was both profound and extensive, as he was not only skilled in what are called the learned languages, but was conversant with most of those of modern Europe. Still, with all his natural love of literary pursuits, he kept such employment in subservience to his duty as a diligent and faithful minister of Christ. For nearly forty years he laboured with the most affectionate solicitude for the spiritual interests of his flock, and much of his time was devoted to them in his week-day ministrations. It was chiefly a consideration of the paramount importance of such a charge, we imagine, that caused him to decline the prospect of a chair in the University of Edinburgh. There is every reason also to believe, that had his life been spared a few months longer, the honorary office of Historiographer-Royal for Scotland would have been conferred, unsolicited, upon him, as a public testimony due to him. He has been styled by Hallam the "Hildebrand of the Reformation;" but it must be confessed that his warm championship of Knox was the result of profound conviction and untiring research. The philosophic wisdom and candour that pervade his writings are rarely to be found in the productions of men subjected, as he was early and for a long period, to neglect and poverty for conscience sake.

MACCULLOCH, DR JOHN, a miscellaneous writer, descended from an old Scottish family, was born at Guernsey in 1773. While still a child, he removed with his family to Cornwall, and after attending several schools, was at last sent in 1787 to the grammar school of Lostwithiel. In 1790 he began the study of medicine at Edinburgh; and at the early age of eighteen received the diploma of physician. Too young, however, for private practice, he remained in Edinburgh for five years, and after filling successively the offices of assistant-surgeon in the artillery, and chemist to the Board of Ordnance, he settled in 1807 as a physician at Blackheath. This profession he relinquished in 1811, and for several years afterwards he was employed by government in making various surveys in Scotland. Of these, the most important was his mineralogical and geological survey of that country, begun in 1826 and completed in 1832. He died at Penzance in 1835, from the effects of a fall. At the period of his death Dr Macculloch was lecturer on geology and chemistry in the military establishment at Addiscombe. He had also been appointed, in 1820, physician in ordinary to Leopold of Saxe-Coburg, and was fellow of the Royal, Linnean, and Geological Societies. In addition to the knowledge of mathematics, geology, mineralogy, medicine, chemistry, and theology, displayed in his various works, he possessed an acquaintance with physics, botany, zoology, astronomy, and the mechanical arts. He was also skilled in music, drawing, and architecture. He published *Remarks on the Art of Making Wine*, 12mo, 1816; *A Description of the Western Islands of Scotland*, in 2 vols. 8vo, London, 1819; *A Geological Classification of Rocks*, 8vo, London, 1821; and *The Highlands and Western Islands of Scotland, containing Descriptions of the Scenery, Antiquities, &c.*, in 4 vols. 8vo, London, 1824. In 1837 was published his posthumous work, entitled *Proofs and Illustrations of the Attributes of God from the Facts and Laws of the Physical Universe, being the Foundation of Natural and Revealed Religion*, in 3 vols. 8vo, London. He also contributed several papers to the seventh edition of this Encyclopædia, to the *Transactions of the Geological Society*, to the *Edinburgh Review*, and to other periodicals.

MACDIARMID, JOHN, was born at Edinburgh in 1789, and educated at the university of that city, where he afterwards commenced his career as a clerk in the Commercial Bank. Having a taste for literature, which he as-

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¹ It may be noticed, that Dr M'Crie, in May 1834, visited London to give his evidence before the Committee of the House of Commons on Church Patronage. His evidence forms part of the voluminous Report on that question, pp. 356-374, and 383-393.

Macdonald
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Macedo.

siduously cultivated, he became editor of the *Dumfries Courier* in 1817, which he conducted with originality and taste. He died November 12, 1852. In addition to his contributions to the newspaper, he published *The History of Dumfries, A Guide to Moffat, A Life of Cowper, A Life of William Nicholson the Galloway Poet, Sketches from Nature, The Scrap-Book, &c.*

MACDONALD, ETIENNE-JACQUES-JOSEPH-ALEXANDRE, *Duke of Tarentum*, was descended from a Scottish family, and was born in 1765 at Sancerre, in France. He entered the French army in 1784, and having embraced the principles of the Revolution, served in the army of the north as brigadier-general; but in 1795 was promoted for his bravery to the rank of general of division. In this capacity he commanded at Düsseldorf and Cologne. After serving in the army of the Rhine, he acted under Bonaparte in the army of Italy, and in 1798 became governor of the Roman States. Forced, however, in 1799 to retreat before Suwaroff and Melas, he was defeated by them at Trebia, and with great difficulty effected a conjunction with Moreau at Genoa. In the revolution of the 18th Brumaire, Macdonald ably seconded Bonaparte; and in 1800 was rewarded for his services with the command of an army of reserve in Switzerland. There he displayed great military skill in his passage of the Splügen. On his return to Paris in 1802, he was appointed French plenipotentiary at the court of Denmark, and at the expiry of this office, he was decorated with the star of a Grand Officer of the Legion of Honour. For his bold defence of Moreau, Macdonald forfeited the favour of Bonaparte. Yet in 1809, so brilliant was his success in defeating the enemy's centre at Wagram, that Napoleon acknowledged his bravery in presence of the army, and bestowed upon him the marshal's staff and the title of Duke of Tarentum. No less noted was his military prowess in the famous invasion of Russia, and in the battles of Lutzen, Bautzen, and Leipsic. During the Hundred Days, Macdonald lived in retirement. After the downfall of Napoleon he was appointed chancellor of the Legion of Honour, an office which he held till 1831. In 1825 he attended Charles X. to the coronation at Rheims, and afterwards visited Great Britain and Ireland. He died in 1840.

MACDUFF, a burgh of barony and seaport-town of Scotland, county of Banff, on the right bank of the Deveron, at its mouth, and connected with the town of Banff on the opposite bank by a stone bridge of seven arches. It has a town-hall, jail, an Established and a Free church, and an excellent harbour, by means of which a considerable coasting trade is carried on. It is included in the parliamentary burgh of Banff. Pop. (1851) 2527.

MACE, the external covering or arillode of the seed of the nutmeg, of a scarlet colour, and fatty, shining appearance. (See *Myristica moschata*, in BOTANY.) It is strongly aromatic and of a pungent acid taste. It is packed in bales, and imported from the Moluccas, where the best is to be found. The import trade in mace for home consumption for the three years ending with 31st December 1856, has been as follows:—in 1854, 25,584 lb.; in 1855, 28,563 lb.; in 1856, 27,299 lb. The present (1857) duty on mace is 1s. per lb.

MACEDO, JOSE AGOSTINHO DE, a Portuguese poet, was born about 1770. He studied for the church, became an Augustine monk, and in 1810 was chaplain to the Prince Regent of Portugal, and one of the most popular preachers in Lisbon. In 1811 he published *Reflections on the Episode of Adamastor in the Lusiad*, in which he convicted Camoens of plagiarism from the Italian poets. He also wrote an epic poem, *O Oriente* (The Orient), in celebration of the discovery of India; a didactic poem, entitled *A Meditação* (Meditation); a translation of Horace; and several controversial pamphlets. Macedo died in 1831.

MACEDONIA, or MACEDON, a celebrated kingdom of Macedonia antiquity, was bounded on the E. by the Ægean Sea, on the S. by Thessaly and Æpirus, on the W. by the Ionian Sea or Adriatic, on the N. at first by the river Strymon and the Scardian Mountains, but afterwards by the River Nessus or Nestus. In a direct line the whole country extended only 150 miles; but it was lengthened out to about three times that extent by the windings of the coast, in which almost every convenient situation was converted into a Grecian seaport. The country was naturally divided by the Thernaic and Strymonic gulfs, into the provinces of Pieria, Chalcis, and Pangæus. The middle region, which took its name from a city of Eubœa, whence it had been originally peopled, was very fertile and pleasant; and the interior, being diversified by lakes, rivers, and arms of the sea, was extremely convenient for inland navigation, whilst the towns of Amphipolis, Potidæa, Acanthus, and many others, afforded marts for the commerce of the republics of Greece, as well as of Thrace and Macedonia. On one side of this district were the mountains of Pangæus, and on the other the plains of Pieria. The Pangæan Mountains, which extended 90 miles towards the E. and the River Nessus, though proper neither for corn nor pasture, produced plenty of timber for ship-building; whilst the southern branches of the mountains contained rich veins of gold and silver. Pieria extended 50 miles along the Thernaic Gulf, as far as the confines of Thessaly and Mount Pindus.

In the most ancient times this country was called *Æm-* Different
thia, from Æmathius, one of its princes. The name of names.
Macedonia is said to have been derived from Macedo, a descendant of Deucalion; though others suppose it to have been only a corruption of *Mygdonia*, a district of the country. In those remote ages of antiquity, Macedonia, like most other countries of Europe, was divided into a great number of petty principalities, of which scarcely even the names are now known.

That section of the race which went under the name of *Macedonian*, and which afterwards swallowed up all the rest and became known as the *Macedonians*, had their origin at Ægæ or Edessa, corresponding with the site of the modern Vodhena. And though, in after times, the royal residence was removed to Pella, yet the original centre was always retained as the burial-place of their kings, and the hearth around which the national reverence and affection clung.

The origin of the Macedonian people and that of the Macedonian monarchy are quite distinct. The former have been regarded as of Illyrian, the latter of Hellenic race. We learn from Polybius, the best authority which we possess (xxviii., 8, 9), that the Macedonian language was different from the Illyrian,—a circumstance which, in the opinion of Mr Grote (*History of Greece*, vol. iv., p. 14), is sufficient to cast serious doubt on the supposed Illyrian descent of those races.

All the stories relative to the early history of the Macedonian monarchy—and they were various—agree in tracing the origin of the family to the Temenids of Argos. There is an air of genuineness about the tradition of Herodotus (viii., 137–138). According to this historian, Perdicas, a Temenid, with two brothers of the same race, being driven from their native Argos into Macedonia, were compelled, from straitened circumstances, to serve as shepherds to the petty King of Labæa. A prodigy happened to Perdicas, which at once indicated his future success, and led to his present dismissal by the Labæan. His escape being secured by the rising of a river, which was afterwards held sacred by the Macedonian kings, this hardy shepherd established himself near the garden of Midas, on Mount Bermius, and from him sprang the royal line of Edessa. It was a common Greek opinion, moreover, during the reign of Alexander, son of Amyntas, that the family of that prince was of Hellenic extraction; so much so, that he found a place

Macedonia. at the Olympic games, to which none but a genuine Greek could lay claim.

To command was the prerogative of the Greek mind, and for a courageous Argeian to acquire ascendancy and transmit authority over the Macedonian barbarians was doubtless a task of comparatively little difficulty. From the legend alluded to till the reign of Amyntas (520-500 B.C.) and his son Alexander (480 B.C.), we have nothing but a long blank. Names or dates there are none; yet, we can dimly infer the growing influence and importance of the Temenids. They acquire Pieria, a place of great importance, lying between Mount Bermius and the sea. Amyntas accordingly heired an extensive dominion on his coming to the throne. During his reign he kept up a friendly connexion with the Pisistratidæ at Athens, a relationship afterwards continued between his son Alexander and the Athenians. It was during the reign of Amyntas that Macedonia first became formally subject to the Persian power. Darius intrusted his officer Megabazus with the important task of ratifying the submission which Amyntas had proposed, and the Persian warrior and diplomatist fulfilled his mission so well, that after marrying the sister of Amyntas, he returned to his master with a new province added to his empire.

The Macedonians distinguished themselves in the time of the Persian invasion of Greece by furnishing their allies with 200,000 recruits; though some cities, particularly Potidæa, Olynthus, and Pallene, adhered to the Grecian interest. The last two were taken and razed, and the inhabitants massacred by the Persians; but Potidæa escaped by reason of the sea breaking into the Persian camp, where it did great damage. Alexander, however, afterwards thought proper to court the favour of the Greeks, by giving them intelligence of the time when Mardonius designed to attack them. The remaining transactions of this reign are entirely unknown, further than that the king enlarged his dominions as far as the river Nessus on the E., and the Axius on the W.

Reign of
Perdiccas
II.

Alexander I. was succeeded by his son Perdiccas II., who is said to have inherited his father's abilities, though not his integrity. From the duplicity with which he acted, both to the Greeks and the Persians, it does not appear, indeed, that he had much to boast of as to the latter quality. In the Peloponnesian war he espoused the cause of the Spartans against the Athenians, from whom he was in danger by reason of their numerous settlements on the Macedonian coast, and their great power by sea. For some time, however, he amused the Athenians with a show of friendship; but at last, under pretence of enabling Olynthus and some other cities to recover their liberties, he assisted in destroying the influence of the Athenians in those places, hoping to establish that of the Macedonians in its stead. But this design failed of success; the Olynthian confederacy was broken up; and the members of it became subject to Sparta, until at last, by the misfortune of that republic, they grew sufficiently powerful, not only to resist the encroachments of the Macedonians, but to make considerable conquests in their country.

Archelaus
I.

Perdiccas II. was succeeded about 416 B.C. by Archelaus I. He enlarged his dominions by the conquest of Pydna and other places in Pieria, though his ambition seems rather to have been to improve his dominions than greatly to extend them. He facilitated communication between the principal towns of Macedonia, by cutting straight roads through the greater part of the country; he built walls and fortresses in such places as afforded favourable situations; he encouraged agriculture and the arts, particularly those subservient to war; he formed magazines of arms; he raised and disciplined a considerable body of cavalry; and, in a word, he added more to the solid grandeur of Macedonia than had been done by all his predecessors

put together (*Thuc.*, ii. 100). Nor was he regardless of Macedonia. the arts of peace. His palace was adorned by the works of the Grecian painters. Euripides was long entertained at his court; Socrates was earnestly solicited to live there; men of merit and genius in the various walks of literature and science were invited to reside in Macedonia, and treated with distinguished regard by a monarch equally attentive to advance his own glory and promote the happiness of his subjects.

This great monarch died after a reign of six years, a space by far too short to accomplish the magnificent projects he had formed. After his death the kingdom fell under the power of usurpers, or of weak and wicked monarchs. A number of competitors constantly appeared for the throne; and these by turns called to their assistance the Thracians, Illyrians, Thessalians, the Olynthian confederacy, Athens, Sparta, and Thebes. Bardyllis, an active and daring chief, who, from being the head of a gang of robbers, had become sovereign of the Illyrians, entered Macedonia at the head of a numerous army; deposed Amyntas II., father of Philip; and set up in his stead one Argæus, who consented to become tributary to the Illyrians. Another candidate for the throne, named Pausanias, was supported by the Thracians; but, by the assistance of the Thessalians and Olynthians, Amyntas was at length enabled to resume the government. After his restoration, however, the Olynthians refused to deliver up several places of importance belonging to Macedonia, which Amyntas had either intrusted to their care, or which they had taken from his antagonist. Amyntas complained to Sparta, and that republic readily complied with his wishes. Two thousand Spartans, under the command of Eudamidas, were ordered into Macedonia, where they performed essential service. The appearance of a Spartan army at once encouraged the subjects and allies of the Olynthians to revolt; and the city of Potidæa, a place of great importance in the isthmus of Pallene, surrendered soon after his arrival in the country. Elated with his success, Eudamidas approached so near the city of Olynthus, that he was unexpectedly attacked, defeated, and killed, in a sally of the citizens. He was succeeded by Teleutias, brother of Agesilaus, who had under his command a body of ten thousand men, and was further assisted by Amyntas, king of Macedonia, and Derdas his brother, the governor or sovereign of the most westerly province of Macedonia, which abounded in cavalry. By these formidable enemies the Olynthians were discomfited in a series of battles, obliged to shut themselves up in their city, and prevented from cultivating their territory; upon which Teleutias advanced with his whole forces to invest the city itself. The Olynthians allowed them to come on, and the Lacedæmonians imprudently advanced under the towers and battlements of the city. The townsmen then mounted the walls, and discharged upon them a shower of darts, arrows, and other missile weapons, whilst the flower of the Olynthian troops, who had been purposely posted behind the gates, sallied forth and attacked them with the greatest fury. Teleutias, attempting to rally his men, was slain in the first onset; the Spartans who attended him were defeated, and the whole army dispersed with great slaughter, and obliged to shelter themselves in the towns of Acanthus, Apollonia, Spartolus, and Potidæa.

The Spartans, undismayed by this disaster, prosecuted the war with much spirit. The Olynthians held out for nine or ten months, but were at last obliged to submit on very humiliating conditions. They formally renounced all claim to the dominion of Chalcis, and ceded the Macedonian cities to their ancient governor; and in consequence of this, Amyntas left the city of Ægæ, or Edessa, where till now he had held his royal residence, and fixed it at Pella, a city of great strength and beauty, situate upon an eminence, which, together with a plain of considerable extent, was defended

Civil dis-
sensations.

Submission
of the Olyn-
thians.

Macedonia. by impassable morasses, and also by the rivers Axios and Lydias. It was distant about 15 miles from the Ægean Sea, with which it communicated by means of the above-mentioned rivers. It was originally founded by the Greeks who had conquered and peopled it; but, in consequence of the misfortunes of Olynthus, it now became, and continued ever after to be, the capital of Macedonia.

Pausanias; Amyntas being thus established in his dominions, continued to enjoy tranquillity during the remaining part of his life. The reign of his son Alexander was short, and disturbed by invasions of the Illyrians, from whom he was obliged to purchase a peace. He left behind him two brothers, Perdiccas and Philip, both very young, so that Pausanias again found means to usurp the throne, being supported not only by the Thracians, but by a considerable number of Greek mercenaries, as well as a powerful party in Macedonia itself. In this critical juncture, however, Iphicrates the Athenian happening to be on an expedition to Amphipolis, was so warmly addressed by Eurydice, the widow of Amyntas, in behalf of her two sons, whom she presented to him, that he interested himself in their behalf, and got Perdiccas, the eldest, established on the throne. During the minority of the young prince, however, his brother Ptolemy, who was his guardian, openly aspired to the throne; but he was deposed by the Theban general Pelopidas, who reinstated Perdiccas in his dominions, and in order to secure the dependence of Macedonia upon Thebes, carried along with him thirty Macedonian youths as hostages, amongst whom was Philip, the younger brother of the king. Perdiccas, elated by the protection of such powerful allies, now forgot Iphicrates and the Athenians, and even disputed with them the right to the city of Amphipolis, which had been decreed to them by the general council of Greece, but which his opposition rendered it impossible for them to recover. In a battle with the Illyrians, the Macedonians were defeated with the loss of 4000 men, and Perdiccas himself was taken prisoner, and soon afterwards died of his wounds.

State of the kingdom. The kingdom was now left in the most deplorable state. Amyntas, the legitimate heir to the throne, was an infant; the Thebans, in whom Perdiccas had placed so much confidence, were deprived of the sovereignty of Greece; the Athenians, justly provoked at the ungrateful behaviour of the late monarch, showed a hostile disposition; the Illyrians ravaged the western, and the Pæonians the northern quarter of the kingdom; the Thracians still supported the cause of Pausanias, and proposed to send him into Macedonia at the head of a numerous army; whilst Argæus, the former rival of Amyntas, renewed his pretensions to the throne, and by flattering the Athenians with the hopes of recovering Amphipolis, easily induced them to support his claims, in consequence of which they fitted out a fleet, having on board 3000 heavily armed soldiers, which they sent to the coast of Macedonia.

Arrival of Philip in Macedonia. Philip, the late king's brother, no sooner heard of his defeat and death, than he set out privately from Thebes, and on his arrival in Macedonia found matters in the situation which we have just described. Fired with an insatiable ambition, it is probable that from the very first moment he had resolved to seize the kingdom for himself; yet it was necessary at first to pretend that he assumed the throne only to preserve it for his nephew. Philip, as has already been mentioned, had been carried off as a hostage by Pelopidas, but for a long time past had remained in such obscurity that historians are not agreed as to his place of residence, some placing him in Thebes, and others in Macedonia. It is certain, however, that from the age of fifteen he had been very much in the family of Epaminondas, from whose lessons he could not but derive the greatest advantage. It is also probable that he accompanied this celebrated general in many of his expeditions; and it is certain that, with an attendance suitable to his rank, he visited most of

the principal republics, and paid great attention to their institutions, both civil and military. Having easy access to whomsoever he pleased, he cultivated the friendship of the first people in Greece. Even in Athens, where no good will subsisted to Macedonia, the philosophers Plato, Isocrates, and Aristotle, cultivated his acquaintance; and the connection he formed with the principal leaders of that republic in the early period of his life no doubt contributed greatly to the accomplishment of the designs in which he afterwards proved so successful.

Philip's return to Macedonia instantly changed the face of affairs. The Macedonian army, though defeated, was not entirely destroyed; and the remainder of them secured themselves in the fortresses which had been built by Archelaus. There were also considerable garrisons in the fortresses and walled towns scattered over the kingdom; and the Illyrians, who had made war only for the sake of plunder, soon returned home to enjoy the fruits of their victory. His other enemies, the Thracians and Pæonians, were much less formidable than the Illyrians, being still in a very rude and uncivilized state, incapable of uniting under one head in such a manner as to bring any formidable army into the field. Whilst the Illyrians therefore gave up the campaign through mere caprice and unsteadiness, Philip himself applied to the Pæonians, and by fair promises and flattery, prevailed upon them to desist. The King of Thrace, by means of a sum of money, was easily induced to abandon the cause of Pausanias; so that Philip, freed from these barbarians, was now at liberty to oppose the Athenians, who supported Argæus, and threatened a very formidable invasion.

The appearance of the Athenian fleet before Methone, and the presence of Argæus at the head of a numerous army in Pieria, filled the whole country with consternation; and Philip, who was by no means deficient in the talents necessary to recommend himself to the good graces of the people, took the opportunity of getting Amyntas set aside and himself declared king, for which proceeding indeed the danger of the times afforded a very plausible pretext. In the meantime, Argæus advanced with his Athenian allies towards Edessa, or Ægæ, but was defeated by Philip in a general engagement, in which Argæus himself, with the flower of his army, was cut in pieces, and the rest taken prisoners. This first instance of success contributed greatly to raise the spirits of Philip's party; and he himself took care to improve it in the best manner possible. Having made a great number of prisoners, both Macedonians and Athenians, he determined, by his treatment of them, to ingratiate himself with both parties. The former were called into his presence, and, after a gentle reprimand, admitted to swear allegiance to him, after which they were distributed throughout the army. The Athenians were entertained at his table, and dismissed without ransom, and their baggage was restored to them. The prisoners were just allowed time to return to their native city, and to spread abroad the news of Philip's generosity, when they were followed by ambassadors from Macedonia with proposals for peace. As he knew that the loss of Amphipolis had greatly irritated them, he now thought proper to renounce his jurisdiction over that city. It was accordingly declared free and independent, and subject only to the government of its own free and equitable laws. This prudent conduct, together with his kind treatment of the prisoners, so wrought upon the minds of the Athenians, that they consented to the renewal of a treaty which had formerly subsisted between them and his father Amyntas. Thus he found means to remove all jealousy of his ambition, and to induce them to engage in a ruinous war with their allies, which occupied their attention until Philip had an opportunity of getting matters so well established that it was impossible to overthrow him.

Affairs of the kingdom retrieved by him.

Philip assumes the sovereignty.

Macedonia. The new king being thus at liberty to regulate his domestic concerns, began to circumscribe the power of his chiefs and nobles, who, especially in the more remote provinces, paid very little regard to the authority of the kings of Macedonia. To counteract the ambition of these chiefs, Philip chose a body of the bravest Macedonian youths, whom he entertained at his own table, and honoured with many testimonies of his friendship, giving them the title of his "companions," and allowing them constantly to attend him in war and hunting. Their intimacy with the sovereign, which was considered as a sure indication of their merit, obliged them to use superior diligence in all the severe duties of military discipline; so that they thus formed a useful seminary for future generals, by whom both Philip and Alexander were afterwards greatly assisted in their conquests.

The Pæonians and Illyrians. Whilst the king thus took the best methods to render himself secure at home and formidable abroad, the Pæonians again began to make incursions into the kingdom. The death of Agis, their king, however, who was a man of great military skill, deprived them of almost all power of resistance when they were attacked. Philip, in consequence, overran their country with little opposition, and reduced them to the state of tributaries to Macedonia. No sooner was this accomplished, than he undertook a winter's campaign against the Illyrians, who had long been the natural enemies of Macedonia. After an ineffectual negotiation, he was met by their leader Bardyllis at the head of a considerable body of infantry, but with only 400 horse. They made a gallant resistance for some time; but being unable to contend with so skilful a general as Philip, they were defeated with the loss of 7000 men, amongst whom was Bardyllis, who fell at the age of ninety.

By this disaster the Illyrians were so much disheartened, that they sent ambassadors to Philip, humbly begging for peace upon any terms. The conqueror granted them the same conditions which had been imposed upon the Pæonians, viz., becoming tributary, and yielding up to him a considerable part of their country. This territory, hitherto unconnected with any foreign power, gradually sunk into such absolute dependence upon Macedonia, that many ancient geographers supposed it to be a province of that country.

Designs and proceedings of Philip.
B.C. 357. Philip had no sooner reduced the Illyrians, than he began to put in execution greater designs than any which he had yet attempted. Sensible of the importance of Amphipolis as a maritime station, he directed all his efforts towards the reduction of that city. It had indeed been declared independent by Philip himself in the beginning of his reign; but this was only to prevent a rupture with the Athenians, who still asserted their right to it as an ancient colony, though, by reason of the perfidy of Charidemus, a native of Eubœa, they had hitherto failed in their attempts to recover it. The Amphipolitans, however, having once enjoyed the sweets of liberty, prepared to maintain themselves in their independence. In the meantime, the hostile designs of Philip, which all his precaution had not been able to conceal, alarmed the inhabitants to such a degree that they thought proper to put themselves under the protection of the Olynthians. By them they were readily received into the confederacy, and, trusting to the strength of their new allies, behaved in such an insolent manner to Philip, that he was not long in finding a specious pretext for hostility; on which the Olynthians, greatly alarmed, sent ambassadors to Athens, requesting their assistance against such a powerful enemy. Philip, however, justly alarmed at such a formidable conspiracy, sent agents to Athens with such expedition that they arrived there before anything could be concluded with the Olynthian deputies. Having gained over the popular leaders and orators, he deceived and flattered the magistrates and senate in such an artful manner, that a negotiation was instantly set on

foot, by which Philip engaged to conquer Amphipolis for Macedonia. the Athenians, upon condition that they surrendered to him the strong fortress of Pydna, a place which he represented as of much less importance to them; promising also to confer upon them many other advantages, which, however, he did not specify at that time. Thus the Athenians, deceived by the perfidy of their own magistrates, elated with the hopes of recovering Amphipolis, and outwitted by the superior policy of Philip, rejected with disdain the proffers of the Olynthians.

The ambassadors of Olynthus returned home highly disgusted with the reception they had met with, but had scarcely time to communicate their news to their countrymen, when the ambassadors of Philip arrived at Olynthus. He pretended to condole with them on the affront they had received at Athens, but also testified his surprise that they should court the assistance of that distant and haughty republic, when they could avail themselves of the powerful kingdom of Macedonia, which wished for nothing more than to enter into equal and lasting engagements with their confederacy. As a proof of his moderation and sincerity, he offered to put them in possession of Anthemus, an important town in the neighbourhood, of which the Macedonians had long claimed the jurisdiction; making many other fair promises, and, amongst the rest, that he would reduce for them the cities of Pydna and Potidæa, which he chose rather to see in dependence on Olynthus than Athens. Thus he prevailed upon the Olynthians not only to abandon Amphipolis, but to assist him with all their power in the execution of his designs.

Philip now lost no time in executing his purposes against Amphipolis, and pressed the city so closely that the people were glad to apply to the Athenians for relief. Accordingly, they despatched two of their most eminent citizens, Hierax and Stratocles, to represent the danger of an alliance between Philip and the Olynthians, and to profess their sorrow for having so deeply offended the parent state. This representation had such an effect, that though the Athenians were then deeply engaged in the Social War, they would probably have paid some attention to the Amphipolitans, had not Philip taken care to send them a letter with fresh assurances of friendship, acknowledging their right to Amphipolis, and which he hoped shortly to put into their hands in terms of his recent agreement. By these specious pretences the Athenians were persuaded to pay as little regard to the deputies of the Amphipolitans as they had already done to those of the Olynthians; so that the city, unable to defend itself alone against so powerful an enemy, at last surrendered at discretion in the year 357 before Christ.

Finding that it was not his interest at this time to fall out with the Olynthians, Philip cultivated the friendship of that republic with great assiduity; and took the cities of Pydna and Potidæa, which he readily yielded to the Olynthians, though they had given him but little assistance in the reduction of these places. Potidæa had been garrisoned by the Athenians, and them the artful king sent back without ransom, lamenting the necessity of his affairs, which obliged him, contrary to his inclination, to oppose their republic. Though this was rather too gross, the Athenians were then so much engaged with the Social War, that they had not leisure to attend to the affairs of other nations. Philip made the best use of his time, and next projected the conquest of the gold mines of Thrace. These had formerly been worked by colonies from Thasos and Athens; but the colonists had long since been expelled by the barbarous Thracians, who knew not how to make use of the treasure they were in possession of. Philip took the trouble to descend into the mines himself, in order to inspect the works; and, having caused them to be repaired, planted a Macedonian colony at Crenidæ, bestowed upon it the name

Macedonia. of Philippi, and drew annually from the gold mines to the value of nearly 1000 talents, or L.200,000 sterling, an immense sum in those days. The coins struck here were likewise called Philippi.

The affairs of Thessaly settled. Philip having obtained this valuable acquisition, next undertook to settle the affairs of Thessaly, where everything was in the greatest confusion. This country had been formerly oppressed by Alexander, tyrant of Pheræ, after whose death three others appeared, viz., Tissiphornus, Pitholaus, and Lycophron, the brothers-in-law of Alexander, who had likewise murdered him. By the united efforts of the Thessalians and Macedonians, however, these usurpers were easily overthrown, and effectually prevented from making any disturbances for the future; and the Thessalians, from a mistaken gratitude, surrendered to Philip all the revenues arising from their fairs and towns of commerce, as well as all the conveniences of their harbours and shipping; a concession which Philip took care to secure in the most effectual manner.

Combination against Philip. B.C. 356. Having now not only established his sovereignty in the most effectual manner, but rendered himself very powerful and formidable to his neighbours, Philip determined to enjoy some repose from his fatigues. Having formed an alliance with Arybbas, King of Epirus, he, in the year 357 B.C., married Olympias, the sister of that prince; a match thought the more eligible, as the kings of Epirus were supposed to be descended from Achilles. The nuptials were solemnized with great pomp at Pella, and several months were spent in shows and diversions, during which Philip showed such an extreme proneness to vice of every kind, as disgraced him in the eyes of his neighbours, and most probably laid the foundation of his future domestic unhappiness. So much was this behaviour of the Macedonian monarch taken notice of by the neighbouring states, that the Pæonians and Illyrians threw off the yoke, engaging in their schemes the King of Thrace; and, notwithstanding the insane state of that prince, their designs were now carried on with more judgment than was usual with barbarians. Philip, however, notwithstanding his dissipation, got warning of his danger in sufficient time to prevent the evil consequences which might have ensued had the confederates had time to bring their schemes to a proper bearing. Early in the spring of 356 he took the field with the flower of the Macedonian troops. Having marched in person against the Pæonians and Thracians, he despatched Parmenio, his best general, into Illyria. Both enterprises proved successful; and whilst Philip returned victorious from Thrace, he received an account of the victory gained by Parmenio; a second messenger informed him of a victory gained by his chariot at the Olympic games; and a third announced that Olympias had been delivered of a son at Pella.

Alexander the Great. B.C. 356. This was the celebrated Alexander, to whom the diviners prophesied the highest prosperity and glory, as being born in such auspicious circumstances. A short time after the birth of Alexander, Philip wrote a letter to the philosopher Aristotle, whom he chose as preceptor to his son. The letter was written with great brevity, containing only the following words:—"Know that a son is born to us. We thank the gods not so much for their gift, as for bestowing it at a time when Aristotle lives. We assure ourselves that you will form him a prince worthy of his father, and worthy of Macedonia."

Phocian war. B.C. 357-346. Philip next set about the further enlargement of his territories, which were already very considerable. He easily perceived that the affairs of the Greeks were coming to a crisis, and he determined to watch the issue of their mutual dissensions. He found occasion of interference for the first time with the affairs of Greece, at the outbreak of the *Phocian* or Sacred War. The true cause of the persecution of the Phocians, it is believed, was the hatred with which that

people had inspired the Thebans by refusing them aid in Macedonia, their recent contest with Sparta. Private individuals also of the neighbouring communities advanced doubtful motives of personal offence. Such were the passions which moved the Thebans to a course of rash and cruel warfare, which eventually wrought their own ruin, and led to the destruction of Grecian freedom. Prompted by ambition and avarice, they aspired to absolute control in the Amphictyonic Council, and to undivided authority over the temple of Delphi and its treasures, then in the rightful possession of the Phocians. A quarrel was sought with this unoffending people. They were charged by their rapacious neighbours with having cultivated lands which had been devoted to the god of Delphi. Ascendant in the council, the Thebans easily found means of criminating the Phocians; they accordingly condemned that much-wronged people to pay a fine, for the liquidation of which their entire country was pronounced forfeit to the god. The Phocians boldly seized upon Delphi, and appealed to arms (B.C. 357); and under the encouragement of Athens and Sparta, they engaged in a long and sanguinary war with Thebes and her allies. It was during this contest that Philip first gained a footing in Thessaly. This he effected by aiding certain of the Thessalian nobles against the tyrants of Pheræ, who had the Phocians and Athenians for their allies. This movement brought Philip into collision with the Athenians. When that republic attempted, together with the people of Methone, to thwart the influence of Philip on the coasts of Thrace, he suddenly made a descent upon that place, and made it his own after a determined siege, in which he lost an eye by an arrow shot.

During all this time the Phocian war raged with the greatest fury, and involved in it all the states of Greece. Lycophron, one of the Thessalian tyrants whom Philip had formerly deprived of his authority, had again found means to re-establish himself; and his countrymen having taken part with the Phocians, Lycophron called in Onomarchus, the Phocian general, to protect him against the power of Philip, by whom he was sensible that he would soon be attacked. The king accordingly marched into Thessaly with a considerable army, and defeated Phyllus, the brother of Onomarchus, whom the latter had sent into the country with a detachment of 7000 men. After this he besieged and took the city of Pegasus, driving the enemy towards the frontiers of Phocis. Onomarchus then advanced with the whole army; and Philip, though inferior in numbers, did not decline the engagement. The Phocians at first gave ground, on which the Macedonians pursued, in good order; but coming near a precipice, on the top of which Onomarchus had posted a detachment of soldiers, the latter rolled down stones and fragments of the rock in such a manner as did dreadful execution, and threw them into the utmost disorder. Philip, however, rallied his troops with great presence of mind, and prevented the Phocians from gaining any further advantage; saying, as he withdrew his troops, that they did not retreat through fear, but only like rams, in order to strike with the greater vigour. Nor was he long before he made good his assertion; for, having recruited his army with the greatest expedition, he returned into Thessaly at the head of 20,000 foot and 500 horse, and was there met by Onomarchus. The Macedonians at this time were superior in number to their enemies; and Philip, moreover, took care to remind them that their quarrel was that of heaven, and that their enemies had been guilty of sacrilege, by profaning the temple of Delphi. That they might be still more animated in the cause, he put crowns of laurel on their heads. Thus fired with enthusiasm, and having besides the advantage of numbers, the Phocians were altogether unable to withstand them. They threw away their arms and fled towards the sea, where they expected to have been relieved by Chares, who, with the Athenian fleet, was

Macedonia. near to the shore; but in this they were disappointed, for he made no attempt to save them. Upwards of 6000 perished in the field of battle or in the pursuit, and 3000 were taken prisoners. The body of Onomarchus being found amongst the slain, was, by order of Philip, hung upon a gibbet, as a mark of infamy, on account of his having polluted the temple; and the bodies of the rest were thrown into the sea, as being all partakers of the same crime.

The Olynthians now applied to Athens for aid against the ambitious schemes of their former ally of Macedonia: a call to which the Athenians, moved by the voice of Demosthenes, gave a ready response, and sent successive reinforcements to their relief. Philip ultimately defeated this allied force, and subsequently captured Olynthus (B.C. 347). The Athenians and Macedonians concluded a treaty of peace the following year, from which the Phocian allies of Athens, by the unprincipled dexterity of Philip, were excluded. That brave and unfortunate people now found themselves at the mercy of their more powerful enemies. The Thebans, who had borne an unequal share in the conflict, now in their hour of need solicited the willing aid of Philip. Passing the unguarded defiles of Thermopylæ, he made a swift descent upon Greece proper, and from the misconduct and treachery of the Phocian leaders, was entirely successful. The Phocians were compelled to surrender at mercy, and the Amphictyons, in solemn council, decreed that their towns should be destroyed, their inhabitants disarmed and heavily assessed, and that their Delphian privileges and votes in the council should revert to the pious Macedonian. Thus ended the Sacred War (B.C. 346).

Athens and Macedonia.

Athens and Macedon were now gradually approaching a collision: the former had for a lengthened period struggled for the independence of Greece, while the latter aspired to general supremacy in her government and councils. But Athens had not only to maintain a contest with the Macedonian,—she had discontented factions within her own borders more dangerous to her safety than even her northern foe. There was an aristocratic and a democratic party. The voice of the former was for peace, that of the latter for war. The peace party regarded resistance against such odds as fatal. They looked on the democrats with contempt; and with a painful assurance of the utterly degenerate character of that faction, probably saw no cure for the evils of intestine strife except a diversion against Persia, headed by Philip of Macedon. The peace party was led by the tried patriots Isocrates and Phocion; but there were men of a very different stamp who found shelter among them. The pay of Philip had wrought its way among the base and the treacherous. Chief of these hirelings were the orators Æschines and Demades. The democratic party, on the other hand, eager for the license and plunder which hang in the skirts of war, were guided by the base Chares and the mercenary Charidemus. But this party was fortunate enough to have among its ranks a patriot of generous enthusiasm and of noble independence, who, while he was alarmed at the unscrupulous ambition of Philip, was yet determined to offer a brave resistance to the formidable front of the aspiring king. This was none other than the celebrated Demosthenes. (See DEMOSTHENES.)

After the Phocian war had been brought to a close, Philip directed his efforts to the consolidation of his empire in the north of Greece. The towns of the Propontis and the Thracian Chersonese he soon made his own. He invested Perinthus and Byzantium; but the voice of Demosthenes was now raised against him. Phocion, with an armament of Athenians, bore down upon him and compelled him to raise the siege of those cities. But the triumph of the orator and the disappointment of the prince were alike momentary. The one had to act upon a fickle and divided multitude, the other upon splendidly disciplined armies. The plans of the one were open to all, those of

the other were shrouded in the profoundest mystery till the moment for action brought them to the light. In the following year, appointed by the obsequious Amphictyons to chastise the people of Amphissa for cultivating certain devoted lands, Philip, after reducing that city, seized Elateia at the head of 32,000 veteran soldiers. Alarm and dismay seized the Athenians, but the eloquence of Demosthenes, by gaining over the Thebans and Corinthians, revived the expiring courage of the republicans. Consummate generalship and discipline, however, proved more than a match for numerical superiority, and the fatal battle of Chæroneia (B.C. 338) saw the confederates defeated, and the liberties of ancient Greece extinguished for ever. Nothing attested more the efficiency of Philip's improved *phalanx* than this bloody victory. (For a full account of this military organization, see ARMY; also, Grote's *History of Greece*, vol. xii., c. 92.) After the battle, Philip immediately stopped the slaughter; and (if we may credit the story) when, on revisiting the field after a night's carouse, he beheld the Sacred Band of the Thebans lying in swathes where the scythe of war had mowed them down, he burst into tears, and exclaimed,—“Perish they who imagine those to have done or suffered wrong.” This burst of generous feeling did not, however, extend to the Thebans who survived. The hostile party in their city he treated with great harshness and severity, while he conducted himself towards the Athenians with the utmost clemency. (See Grote's *History of Greece*, vol. xi., c. 90.)

Battle of Chæroneia.
B.C. 338.

To all appearance the great object of Philip's ambition was now within his grasp. In consideration of the wrongs which Persia had inflicted upon Greece, it was resolved in the assembly that war should be declared on a national scale against that power, with the King of Macedonia as the commander of the expedition. But another was destined to enjoy the laurels which Philip had all but won. While celebrating the nuptials of his daughter Cleopatra with the King of Epirus, a young Macedonian of his own body-guard, named Pausanias, stabbed him to the heart. As the assassin died on the spot, his motive for the deed could not be ascertained; but it was generally supposed to have arisen from personal revenge, on the king's refusal to redress a foul insult received from the uncle of the queen. Some say he was secretly urged to commit the deed by Olympias (now superseded by the new queen, Cleopatra), and her son Alexander, who had quarrelled with his father a short time previously. Thus fell this aspiring king at the early age of forty-seven (B.C. 336), full of life and energy, with a vista of glory opening up before him. Despite the scantiness of our information respecting him, the great outlines of his character and achievements can be easily traced. He raised the Macedonian kingdom from a narrow territory to a vast possession, reaching from the shores of the Propontis to the Thermaic Gulf. He was possessed of fine political and military talent, and fortune smiled on his endeavours; but the splendour of his name is dimmed by base perjury and gross intemperance. Theopompus, his contemporary and warm admirer, stigmatizes his conduct as follows:—“His Macedonian and Grecian body-guard, 800 in number, was a troop in which no decent man could live; distinguished indeed for military bravery and aptitude, but sated with plunder, and stained with such shameless treachery, sanguinary rapacity, and unbridled lust, as befitted only Centaurs and Læstrygons.” There can be little doubt that the hopeless degeneracy of Grecian spirit and national feeling acted as a foil to Philip's brilliant talent for conquest.

No sooner did the news of Philip's death reach Athens, than, as if all danger had been past, the inhabitants showed the most extravagant signs of joy. Demosthenes and his party put on chaplets of flowers, and behaved as if they had gained a great victory. Phocion reproved them for this madness, bidding them remember that “the army which

Joy of the Athenians.

Macedonia had beaten them at Cheronæa was lessened but by one." This reproof, however, had very little effect. The people heard with pleasure all the harsh things which the orators could say of the young Alexander, King of Macedonia, whom they represented as a giddy, wrong-headed boy, ready to grasp all things in his imagination, and able to perform nothing. The affairs of Macedonia indeed were in a very distracted state on the accession of Alexander; for all the neighbouring nations had the same notion of the young king with the Athenians, and, being irritated by the usurpations of Philip, immediately revolted, and the states of Greece entered into a confederacy against him. The Persians had been contriving how to transfer the war to Macedonia; but as soon as the news of Philip's death reached them, they behaved as if all danger had been terminated. At the same time, Attalus, one of the Macedonian commanders, aspired to the crown, and sought to draw off the soldiers from their allegiance.

Alexander
declared
general of
Greece.
B.C. 336.

In the councils held upon this occasion, Alexander's best friends advised him rather to make use of dissimulation than force, and to try to cajole those whom they thought he could not subdue. These advices, however, were ill suited to the temper of their monarch. He thought that vigorous measures only were proper, and therefore immediately led his army into Thessaly. Here he harangued the princes so effectually, that he thoroughly gained them over to his interest, and was by them declared general of Greece; upon which he returned to Macedonia, where he caused Attalus to be seized and put to death.

In the spring of the next year (335 before Christ), Alexander resolved to subdue the Triballians and Illyrians, who inhabited the countries now called Bulgaria and Sclavonia, and had been very formidable enemies to the Macedonian power. In this expedition he discovered, though then but twenty years of age, a surprising degree of military knowledge. Having advanced to the passes of Mount Hæmus (the Balkan), he learned that the barbarians had posted themselves in the most advantageous manner. Upon the tops of the cliffs, and at the head of every passage, they had placed their carriages and waggons in such a manner as to form a kind of parapet, with their shafts inwards, that when the Macedonians should have half ascended the rock, they might be able to push these heavy carriages down upon them; and they reckoned the more upon this contrivance, because of the close order of the phalanx, which, they imagined, would be terribly exposed by the soldiers wanting room to stir, and thereby to avoid the falling waggons. But Alexander, having directed his heavy-armed troops to march, gave orders that, where the way would permit, they should open to the right and left, and suffer the carriages to go through; but that, in the narrow passes, they should throw themselves on their faces with their shields behind them, that the carts might run over them. This had the desired effect, and the Macedonians reached the enemy's works without the loss of a man. The dispute was then quickly decided. The barbarians were driven from their posts with great slaughter, and left behind them a considerable booty for the conquerors.

Thebes
taken and
destroyed.

The next exploits of Alexander were against the Getæ, the Tanlantii, and some other nations inhabiting the country upon the other side of the Danube. These he also overcame; showing in all his actions the most perfect skill in military affairs, joined with the greatest valour. In the meantime, however all Greece was thrown into commotion by a report which had been confidently spread abroad, that the king was dead in Illyria. The Thebans, on this news, seized Amyntas and Timolaus, two eminent officers in the Macedonian garrison which held their citadel, dragged them to the market-place, and put them to death without either form of process or any crime being alleged against them. Alexander, however, did not suffer the Thebans to

remain long in their mistake. He marched with such expedition, that in seven days he reached Pallene in Thessaly; and in six days more he entered Bœotia, before the Thebans had any intelligence of his having passed the Straits of Thermopylæ. Even then they would not believe that the king was alive, but insisted that the Macedonian army was command by Antipater, or by one Alexander the son of Æropus. The rest of the Greeks, however, were not so hard of belief, and therefore sent no assistance to the Thebans, who were thus obliged to bear the consequences of their own folly and obstinacy. Their city was taken by assault, and the inhabitants were for some hours massacred without distinction of age or sex, after which the houses were demolished, excepting that of Pindar, the famous poet, which was spared out of respect to the merit of its owner, and because he had celebrated Alexander, King of Macedonia. The lands, except those destined to religious uses, were shared amongst the soldiers, and all the prisoners sold as slaves, by which 440 talents were brought into the king's treasury.

By this severity the rest of the Grecian states were so thoroughly humbled, that they thought no more of making any resistance, and Alexander had nothing further to hinder him from pursuing his favourite project of invading Asia. Very little preparation was necessary for the Macedonian monarch, who went as to an assured conquest, and reckoned upon being supplied chiefly by the spoils of his enemies. Historians are not agreed as to the number of his army. Arrian says that there were thirty thousand foot and five thousand horse. Plutarch tells us that according to a moderate computation, Alexander had thirty thousand foot and five thousand horse; and that according to the largest estimate, he had thirty-four thousand foot and four thousand horse. As to his fund for the payment of the army, Aristobolus says it was but seventy talents; and Onesicritus, who was also present in this expedition, not only takes away the seventy talents, but affirms that the king was two hundred in debt. As for provisions, there was just sufficient for a month and no more; and to prevent disturbances, Antipater was left in Macedonia with twelve thousand foot and fifteen hundred horse.

The army having assembled at Amphipolis, Alexander marched thence to the mouths of the River Strymon; then crossing Mount Pangæus, he took the road to Abdera. Crossing the River Ebrus, he proceeded through the country of Pædis, and in twenty days reached Sestos; thence he marched to Eleusa, where he sacrificed on the tomb of Protesilaus, because he was the first amongst the Greeks who at the siege of Troy set foot upon the Asiatic shore. He did this that his landing might be more propitious than that of the hero to whom he sacrificed, who was soon afterwards slain. The greatest part of the army, under the command of Parmenio, embarked at Sestos, on board of a hundred and sixty galleys of three benches of oars, besides small craft. Alexander himself sailed from Eleusa; and when he was in the middle of the Hellespont, offered a bull to Neptune and the Nereids, pouring forth at the same time a libation from a golden cup. When he drew near to the shore, he launched a javelin, which stuck in the earth; then, in complete armour, he leaped upon the strand; and having erected altars to Jupiter, Minerva, and Hercules, he proceeded to Ilium. Here again he sacrificed to Minerva; and taking down some arms which had hung in the temple of that goddess since the time of the Trojan war, he consecrated his own in their stead. He sacrificed also to the ghost of Priam, to avert his wrath on account of the descent which he himself claimed from Achilles.

Alexander
sets out on
his expedition.

In the meantime the Persians had assembled a great army in Phrygia, amongst whom was one Memnon, a Rhodian, the best officer in the service of Darius. Memnon gave it as his opinion that they should burn and destroy all the country round, that they might deprive the Greeks of

Granicus.

Macedonia. the means of subsisting, and then transport a part of their army into Macedonia. But the Persians, depending on their cavalry, rejected this salutary advice, and posted themselves along the river Granicus, in order to await the arrival of the Greeks. Alexander, as soon as he had performed all the ceremonies which he judged necessary, marched directly towards the enemy. In the engagement which ensued on the banks of that river, the Persians were defeated, and Alexander became master of all the neighbouring country, which he immediately began to take care of, as if it had been part of his hereditary dominions. The city of Sardis was immediately delivered up; and here Alexander built a temple to Jupiter Olympius. After this, he restored the Ephesians to their liberty, ordered the tribute which they formerly paid to the Persians to be applied towards the rebuilding of the magnificent temple of Diana, and having settled the affairs of the city, marched against Miletus. This place was defended by Memnon with a considerable body of troops, who had fled thither after the battle of Granicus, and therefore made a vigorous resistance. The fortune of Alexander, however, prevailed; and the city was soon reduced, though Memnon with part of the troops escaped to Halicarnassus. After this, the king dismissed his fleet,—a proceeding for which various causes have been assigned, though it is probable that the chief reason was to show his army that their only resource now lay in subverting the Persian empire.

Subsequent proceedings.

Almost all the cities between Miletus and Halicarnassus submitted as soon as they heard that the former was taken; but Halicarnassus, where Memnon commanded with a very numerous garrison, made an obstinate defence. Nothing, however, was capable of resisting the Macedonian army. Memnon was at last obliged to abandon the place; upon which Alexander took and razed the city of Tralles in Phrygia, received the submission of several princes tributary to the Persians; and having destroyed the Marmarians, a people of Lycia, who had fallen upon the rear of his army, put an end to the campaign; after which he sent home all the new-married men, which endeared him more to his soldiers than almost any other action of his life.

As soon as the season would permit, Alexander quitted the province of Phaselus; and having sent part of his army through the mountainous country to Perga, by a short but difficult road, took his route by a certain promontory, where the way is altogether impassable except when the north winds blow. At the time of the king's march the south wind had held for a long time; but of a sudden it changed, and blew from the north so violently, that, as he and his followers declared, they obtained a safe and easy passage through divine assistance. He continued his march towards Gordium, a city of Phrygia; the enemy having abandoned the strong pass of Telmissus, through which it was necessary for him to march. When he arrived at Gordium, and found himself under the necessity of staying there some time till the several corps of his army could be reunited, he expressed a strong desire of seeing Gordius's chariot, and the famous knot in the harness, of which such strange stories had been published to the world. The cord in which this knot was tied was made of the inner rind of the cornel tree; and no eye could perceive where it began or ended. Alexander, when he could find no possible way of untying, and yet was unwilling to leave it tied, lest it should cause some fears in the breasts of his soldiers, is said by some authors to have cut the cords with his sword, saying, "It matters not how it is undone." A great tempest of thunder, lightning, and rain, happening the succeeding night, it was held declarative of the true solution of this knot, and that Alexander would become master of Asia.

The king having left Gordium, marched towards Cilicia, where he was attended with his usual good fortune, the Persians abandoning all the strong passes as he advanced.

As soon as he entered the province, he received advice that Arsames, whom Darius had made governor of Tarsus, was about to abandon it, and that the inhabitants were very apprehensive that he intended to plunder them before he withdrew. To prevent this, the king marched incessantly, and arrived just in time to save the city. But his saving it had well nigh cost him his life; for, either through the excessive fatigue of marching, as some say, or, according to others, by his plunging when very hot into the River Cydnus, which, as it runs through thick shades, has its waters excessively cold, he fell into such a distemper as threatened immediate dissolution. Philip the Acarnanian alone preserved self-command enough to examine the nature of the king's disease, the worst symptom of which was a continual shivering, which he removed by means of a potion, and in a short time the king recovered his usual health.

Alexander's sickness and recovery.

Soon after Alexander's recovery, he received the agreeable news that Ptolemy and Asander had defeated the Persian generals, and made great conquests on the Hellespont; and a little after that he met the Persian army at Issus, commanded by Darius himself. A bloody engagement ensued, in which the Persians were defeated with great slaughter (B.C. 333). The consequences of this victory were very advantageous to the Macedonians. Amongst the number of those places which, within a short space after the battle of Issus, sent deputies to submit to the conqueror, was the city of Tyre. The king, whose name was Azelmicus, was absent in the Persian fleet; but his son was amongst the deputies, and was very favourably received by Alexander. The king probably intended to confer particular honours upon the city of Tyre, for he acquainted the inhabitants that he would come and sacrifice to the Tyrian Hercules, the patron of their city, to whom they had erected a most magnificent temple. But these people, like most other trading nations, were far too suspicious to think of admitting such an enterprising prince with his troops within their walls. Alexander then assembled a council of war, in which he insisted strongly on the disaffected state of Greece (for most of the Grecian states had sent ambassadors to Darius, to enter into a league with him against the Macedonians), the power of the Persians by sea, and the folly of carrying on the war in distant provinces, whilst Tyre was left unreduced behind them; he also remarked, that if once this city was subdued, the sovereignty of the sea would be transferred to them, because it would fix their possession of the coasts; and as the Persian fleet was composed chiefly of tributary squadrons, those tributaries would fight the battles, not of their late, but of their present masters.

For these reasons the siege of Tyre was resolved on. Tyre taken The town was not taken, however, without great difficulty, and destroyed. which provoked Alexander to such a degree that he treated the inhabitants with the greatest cruelty. After the reduction of Tyre, Alexander, though the season was already far advanced, resolved to make an expedition into Syria; and in his way thither proposed to chastise the Jews, who had highly offended him during the siege of Tyre; for when he sent to them to demand provisions for his soldiers, they answered, that they were the subjects of Darius, and bound by oath not to supply his enemies. The king, however, was pacified by their submission, and not only pardoned them, but conferred many privileges upon them.

From Jerusalem Alexander marched directly to Gaza, Egypt submitted. The only place in that part of the world which still held out for Darius. The governor Batis defended the place with great valour, and several times repulsed his enemies; but at last it was taken by storm, and all the garrison slain to a man; and this secured to Alexander an entrance into Egypt, which having before been very impatient of the Persian yoke, admitted the Macedonians peaceably. Here the king laid the foundations of the city of Alexandria,

Macedonia. which for many years afterwards continued to be the capital of the country. Whilst he remained here, he also formed the singular design of visiting the temple of Jupiter Ammon. As to the motives by which he was induced to take this extraordinary journey, authors are not agreed; but certain it is, that he hazarded himself and his troops in the highest degree, there being two dangers in this march, which, with the example before him of Cambyses, who lost the greater part of his army in it, might have terrified anybody but Alexander. The first was the want of water, which, in the sandy deserts surrounding the temple, is nowhere to be found; the other, the uncertainty of the road from the fluctuation of the sands, which, changing their situation every moment, leave the traveller neither a road to walk in, nor a mark to march by. These difficulties, however, Alexander overcame, though not without a miraculous interposition, as is pretended by all his historians.

Battle of Arbela.

Alexander having consulted the oracle, and received a favourable answer, returned to pursue his conquests. Having settled the government of Egypt, he appointed the general rendezvous of his forces at Tyre. Here he met with ambassadors from Athens, requesting him to pardon such of their countrymen as he found serving the enemy. The king being desirous to oblige such a famous state, granted their request, and also sent a fleet to the coast of Greece, to prevent the effects of some commotions which had lately happened in Peloponnesus. He then directed his march to Thapsacus; and having passed the Euphrates and Tigris, met with Darius near Arbela (*Erbil*), where the Persians were again overthrown with prodigious slaughter, and by this victory Alexander became in effect master of the Persian empire.

Babylon, Susa, and Persepolis reduced.

After this important victory, Alexander marched directly to Babylon, which was immediately delivered up, the inhabitants being greatly disaffected to the Persian interest. After thirty days' stay in this country, the king marched to Susa, which had already surrendered to Philoxenus; and here he received the treasures of the Persian monarch, amounting, according to the most generally received account, to 50,000 talents. Having received also at this time a supply of 6000 foot and 500 horse from Macedonia, he set about reducing the nations of Media, amongst whom Darius had retired. He first reduced the Uxians, and having forced a passage to Persepolis, the capital of the empire, he, like a barbarian, destroyed the stately palace there, a pile of building not to be equalled in any part of the world, after having given up the city to be plundered by his soldiers. In the palace he found 120,000 talents, which he appropriated to his own use, and caused immediately to be carried away upon mules and camels; for he had such an extreme aversion to the inhabitants of Persepolis, that he determined to leave nothing valuable in that city.

Alexander pursues Darius, who is murdered by Bessus.

During the time that Alexander remained at Persepolis, he received intelligence that Darius remained at Ecbatana, the capital of Media, upon which he pursued him with the greatest expedition, marching at the rate of nearly 40 miles a day. In fifteen days he reached Ecbatana, where he was informed that Darius had retired from thence five days before, with an intent to pass into the remotest provinces of his empire. At this place the Thessalian cavalry and many of the allies, having terminated their service, were dismissed with full pay. Some who preferred it were enrolled as volunteers. The king bought the horses of the Thessalians, who, with the rest of the Greeks, were conducted in safety to the Mediterranean.

On receiving fresh information concerning the state of Darius' affairs, the king again set out in pursuit of him, advancing as far as Rhagæ, a city one day's journey from the Caspian Gates. There he understood that Darius had some time before passed those straits; and this information leaving him again without hopes, he halted for five

days. Oxidates, a Persian whom Darius had left prisoner at Susa, was made governor of Media, whilst the king departed on an expedition into Parthia. The Caspian Gates he passed immediately without opposition, and he then gave directions to his officers to collect a quantity of provisions sufficient to serve his army on a long march through a wasted country. But before his officers could accomplish these commands, the king received intelligence that Darius had been murdered by one of his own subjects, Bessus, the governor of Bactria.

As soon as Alexander had collected his forces together, Hyrcania and settled the government of Parthia, he entered Hyrcania; and having, according to his usual custom, committed the greater part of his army to the care of Craterus, he, at the head of a choice body of troops, passed through certain craggy roads, and, before the arrival of Craterus, who took an open and easy path, struck the whole provinces with such terror, that all the principal places were immediately put into his hands; and soon afterwards the province of Aria also submitted, and the king continued Satibarzanes, the governor, in his employment. The reduction of this province completed the conquest of Persia; but the ambition of Alexander to become master of every nation of which he had the least intelligence, induced him to enter the country of Mardi, merely because its rocks and barrenness had hitherto prevented any one from conquering, or, indeed, from attempting to conquer it. This conquest however, he easily accomplished, and obliged the whole nation to submit to his pleasure. But in the meantime disturbances began to arise in Alexander's new empire, and amongst his troops, which all his activity could not thoroughly suppress. He had scarcely left the province of Aria, when he received intelligence that the traitor Bessus had caused himself to be proclaimed king of Asia by the name of Artaxerxes; and that Satibarzanes had joined him, after having massacred all the Macedonians who had been left in the province. Alexander appointed one Arsames governor in the room of Satibarzanes, and marched thence with his army against the Zarangæ.

The immense treasure which the Macedonians had acquired in the conquest of Persia now began to affect their discipline. The king himself was of a most generous disposition, and liberally bestowed his gifts on those around him; but they made a bad use of his bounty, and foolishly indulged in those vices by which the former possessors of that wealth had lost it. The king did all in his power to discourage the lazy and inactive pride which now began to show itself amongst his officers; but neither his discourses nor his example had any considerable effect. The form of his civil government resembled that of the ancient Persian kings; in military affairs, however, he strictly preserved the Macedonian discipline; but then he made choice, out of the provinces, of 30,000 boys, whom he caused to be instructed in the Greek language, and directed to be brought up in such a manner as that from time to time he might with them recruit the phalanx. The Macedonians observed with great concern these extraordinary measures, which suited very ill with their gross understandings; for, after all the victories they had gained, they expected to be absolute lords of Asia, and to possess not only the riches of its inhabitants, but to rule the inhabitants themselves; whereas they now found that Alexander meant no such thing, but that, on the contrary, he conferred governments, offices at court, and all other marks of confidence and favour, indiscriminately both on Greeks and Persians. From this time also the king seems to have given proofs of a cruelty which he had never shown before. Philotas, his most intimate friend, was seized, tortured, and put to death, for a conspiracy of which it could never be proved that he was guilty; and soon afterwards Parmenio, the father of the former, and some others, were executed with-

Macedonia. out any crime at all, real or alleged. These things very much disturbed the army. Some of them wrote home to Macedonia respecting the king's suspicions of his friends, and his disposition to hunt out enemies at the very extremities of the world. Alexander having intercepted some of these letters, and procured the best information he could concerning their authors, picked out these dissatisfied people, and having disposed them into a corps, gave it the title of the "turbulent battalion," hoping by this means to prevent the spirit of disaffection from pervading the whole army. As a further precaution against any future conspiracy, Alexander thought fit to appoint Hephæstion and Clytus generals of the auxiliary horse; being apprehensive, that if this authority was lodged in the hands of a single person, it might prompt him to dangerous undertakings, and at the same time furnish him with the means of carrying them into execution. To keep his forces in action, he suddenly marched into the country of the Euergetæ, or Benefactors, and found them full of the kind and hospitable disposition for which that name had been bestowed on their ancestors by the first Cyrus; he therefore treated them with great respect, and at his departure added some lands to their dominions, which lay contiguous, and which for that reason they had requested of him.

Alexander spent the greater part of the autumn and winter in the reduction of the region around Dragiana, the modern Afghanistan, Scistan, and western Cabool. Any resistance he met with was fitful and desultory; but his soldiers suffered severely from cold and want of food. Arrian remarks, after his own fashion,—“Alexander moved forward not a whit the less; with difficulty, indeed, through deep snow, and without provisions; but still he moved on.” He founded a new city called *Alexandria ad Caucasum* (Begram? See Masson's *Narrative of Journeys in Afghanistan, &c.*, vol. iii., c. 7), at one of the southern passes of the Hindoo-Koosh. Here he planted 7000 old Macedonian soldiers as colonists. By a fifteen days' march through snow he crossed the vast mountain range of the Hindoo-Koosh, and entered the region of Bactria.

Bessus reduced and put to death.

Bessus, who had assumed the name of Artaxerxes, when he was assured that Alexander was marching towards him, immediately began to waste all the country between Paropamisus and the River Oxus, which river he passed with all his forces, and then burned all the vessels he had made use of for transporting them, retiring to Nautaca, a city of Sogdia, fully persuaded that, by the precautions he had taken, Alexander would be compelled to give over his pursuit. This conduct of his, however, disheartened his troops, and gave the lie to all his pretensions; for he had affected to censure Darius' conduct, and had charged him with cowardice, in not defending the River Euphrates and Tigris, whereas he now quitted the banks of the most defensible river perhaps in the whole world. As to his hopes, though it cannot be said they were ill founded, yet they proved absolutely vain; for Alexander, continuing his march, notwithstanding the hardships his soldiers sustained, reduced all Bactria under his obedience, particularly the capital Bactria and the strong castle Aornus. In the latter he placed a garrison under the command of Archelaus, but the government of the province he committed to Artabazus. He then continued his march to the River Oxus, on the banks of which, when he arrived, he found it three-quarters of a mile in breadth, its depth more than proportional to its breadth, its bottom sandy, its stream so rapid as to render it almost unnavigable, and neither boat nor tree in its neighbourhood; so that the ablest commanders in the Macedonian army were of opinion that the army would be obliged to march back. The king, however, having first sent away, under a proper escort, all his infirm and worn-out soldiers, that they might be conducted safely to the seaports, and thence transported

to Greece, devised a method of passing this river without either boat or bridge, by causing the hides which covered the soldiers' tents and carriages to be stuffed with straw, and then tied together, and thrown into the river. Having crossed the Oxus, he marched directly towards the camp of Bessus, where, when he arrived, he found it abandoned; but at the same time received letters from Spitamenes and Dataphernes, who were the chief commanders under Bessus, signifying, that if he would send a small party to receive Bessus, they would deliver him into his hands; which they did accordingly, and the traitor was immediately put to death, after cruel mutilation.

A supply of horses having now arrived, the Macedonian Alexander cavalry were remounted. Alexander continued his march passes the to Maracanda, the capital of Sogdia, whence he advanced Indus. to the River Iaxartes. Here he performed extraordinary exploits against the Scythians, from whom, however, though he overcame them, his army suffered much; and the revolted Sogdians, being headed by Spitamenes, gave him a great deal of trouble. Here also he married Roxana, the daughter of Oxyartes, a prince of the country whom he had subdued. But during these expeditions, the king greatly disgusted his army by the murder of his friend Clytus in a drunken quarrel at a banquet, and by his extravagant vanity in claiming divine honours. At last he arrived at the River Indus, where Hephæstion and Perdikkas had already provided a bridge of boats for the passage of that river. He then ordered the vessels of which his bridge had been composed to be taken to pieces, that they might be brought to the Hydaspes (*Jelum*) where he was informed that Porus with a great army lay encamped to dispute his passage.

Alexander experienced no resistance till he met the brave Indian prince, Porus, who, with a formidable force, stood on the further side of a river, prepared to dispute his passage. The Macedonians, by a series of skilful manoeuvres, eluded the watchfulness of the Indians, crossed the river at a point above where the army lay, and completely overthrew Porus and his brave host. This gigantic prince, who was mounted on an elephant, moved about among his scattered troops with signal spirit and intrepidity, cheering on the dispirited, and reviving the expiring courage of the wavering. He saw two of his sons fall by his side, and had himself received a severe wound; yet he fought on almost single-handed with the fierce energy of proud despair. It was with considerable difficulty that Alexander succeeded in preserving the life of this invincible hero. When Porus was brought before him, Alexander, over whose passionate nature external impressions exercised a strong influence, was much struck with his handsome figure and undaunted mien. He showed this prince the utmost generosity, not only by reinstating him in his kingdom, but also by extending its boundaries; and Porus proved in return a faithful ally to Alexander. “This was,” says Grote, “the greatest day of Alexander's life, if we take together the splendour and difficulty of the military achievement, and the generous treatment of his conquered opponent.”

Passes the Hydaspes, and defeats Porus.

To perpetuate the memory of this victory, Alexander ordered two cities to be erected; one, on the field of battle, which he named Nicæa, the other on the opposite side of the river, which he called Bucephala, in honour of his horse Bucephalus, who died here, as Arrian says, of mere old age, being on the verge of thirty. All the soldiers who fell in the battle he buried with great honours, offered solemn sacrifices to the gods, and exhibited pompous shows on the banks of the Hydaspes, where he had forced his passage. He then entered the territories of the Glaucæ, in which there were thirty-seven good cities and a multitude of populous villages. All these were delivered up to him without fighting; and as soon as he received them, he presented them

Macedonia. to Porus, and having reconciled him to Taxiles, he sent the latter home to his own dominions. About this time ambassadors arrived from several Indian princes with their submissions; and Alexander having conquered the dominions of another Porus, which lay on the Hydraotes, a branch of the Indus, added them to those of Porus his ally.

In the middle of all this success, however, news arrived that the Cathei, Oxydracæ, and the Malli, the most warlike nations of India, were confederated against the Macedonians, and had drawn together a great army. The king immediately marched to give them battle, and in a few days reached a city called Sangala, seated on the top of a hill, and having a fine lake behind it. Before this city the confederate Indians lay encamped, having three circular lines of carriages locked together, and their tents pitched in the centre. These defences being forced, they took refuge within their walls, and resolved to evacuate by night. Informed by deserters of this project, Alexander succeeded in defeating it. Next day he stormed the town, killing, as Arrian records, 17,000 Indians, and taking 70,000 captives. His own loss was less than 100 killed and 1200 wounded. After razing Sangala, he annexed the territory to the kingdom of his Indian ally.

Alexander, still unsated with conquest, now prepared to pass the Hyphasis (*Sutlege*). The chief reason which induced him to think of this expedition, was the information he had received of the state of the countries beyond that river. He was told that they were in themselves rich and fruitful; that their inhabitants were not only a very martial people, but very civilized; that they were governed by the nobility, who were themselves subject to the laws; and that as they lived in happiness and freedom, it was likely they would fight obstinately in defence of those blessings. He was further told, that amongst these nations there were the largest, strongest, and most useful elephants bred and tamed; and was therefore fired with an earnest desire of reducing such a bold and brave people under his rule, and of attaining to the possession of the many valuable things that were said to be amongst them. As exorbitant, however, as his personal ambition was, he found it impossible to infuse any part of it into the minds of his soldiers, who were so far from wishing to triumph over new and remote countries, that they were highly desirous of leaving those that they had already conquered. When, therefore, they were informed of the king's intentions, they privately consulted together in the camp about the situation of their own affairs. At this consultation, the gravest and best of the soldiers lamented that they were made use of by their king, not as lions, who fall fiercely upon those who have injured them, but as mastiffs, who fly upon and tear those who are pointed out to them as enemies. The rest were not so modest, but expressed themselves roundly against the king's humour for leading them from battle to battle, from siege to siege, and from river to river; protesting that they would follow him no farther, nor lavish their blood any longer to purchase for him the fame he coveted. Alexander had too much penetration not to perceive that his troops were very uneasy. He therefore harangued them from his tribunal; but though his eloquence was great, and the love his army had for him was yet very strong, they did not relent. For some time the soldiers remained sullen and silent; and at last turned their eyes on Cœnus, an old and experienced general, whom Alexander loved, and in whom the army put great confidence. He had the generosity to undertake their cause, and told Alexander frankly, "that men endured toil in hopes of repose; that the Macedonians were already much reduced in their numbers; that of those who remained, the greater part were invalids; and that they expected, in consideration of their former services, that he would now lead them back to their native country, an act which, of all others, would

most contribute to his own great designs, since it would encourage the youth of Macedonia, and even of all Greece, to follow him in whatever new expedition he pleased to undertake." The king was far from being pleased with this speech of Cœnus, and much less with the disposition of his army, which continued in a deep silence. He therefore dismissed the assembly. But next day he called another, in which he told the soldiers plainly that he would not be driven from his purpose; that he would proceed in his conquests with such as should follow him voluntarily; and that, as for the rest, he would not detain them, but would leave them at liberty to go home to Macedonia, where they might publish, "that they had left their king in the midst of his enemies." Even this expedient had no success; his army was so thoroughly tired with long marches and desperate battles, that they were determined to advance no further; upon which Alexander retired to his tent, where he refused to see his friends, and evinced the same gloomy temper that reigned amongst his troops.

For three days things remained in this situation. At last Alexander the king suddenly appeared; and, as if he had been fully determined to pursue his first design, he gave orders to sacrifice for the good success of his new undertaking. But Aristander, the augur, reported that the omens were altogether inauspicious; upon which the king said, that since his proceeding farther was neither pleasing to the gods nor grateful to his army, he would return. When this was rumoured amongst the army, they assembled in great numbers about the royal tent, saluting the king with loud acclamations, wishing him success in all his future designs, and giving him at the same time hearty thanks, inasmuch as "he who was invincible had suffered himself to be overcome by their prayers." A stop being thus put to the conquests of Alexander, he determined to make the Hyphasis the boundary of his dominions; and having erected twelve altars of an extraordinary magnitude, he sacrificed upon them, after which he exhibited shows in the Grecian manner; and, having added all the conquered country in these parts to the dominions of Porus, he began to return. Having arrived at the Hydaspes, he made the necessary preparations for sailing down the Indus to the ocean. For this purpose, he ordered vast quantities of timber to be felled in the neighbourhood of the Hydaspes, through which he was to sail into the Indus; and by the beginning of November, he, with a fleet of 2000 boats, began his voyage down the Hydaspes. Craterus and Hephestion, with their divisions, moved down the banks of the river. The king kept on board the fleet, which was commanded by Nearchus. The main stream of the Indus was gradually reached, down which they sailed to the ocean. The entire voyage occupied nine months, from November 326 B.C. to August 325 B.C. But it is not to be supposed that Alexander contented himself with the unbroken monotony of this tedious expedition. All tribes bordering on the river which did not offer voluntary submission, were attacked, subdued, and slaughtered. Among these were the Malli. Attacking this brave people with his accustomed energy, Alexander drove them within the walls of their strongest city. Having pursued them to the gates, the king, in his hot impatience at the tardy arrival of the troops with the scaling-ladders, managed to mount the wall, and after striking down its defenders, flung himself into the fortress, where he made his way, single-handed, for a time against all opposition. He was on the point of falling, however, from a severe wound, when his soldiers dashed in, rescued their brave general, and took the citadel. The Indians were now slaughtered without mercy; but Alexander continued for some time in a very dangerous condition. However, he at last recovered his strength, and showed himself again to his army, which filled them with the greatest joy.

On the king's return to Pattala, he resolved to sail down

Sangala
taken and
razed.

The troops
refuse to
proceed
further.

At last Alexander
consents to
return.
Voyage
down the
Indus,
B.C. 325.

Macedonia. the other branch of the Indus, that he might see whether it was more safe and commodious for his fleet than that which he had already tried ; and for this he had very good reasons. He had resolved to send Nearchus with his fleet by sea, through the Persian Gulf, up the River Tigris, to meet him and his army in Mesopotamia ; but as the possibility of this voyage depended on the ceasing of the etesian winds, there was a necessity for laying up the fleet till the season should prove favourable. Alexander, therefore, sailing through this branch of the Indus, sought on the sea-coast for bays and creeks, where his fleet might anchor in safety ; he also caused pits to be sunk, which might be filled with fresh water for the use of his people, and took all imaginable precautions for preserving them in ease and safety till the season would allow them to continue their voyage. In this he succeeded to his wish ; for he found this branch of the river Indus, at its mouth, spread over the plain country, and forming a kind of lake, in which a fleet might ride with safety. He therefore appointed Leonatus, and a part of his army, to carry on such works as were necessary, causing them to be relieved by fresh troops as often as there was occasion ; then having given his last instructions to Nearchus, he departed with the rest of the army, in order to march back to Babylon.

His march through Gedrosia.

Before the king's departure, many of his friends advised him against the route which he intended to take. They told him that nothing could be more rash or dangerous than this resolution. They informed him, that the country through which he was to travel was a wild uncultivated desert ; that Semiramis, when she led her soldiers this way out of India, brought home but twenty of them ; and that Cyrus attempting to do the same, returned with only seven. But all this was so far from deterring Alexander, that it more than ever determined him to pursue no other route. As soon, therefore, as he had put things in order, he marched at the head of a sufficient body of troops to reduce the Oritæ, who had never vouchsafed either to make their submission or to court his friendship. Their territories lay upon the other side of a river called Arabis, which Alexander crossed so speedily, that they had no intelligence of his march ; whereupon most of them quitted their country, and fled into the deserts. Their capital he found so well situate, that he resolved to take it out of their hands, and to cause a new and noble city to be founded there, the care of which he committed to Hephæstion. Then he received the deputies of the Oritæ and Gedrosi ; and having assured them that if the people returned to their villages, they should be kindly treated, and having appointed Apollophenes president of the Oritæ, and left a considerable body of troops under Leonatus to secure their obedience, he began his march through Gedrosia. In this march his troops suffered incredible hardships. The road was very uncertain and troublesome, on account of its lying through deep and loose sands, rising in many places into hillocks, which forced the soldiers to climb, at the same time that it sunk under their feet ; there were no towns, villages, nor places of refreshment, to be met with ; so that, after excessive marches, they were forced to encamp among these dry sands. As to provisions, they hardly met with any during their whole march. The soldiers were therefore obliged to kill their beasts of carriage ; and such as were sent to bring some corn from the sea-side, were so grievously distressed, that, though it was sealed with the king's signet, they cut open the bags, choosing rather to die a violent death for disobedience than perish by hunger. When the king, however, was informed of this, he freely pardoned the offenders ; he was also forced to accept the excuses that were daily made for the loss of mules, horses, &c., which were in truth eaten by the soldiers, and their carriages broken in pieces to avoid further trouble. As for water, their want of it was a great misfortune, and yet their finding it in plenty was sometimes a greater ; for,

as in the one case they perished with thirst, so in the other Macedonia they were thrown into dropsies, and rendered incapable of travel. Frequently they met with no water for the whole day together ; sometimes they were disappointed of it at night, in which case, if they were able, they marched on ; so that it was common with them to travel 30, 40, 50, or even 60 miles without encamping. Through these hardships numbers were obliged to fall into the rear ; and of these many were left behind, and perished ; for indeed scarcely any of them ever joined the army again. Their miseries, however, they sustained with incredible patience, being encouraged by the example of their king, who, on this occasion, suffered greater hardships than the meanest soldier in his army.

At last they arrived at the capital of Gedrosia, where they refreshed themselves, and staid some time ; after which they marched into Caramania, which being a very plentiful country, made them ample amends for the hardships and fatigues which they had sustained. Here they were joined, first by Craterus with the troops under his command, along with a number of elephants ; then came Stasanor, president of the Arians, and Pharismenes, the son of Phrataphernes, the governor of Parthia. They brought with them camels, horses, and other beasts of burden, in vast numbers ; having foreseen that the king's march through Gedrosia would be attended with the loss of the greater part, if not all, of the cavalry and beasts belonging to his army. During Alexander's stay in Caramania, he redressed the injuries of his people, who had been grievously oppressed by their governors during his absence. Here also he was joined by his admiral, Nearchus, who brought with him an account that all under his command were in perfect safety and in excellent condition ; intelligence with which the king was mightily pleased, and, after having bestowed on him singular marks of his favour, sent him back to the navy. Alexander next set out for Persia, where great disorders had been committed during his absence. These he also redressed, and caused the governor to be crucified ; appointing in his room Peucestas, who had saved his life when he fought singly against a whole garrison, as above related. The new governor was no sooner invested with his dignity than he laid aside the Macedonian garb, and put on that of the Medes, being the only one of Alexander's captains who, by complying with the manners of the people he governed, gained their affection.

Whilst Alexander visited the different parts of Persia, he took a view, amongst the rest, of the ruins of Persepolis, where he is said to have expressed great sorrow for the destruction he had formerly occasioned. From Persepolis, he marched to Susa, where he gave an extraordinary loose to pleasure, resolving to make himself and his followers some amends for the difficulties which they had hitherto undergone, purposing at the same time so effectually to unite his newly-conquered with his hereditary subjects, that the jealousies and fears which had hitherto tormented both should no longer subsist. With this view he married two wives of the blood-royal of Persia—Barsine or Statira, the daughter of Darius, and Parysatis, the daughter of Ochus. Drypetis, another daughter of Darius, he gave to Hephæstion ; Amastrine, the daughter of Oxyartes, the brother of Darius, married Craterus ; and to the rest of his friends, to the number of eighty, he gave other women of the highest quality. All these marriages were celebrated at once, Alexander himself bestowing fortunes upon them. He likewise directed that an account should be taken of the number of his officers and soldiers who had married Asiatic wives ; and though they appeared to be ten thousand, yet he gratified each of them according to his rank. He next resolved to pay the debts of his army, and thereupon issued an edict directing every man to register his name, and the sum he owed ; an order with which the soldiers complying

His proceedings in Persia.

Macedonia. slowly, from an apprehension that there was some design against them, Alexander ordered tables heaped with money to be set in all quarters of the camp, and caused every man's debts to be paid on his bare word, without even making any entry of his name, though the whole sum amounted to twenty thousand talents. On such as had distinguished themselves in an extraordinary manner he bestowed crowns of gold. Peucestas received the first, Leonatus the second, Nearchus the third, Onesicritus the fourth, Hephæstion the fifth, and the rest of his guards had each of them one. After this he made other dispositions for conciliating, as he supposed, the differences amongst his subjects. He reviewed the thirty thousand youths whom at his departure for India he had ordered to be taught Greek and the Macedonian discipline, expressing high satisfaction at the fine appearance they made, which rendered them worthy of the appellation he bestowed on them, that of *Epigoni*, or successors. He promoted also, without any distinction of nation, all those who had served him faithfully and valiantly in the Indian war. When all these regulations were made, he gave the command of his heavy-armed troops to Hephæstion, and ordered him to march directly to the banks of the Tigris; whilst in the meantime a fleet was equipped for carrying the king and the troops which he retained with him down to the ocean.

Death of Alexander. B.C. 323. Thus ended the exploits of Alexander, the greatest conqueror that ever the world saw, at least with respect to the rapidity of his conquests. In the course of twelve years he had brought under his subjection Egypt, Libya, Asia Minor, Syria, Phœnicia, Palestine, Babylonia, Persia, with part of India and Tartary. Still, however, he meditated greater things. He had now got a great taste for maritime affairs, and is said to have meditated a voyage to the coasts of Arabia and Ethiopia, and thence round the whole continent of Africa to the Straits of Gibraltar. But of this there is no great certainty, though that he intended to subdue the Carthaginians and Italians is more than probable. All these designs, however, were frustrated by his death, which happened at Babylon in the year 323 B.C. He is said to have received several warnings of his approaching fate, and to have been advised to avoid that city, which advice he either despised or could not follow. He died of a fever, after eight days' illness, without naming any successor; having only given his ring to Perdiccas, and left the kingdom, as he said, "to the strongest."

The character of this great prince has been variously represented; but most historians seem to have looked upon him rather as an illustrious madman than one upon whom the epithet of Great could be properly bestowed. From a careful observation of his conduct, however, it must appear that he possessed not only a capacity to plan, but likewise to execute, the greatest enterprises which ever entered into the mind of any of the human race. From whatever cause the notion originated, it is plain that he imagined himself a divine person, and born to subdue the whole world; and extravagant and impracticable as this scheme may appear at present, it cannot at all be looked upon in the same light in the age of Alexander. The Greeks were in his time the most powerful people in the world in respect to their skill in the military art, and the Persians were the most powerful with respect to wealth and numbers. The only other powerful nations in the world were the Carthaginians, Gauls, and Italian nations. From a long series of wars which the Carthaginians carried on in Sicily, it appeared that they were by no means capable of contending with the Greeks, even when they had an immense superiority of numbers; and much less could they have sustained an attack from the whole power of Greece and Asia united. The Gauls and Italians were indeed very brave, and of a martial disposition; but they were barbarous, and could not have resisted armies well-disciplined, and under the command of such a skilful leader as Alexander. Even long

after this time, it appeared that the Romans themselves could Macedonia. not have resisted the Greeks, since Regulus, after having defeated the Carthaginians, and reduced them to the utmost distress, was totally unable to resist a Carthaginian army commanded by a Greek general, and trained to Greek discipline.

Thus it appears that the scheme of Alexander cannot by any means be accounted that of a madman, or of one who projects great things without judgment, and the means necessary to execute them. If from his actions we consider the end which he most probably had in view could his scheme have been accomplished, we shall find it not only the greatest, but the best, which can possibly be imagined. He did not conquer to destroy, enslave, or oppress, but to civilize and to unite the whole world as one nation. No sooner was a province conquered than he took care of it as if it had been part of his paternal inheritance. He allowed not his soldiers to oppress and plunder the Persians, which they were very much inclined to do; on the contrary, by giving in to the oriental customs himself, he strove to extinguish that inveterate hatred which had so long subsisted between the two nations. In the Scythian countries which he subdued he pursued the same excellent plan. His courage and military skill, in which he never was excelled, were displayed, not with a view to rapine or desultory conquest, but to civilize and induce the barbarous inhabitants to employ themselves in a more proper way of life. Amidst the hardships of a military life, obstinate sieges, bloody battles, and dear-bought victories, he still respected the rights of mankind, and practised the mild virtues of humanity. The conquered nations enjoyed their ancient laws and privileges; the rigours of despotism were softened; arts and industry encouraged; and the proudest Macedonian governors compelled, by the authority and example of Alexander, to observe the rules of justice towards their meanest subjects. To bridle the fierce inhabitants of the Scythian plains, he founded cities and established colonies on the banks of the Iaxartes and Oxus; and those destructive campaigns usually ascribed to his restless activity and blind ambition appeared to the discernment of this extraordinary man, not only essential to the security of the conquests which he had already made, but necessary for the more remote and splendid expeditions which he still purposed to undertake, and which he performed with singular boldness and unexampled success.

He was of a low stature, and somewhat deformed; but the activity and elevation of his mind animated and ennobled his frame. By a life of continual labour, and by an early and habitual practice of the gymnastic exercises, he had hardened his body against the impressions of cold and heat, hunger and thirst, and prepared his robust constitution for bearing such exertions of strength and activity as have appeared incredible to the undisciplined softness of modern times. In generosity and in prowess he rivalled the greatest heroes of antiquity; and in the race of glory, having finally outstripped all competitors, became ambitious to surpass himself. His superior skill in war gave uninterrupted success to his arms; and his natural humanity, enlightened by the philosophy of Greece, taught him to improve his conquests to the best interests of mankind. In his extensive dominions he built or founded not less than seventy cities; the situation of which, being chosen with consummate wisdom, tended to facilitate communication, to promote commerce, and to diffuse civilization through the greatest nations of the earth. It may be suspected, indeed, that he mistook the extent of human power, when in the course of one reign he undertook to change the face of the world; and that he miscalculated the stubbornness of ignorance and the force of habit, when he attempted to enlighten barbarism, to soften servitude, and to transplant the improvements of Greece into an African and Asiatic soil, where they have never been known to flourish. Yet

Macedonia. let not the designs of Alexander be too hastily accused of extravagance. Whoever seriously considers what he actually performed before his thirty-third year, will be cautious of determining what he might have accomplished had he reached the ordinary term of human life. His resources were peculiar to himself; and such views as well as actions became him, as would have become none besides. In the language of a distinguished historian, "he seems to have been given to the world by a peculiar dispensation of Providence, being a man like to none other of the human kind."

Causes of the dissolution of his empire.

With the death of Alexander fell also the glory of the Macedonians, who very soon relapsed into a situation as bad as, or perhaps worse than, that in which they had been before the reign of Philip. This was occasioned principally by his not having distinctly named a successor, and having no child of his own come to the years of discretion to whom the kingdom might seem naturally to belong. The ambition and jealousy of his mother Olympias, of his queen Roxana, and especially of the great commanders of his army, not only prevented a successor from being ever named, but occasioned the death of every person, whether male or female, who was in the least related to Alexander. To have a just notion of the origin of these disturbances, it is necessary, in the first place, to understand the state of Macedonian affairs at the time of Alexander's death.

When Alexander set out for Asia, he left Antipater in Macedonia, to prevent any disturbances that might arise either there or in Greece. The Greeks, even during the lifetime of Alexander, bore the superiority which he exercised over them with great impatience; and, though nothing could be more gentle than the government of Antipater, yet he was exceedingly hated, because he obliged them to be quiet. One of the last actions of Alexander's life set all Greece in a flame. He had, by an edict, directed all the cities of Greece to recall their exiles; which edict, when it was published at the Olympic games, created much confusion. Many of the cities were afraid that when the exiles returned they would change the government; most of them doubted their own safety if the edict took effect; and all of them held this peremptory decree to be a total abolition of their liberty. No sooner, therefore, did the news of Alexander's death arrive than they prepared for war.

In Asia the state of things was not much better; not indeed through any inclination of the conquered countries to revolt, but through the dissensions amongst the commanders. In the general council which was called soon after the death of Alexander, it was at last agreed, or rather commanded by the soldiers, after much confusion and altercation, that Aridaeus, the brother of Alexander, who had always accompanied the king, and had been wont to sacrifice with him, should assume the sovereignty. This Aridaeus was a man of slender parts and judgment, not naturally, but by the wicked practices of Olympias, who had given him poisonous draughts in his infancy, lest he should stand in the way of her son Alexander, or any of his family; and for this, or some other reason, Perdiccas, Ptolemy, and most of the cavalry officers, resented his promotion to such a degree that they quitted the assembly, and even the city. However, Meleager, at the head of the phalanx, vigorously supported their first resolution, and threatened loudly to shed the blood of those who affected to rule over their equals, and to assume a kingdom which nowise belonged to them. Aridaeus was accordingly arrayed in royal robes, had the arms of Alexander put upon him, and was saluted by the name of Philip, to render him more popular. Thus were two parties formed, at the head of which were Meleager and Perdiccas, both of them pretending vast concern for the public good, yet at bottom desiring nothing more than their own advantage. Perdiccas was a man of high birth, and had a supreme com-

mand in the army, was much in favour with Alexander, and one in whom the nobility had placed great confidence. Meleager had become formidable by the phalanx being on his side, and having the nominal king entirely in his power; for Aridaeus, or Philip, was obliged to comply with whatever he thought proper, and publicly declared that whatever he did was by the advice of Meleager; so that he made his minister accountable for his own schemes, and nowise endangered himself. The Macedonians also, besides their regard for the deceased king, soon began to entertain a personal love for Philip on account of his moderation.

It is remarkable, however, that notwithstanding all the favours which Alexander had conferred upon his officers, and the fidelity with which they had served him during his life, only two of them were attached to the interests of his family after his death. These were Antipater and Eumenes the Cardian, whom he had appointed his secretary. Antipater, as we have already seen, was embroiled with the Greeks, and could not assist the royal family, who were in Asia; and Eumenes had not as yet sufficient interest to form a party in their favour. In a short time, however, Perdiccas prevailed against Meleager, and caused him to be murdered; by which means the supreme power for a time fell into his hands. His first step, in consequence of this power, was to distribute the provinces of the empire amongst the commanders, in order at once to prevent competitors, and to satisfy the ambition of the principal leaders of the army. Aridaeus, and the son of Roxana, born after the death of his father, were to enjoy the regal authority. Antipater had the government of the European provinces. Craterus received the title of Protector. Perdiccas was made general of the household troops, in the room of Hephaestion. Ptolemy, the son of Lagus, obtained Egypt, Libya, and that part of Arabia which borders upon Egypt. Cleomenes, a man of infamous character, whom Alexander had appointed receiver-general in Egypt, was made Ptolemy's deputy. Leomedon had Syria; Philotas, Cilicia; Python, Media; Eumenes, Cappadocia, Paphlagonia, and all the country bordering on the Euxine Sea, as far as Trapezus; but these were not yet conquered, so that he was a governor without a province. Antigonus received Pamphylia, Lycia, and Phrygia Major; Cassander, Caria; Menander, Lydia; Leonatus, Phrygia, on the Hellespont.

In the meantime, not only Alexander's will, but even his remains, were so much neglected, that his body was allowed to lie seven days before any notice was taken of it, or any orders were given for its being embalmed. The only will he left was a short memorandum of six things which he wished to have done. 1. A fleet of one thousand stout galleys was to be built and employed against the Carthaginians and other nations who might oppose the reduction of the sea-coasts of Africa and Spain, with all the adjacent islands as far as Sicily. 2. A large and regular highway was to be constructed along the coast of Africa, as far as Ceuta and Tangier. 3. Six temples of extraordinary magnificence were to be erected, at the expense of one thousand five hundred talents each. 4. Castles, arsenals, havens, and yards for building ships, were to be established in proper places throughout his empire. 5. Several new cities were to be built in Europe and Asia; those in Asia to be inhabited by colonies from Europe, and those in Europe to be filled with Asiatics; that by blending the people and the manners of both, the hereditary antipathy which had hitherto subsisted between the inhabitants of these two continents might, if possible, be eradicated. Lastly, he had projected the building of a pyramid, equal in size and beauty to the largest in Egypt, in honour of his father Philip. But all these designs were, on the pretence of their being expensive, referred to a council of Macedonians, to be held nobody knew when or where.

The government, being now in the hands of Perdiccas

Meleager murdered, and the empire divided.

Alexander's body neglected, and his will set aside.

Macedonia. and Roxana, soon became cruel and distasteful. Alexander was scarcely dead when the queen sent for Statira and Drypetis, the two daughters of Darius, one of whom had been married to Alexander, and the other to Hephæstion; and as soon as they arrived at Babylon, she caused them both to be murdered, that no son of Alexander by any other woman, or of Hephæstion, might give any trouble to her or her son Alexander. Sisygambis, the mother of Darius, no sooner heard that Alexander the Great was dead, than she laid violent hands on herself, being apprehensive of the calamities which were about to ensue.

Revolt of the Greeks. B.C. 321. War was first declared in Greece against Antipater in the year 321 B.C.; and, through the treachery of the Thes-salians, that general was defeated, with the army he had under his own command. Leonatus was therefore sent from Asia, with a very considerable army, to his assistance; but both were overthrown with great loss by the confederates, and Leonatus himself was killed. In a short time, however, Craterus arrived in Greece with a great army, the command of which he resigned to Antipater. The army of the confederates amounted to about twenty-five thousand foot and three thousand horse; but Antipater commanded no fewer than forty thousand foot, three thousand archers, and five thousand horse. In such an unequal contest, therefore, the Greeks were defeated, and forced to sue for peace, which they did not obtain except on condition of their receiving Macedonian garrisons into several of their cities. At Athens also the democratic government was abrogated; and such a dreadful punishment did this seem to the Athenians, that twenty-two thousand of them left their country and retired into Macedonia.

Disturbances in Asia and Thrace. Whilst these things were doing in Greece, disturbances began also to arise in Asia, and in Thrace. The Greek mercenaries, who were dispersed throughout the inland provinces of Asia, despairing of ever being allowed to return home by fair means, determined to attempt it by force. For this purpose they assembled to the number of twenty thousand foot and three thousand horse; but they were all cut off to a man by the Macedonians. In Thrace, Lysimachus was attacked by one Seuthes, a prince of that country, who claimed the dominions of his ancestors, and had raised an army of twenty thousand foot and two thousand horse. But though the Macedonian commander was forced to engage this army with no more than four thousand foot and two thousand horse, yet he kept the field of battle, and could not be driven out of the country.

Ambition and cruelty of Perdiccas. Perdiccas, in the meantime, by pretending friendship to the royal family, had gained over Eumenes entirely to his interest; and at last put him in possession of the province of Cappadocia by the defeat of Ariarathes, king of that country, whom he afterwards caused to be crucified. His ambition, however, now began to involve him in difficulties. At the first division of the provinces, Perdiccas, to strengthen his own authority, had proposed to marry Nicæa, the daughter of Antipater; and so well was this proposal relished, that her brethren, Jollas and Archias, conducted her to him, in order to be present at the celebration of the nuptials. But Perdiccas had now other objects in view. He had been solicited by Olympias to marry her daughter Cleopatra, the widow of Alexander King of Epirus, and who then resided at Sardis, in Lydia. Eumenes promoted this match to the utmost of his power, because he thought it would be for the interest of the royal family; and his persuasions had such an effect on Perdiccas, that he was sent to Sardis to compliment Cleopatra, and to carry presents to her in name of her new lover. In the absence of Eumenes, however, Alcetas, the brother of Perdiccas, persuaded him to marry Nicæa; but in order to gratify his ambition, he resolved to divorce her immediately after the marriage, and to marry Cleopatra. By this last alliance he hoped to have a pretence for altering the

government of Macedonia; and, as a necessary measure preparative to these, he entered into contrivances for destroying Antigonus. Unfortunately for himself, however, he ruined all his schemes by his own jealousy and precipitate cruelty. Cynane, the daughter of Philip by his second wife, had brought her daughter Adda, who was afterwards named Eurydice, to court, in hopes that King Aridæus might marry her. Against Cynane, Perdiccas, from some political motives, conceived such a grudge, that he caused her to be murdered. This raised a commotion in the army, which frightened Perdiccas to such a degree that he now promoted the match between Aridæus and Eurydice, to prevent which he had murdered the mother of the young princess. But, in the meantime, Antigonus, knowing the designs of Perdiccas against himself, fled with his son Demetrius to Greece, there to take shelter under the protection of Antipater and Craterus, whom he informed of the ambition and cruelty of the regent.

A civil war was now kindled up. Antipater, Craterus, Neoptolemus, and Antigonus, were combined against Perdiccas; and it was the misfortune of the empire in general that Eumenes, the most able general, as well as the most virtuous of all the commanders, was on the side of Perdiccas, because he believed him to be in the interest of Alexander's family. Ptolemy in the meantime remained in quiet possession of Egypt, but without the least intention of owning any person as his superior. However, he also acceded to the league formed against Perdiccas, and thus the only person in the whole empire who consulted the interest of the royal family was Eumenes.

It was now thought proper to bury the body of Alexander, which had been kept for two years, during all which time preparations had been making for its interment. Aridæus, to whose care it was committed, set out from Babylon for Damascus, in order to carry the king's body to Egypt. This was much against the will of Perdiccas; for it seems there was a superstitious report, that wherever the body of Alexander was laid, that country should flourish most. Perdiccas, therefore, out of regard to his native soil, would have it conveyed to the royal sepulchres in Macedonia; but Aridæus, pleading the late king's express direction, was determined to carry it into Egypt, from thence to be conveyed to the temple of Jupiter Ammon. The funeral was accordingly conducted with all imaginable magnificence. Ptolemy came to meet the body as far as Syria; but, instead of burying it in the temple of Jupiter Ammon, he erected a stately temple for it in the city of Alexandria; and, by the respect which he showed for his dead master, induced many of the Macedonian veterans to join him, who were afterwards of the greatest service.

No sooner was the funeral over, than the parties above mentioned came to blows. Perdiccas marched against Ptolemy, but was slain by his own men, who, after the death of their general, submitted to his antagonist; and thus Eumenes was left alone to contend against all the other generals who had served under Alexander. In this contest, however, he would by no means have been over-matched, had his soldiers been attached to him; but as they had been accustomed to serve against those very generals against whom they were now to fight, they were upon all occasions ready to betray and desert Eumenes. However, he defeated and killed Neoptolemus and Craterus; but then found himself obliged to contend with Antipater and Antigonus. Antipater was now appointed protector of the kings, with sovereign power; and Eumenes was about the same time declared a public enemy. A new division of Alexander's empire took place. Egypt, Libya, and the parts adjacent, were given to Ptolemy, because they could not be taken from him. Syria was confirmed to Leomedon. Philoxenus received Cilicia. Mesopotamia and Arbelitus were given to Amphimachus. Babylon was bestowed on

Macedonia. Seleucus. Susiana fell to Antigenes, who commanded the Macedonian *Argyraspidæ*, or Silver Shields, because he was the first who opposed Perdikkas. Peucestas held Persia; Tlepolemus had Caramania; Python had Media as far as the Caspian Straits; Stasander had Aria and Drangia; Philip, Parthia; Stasenor, Bactria and Sogdia; Sibirtius, Aracopa; Oxyartes, the father of Roxana, Paropanisus. Another Python had the country between this province and India. Porus and Taxiles retained what Alexander had given them, refusing to part with any portion of their dominions. Cappadocia was assigned to Nicanor. Phrygia Major, Lycaonia, Pamphylia, and Lycia, were given to Antigonos; Caria to Cassander; Lydia to Clytus; and Phrygia the Less to Arideus. Cassander was appointed general of the horse; whilst the command of the household troops was given to Antigonos, with orders to prosecute the war against Eumenes. Antipater having thus settled everything as well as he could, returned to Macedonia with the two kings, to the great joy of his countrymen, having left his son Cassander as a check upon Antigonos in Asia.

Total destruction of Alexander's family.

Matters now seemed to wear a better aspect than they had yet done; and, if Eumenes had believed that his enemies really consulted the interest of Alexander's family, there is not the least doubt that the war would have been immediately terminated. He saw, however, that the design of Antigonos was altogether a selfish one, and consequently he refused to submit. From this time, therefore, the Macedonian empire in Asia ceased to exist; and the Macedonian affairs were now entirely confined to that kingdom itself, and to Greece. Antipater had not been long in Macedonia after his return, when he died; and the last act of his life completed the ruin of Alexander's family. With a view to the public good, he had appointed Polysperchon, one of the eldest of Alexander's captains, to be protector and governor of Macedonia. This failed not to disgust his son Cassander, who thought he had a natural right to these offices, and of course kindled up a new civil war in Macedonia. This was indeed highly promoted by his first actions as a governor. He began with attempting to remove all the governors appointed in Greece by Antipater, and to restore democracy wherever it had been abolished. The immediate consequence of this was, that the people refused to obey their magistrates; the governors refused to resign their places, and applied for assistance to Cassander. Polysperchon had also the imprudence to recal Olympias from Epirus, and to allow her a share in the administration, which Antipater, and even Alexander himself, had always refused her. The consequence of all this was, that Cassander invaded Greece, where he prevailed against Polysperchon. Olympias returned to Macedonia, where she cruelly murdered Arideus and his wife Eurydice. But she was herself put to death by Cassander, who afterwards caused Roxana and her son to be murdered; and Polysperchon being driven into Etolia, first raised to the crown Hercules, the son of Alexander by the daughter of Darius, and then, by the instigation of Cassander, murdered him, by which means the line of Alexander the Great became totally extinct.

Various revolutions in the government.

Cassander having thus destroyed all the royal family, assumed the regal title, as he had for sixteen years before had all the power. But he enjoyed the title of King of Macedonia only three years, after which he died, about 298 B.C. By Thessalonica, the daughter of Philip, King of Macedonia, he left three sons—Philip, Antipater, and Alexander. Philip succeeded him, but soon afterwards died of a consumption, and a contest immediately began between the two brothers, Antipater and Alexander. Antipater seized the kingdom, and, to secure himself in it, murdered his mother Thessalonica. Alexander invited Pyrrhus, King of Epirus, and Demetrius, the son of Antigonos, to assist him, and revenge the death of his mother. But Pyrrhus being bought off, and a peace concluded between the

Macedonia. brothers, Alexander, afraid of having too many protectors, formed a scheme of getting Demetrius assassinated. Instead of this, however, both he and Antipater were put to death; and Demetrius became King of Macedonia, four years after the death of Cassander.

In 287 before Christ, Demetrius was driven out by Pyrrhus, who was again driven out two years after by Lysimachus, who was soon afterwards killed by Seleucus Nicanor; and Seleucus in his turn was murdered by Ptolemy Caranus, who became King of Macedonia about 280 before our era. The new king was in a short time cut off, with his whole army, by the Gauls; and Antigonos Gonatus, the son of Demetrius Poliorcetes, became King of Macedonia in 278 B.C. He proved successful against the Gauls, but was driven out by Pyrrhus, King of Epirus, who, however, soon disoblged his subjects to such a degree that Antigonos recovered a great part of his kingdom. But in a little time, Pyrrhus being killed at the siege of Argos in Greece, Antigonos was restored to the whole of Macedonia; but scarcely was he seated on the throne, when he was driven from it by Alexander the son of Pyrrhus. The new invader was in his turn expelled by Demetrius the son of Antigonos, who, though at that time but a boy, had almost made himself master of Epirus. In this enterprise, however, he was disappointed; but by his means Antigonos was restored to his kingdom, which he governed for many years in peace. By a stratagem he made himself master of the city of Corinth, and from that time began to form schemes for the thorough conquest of Greece. The method he took to accomplish this was, to support the petty tyrants of Greece against the free states, which indeed weakened the power of the latter, but involved the whole country in so many calamities, that these transactions redounded but little to the reputation either of his arms or of his honour. He died about the year 243, leaving the kingdom to his son Demetrius II.

Neither Demetrius nor his successor, Antigonos Doson, performed anything remarkable. In 221 B.C., the kingdom fell to Philip, the last but one of the Macedonian monarchs. To him Hannibal, after the battle of Cannæ, applied for assistance, which he refused; and the same imprudence which made him refuse this assistance prompted him to embroil himself with the Romans, and at last to conclude a treaty with them, by which he in effect became their subject, being tied up from making peace or war except according to their pleasure. In 179 B.C. he was succeeded by his eldest son Perseus, under whom the war with the Romans was renewed. Even yet the Macedonians were terrible in war; and their phalanx, when properly conducted, seems to have been absolutely invincible by any method of making war at that time known. The Romans had never encountered such a terrible enemy; and in the first battle, which happened 171 B.C., they were defeated with the loss of 2200 men, whilst the Macedonians lost no more than 60. The generals of Perseus now pressed him to storm the enemy's camp; but he being naturally of a cowardly disposition, refused to comply, and thus the best opportunity he ever had was lost. Still, however, the Romans gained little or no advantage over it, until the year 168 B.C., when Paulus Æmilius, a most experienced commander, was sent to Macedonia. Perseus now put everything upon the issue of a general engagement; and Æmilius, with all his courage and military experience, would have been defeated, had the Macedonians been commanded by a general of the smallest courage or conduct. The light-armed Macedonians charged with such vigour, that, after the battle, some of their bodies were found within two furlongs of the Roman camp. When the phalanx came to charge, the points of their spears striking into the Roman shields, kept the heavy-armed troops from making any mo-

War with the Romans, B.C. 221.

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tion; whilst, on the other hand, Perseus's light-armed men did terrible execution. On this occasion, it is said that Æmilius tore his clothes, and gave up all hopes. However, the Roman general, perceiving that as the phalanx gained ground it lost its order in several places, caused his own light-armed troops to charge in those places, whereby the Macedonians were soon thrown into confusion. Perseus with his horse took to flight, and the infantry at last did the same, but not till 20,000 of them had lost their lives.

This battle decided the fate of Macedonia, which immediately submitted to the conqueror. The cowardly king took refuge in the island of Samothrace, but was at last obliged to surrender to the Roman consul, by whom he was carried to Rome, led in triumph, and afterwards most barbarously treated. Some pretenders to the throne afterwards appeared; but being unable to defend themselves against the Romans, the country was reduced to a Roman province in the year 148 B.C.

MACEDONIUS, the name of two bishops of Constantinople.

(1.) *Macedonius*, a deacon, raised to the bishopric by the Arians in A.D. 341, while the orthodox party elected the patriarch Paul. The partisans of the two rivals involved the city in a tumultuous broil, murdered Hermogenes the general whom Constantius II., during his own absence, had empowered to preserve order, and were not quelled until the emperor himself returned to the city and banished Paul. Macedonius was recognised as patriarch in A.D. 342. In that year Paul again returned, and was again banished, and Macedonius, amid much tumult and bloodshed, was forcibly installed in the see by the imperial troops. Compelled, however, by the intervention of Constans in 348 to confine his authority again to one church, and to resign the patriarchate to his former opponent, he was reinstalled in A.D. 350. He then took vengeance on his opponents by a general persecution, expelling them from all the churches in the patriarchate, banishing many, and torturing others to death. Scarcely less disastrous and bloody was the tumult that he excited among the citizens by removing the ashes of Constantine the Great from the dilapidated church of the Apostles to the church of St Acacius. In A.D. 359, on the division of the Arians into Acacians, or pure Arians, and semi-Arians, Macedonius adhered to the latter, and consequently became obnoxious to the former. His enemies, thus increased, effected his expulsion from the see in the following year at the council of Constantinople. This event, it is said, he survived only a short time.

After his deposition, Macedonius became a bold advocate of the doctrines of the semi-Arians. From this circumstance, that sect in the course of time were called *Macedonians*. Their peculiar tenet was, that the Holy Ghost is distinct from the Father and Son, and is nothing else than a divine influence pervading the entire universe. From this impugning of the Spirit, they were sometimes named *Pneumachi*. They were also called *Marathonians*, from Marathonius, one of their leaders.

(2.) *Macedonius* nominated bishop of Constantinople by Anastasius I., about A.D. 496. His subscription of the Henoticon of Zeno induced the monks of the city to renounce his communion, and to resist obstinately his attempts to reconcile them. Yet, with a mild tolerance that marked the general tenor of his conduct, he refrained from using harsh measures against them. About 511 the Emperor Anastasius withdrawing his favours from Macedonius on account of his recognition of the council of Chalcedon, deposed and banished him on a charge of heresy and other crimes. This sentence, which was condemned by the church in all parts of the empire, Vitalian the Goth, in 514, attempted by his unsuccessful rebellion to repeal. Macedonius died in exile in A.D. 516.

MACER, CAIUS LICINIUS, a Roman historian, and father

of the orator Caius Licinius Calvus, was probably born about 110 B.C. After holding the quæstorship, he was elected a tribune of the people in 73 B.C., and subsequently became prætor and governor of a province. In 66 B.C. he was arraigned by Cicero under the law *De Repetundis*, and dreading lest the verdict should be damnatory, and should involve his family in loss and disgrace, he put an end to his existence. The merits of Macer as an author can scarcely be determined by the few stray quotations from his *Annales* found in ancient authors; but he is supposed by Niebuhr to have displayed accurate and extensive research, and to have supplied abundant materials both to Livy and Dionysius.

MACERATA, a city of central Italy, capital of a cognominal delegation of the Papal States, is situate on an eminence between the rivers Potenza and Chienti, 21 miles S.W. of Ancona, and 170 from Rome. It is well built, with generally straight, spacious, and clean streets, and is surrounded by walls having six gates. In the centre of the town is a large but irregular square, in which are some of the principal buildings, including the cathedral, the palace of the delegate, and the theatre. Macerata is the see of a bishop, and the seat of a court of appeal for several of the neighbouring delegations. It has a number of churches and convents, and a university for philosophy, theology, and medicine, with a library of 20,000 volumes. It carries on some trade in corn, silk, and cattle. Under the French it was the capital of the department of Musone. Pop. 16,000. The delegation of Macerata is for the most part mountainous and wooded; but the valleys and plains are fertile and well cultivated, producing abundance of corn, wine, and fruits in great variety. Many cattle are reared. Area 861 square miles. Pop. (1850) 239,942.

MAGILLICUDDY REEKS. See KERRY.

MAGILLIVRAY, DR WILLIAM, an eminent naturalist, was born at Old Aberdeen in 1796. Amid great poverty, he was enabled to enter King's College, in his native town, and after taking the degree of A.M., he studied medicine, first at Aberdeen and afterwards at Edinburgh. His native bias, however, for natural history made him forego all intention of adopting the medical profession, and accordingly he never graduated as M.D. In 1823 he was appointed assistant to the regius professor of natural history, and regius keeper of the museum of the Edinburgh University. This appointment he resigned in 1831 for the office of conservator of the museum of the Royal College of Surgeons in Edinburgh. This work, together with translating, editing, delivering lectures, and contributing to scientific journals, was congenial to Macgillivray, since it introduced him to many naturalists, and afforded a continual facility for his favourite studies. In 1841 his scholarship, unsupported by any external influence, raised him to the chair of natural history in Marischal College, Aberdeen. There his excellence as a teacher, and his gentle and unassuming conduct, soon rendered him popular. During the whole of his life, his body, not less than his mind, had been active in the pursuit of knowledge; and it was while exploring the central region of the Grampians, in 1850, that he caught the disorder that ultimately proved fatal. After a lingering illness, during which he never ceased to work, he died in September 1852. The most popular of Dr Macgillivray's numerous works are the following:—*A History of British Birds*, in 5 vols. 8vo, 1837-1852; *A Manual of British Ornithology*, in 2 vols. 12mo, 1840-1841, reprinted in 1846; *The Flowering Plants and Ferns of Great Britain and Ireland*, 8vo, eighth edition, 1852; and a posthumous work, *The Natural History of Deeside and Bruemar*, 1856, the copyright of which was bought by Prince Albert. He also contributed largely to the *Transactions of the Wernerian Natural History Society*, to the *Edinburgh Philosophical Journal*, to the *Edin-*

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Machiavelli.

MACHIAVELLI, NICOLÒ, for many years secretary of the republic of Florence, and justly celebrated for his political, historical, and other writings, was born at Florence on the 3d of May 1469, being descended from a family which traced its origin up to the ancient marquises of Tuscany, particularly to the Marquis Hugo, who lived about the middle of the ninth century. The Machiavellis were signors or lords of Monte-Spertoli; but preferring the right of citizenship in Florence to the useless conservation of privileges which were daily becoming more and more obnoxious to the rising commonwealth, they prudently submitted to its laws in order to accept employment in the highest offices of the magistracy. This family was one of those attached to the Guelfic party which abandoned Florence in the year 1260, after the defeat at Monte-Aperti. But their secession was merely temporary. Having returned to their native country, they regained their influence, and occupied some of the first offices of the state; no less than thirteen of their number having held the situation of gonfaloniere of justice, and fifty-three that of prior, dignities which were then considered as the most important in the republic. The father of Machiavelli was a jurisconsult, and lived in a state but little removed from poverty. His mother, who appears to have been a woman of talent, loved poetry, and composed verses with facility. It is believed that, about the year 1494, he was placed under the tuition of the learned Marcello di Virgilio, professor of Greek and Latin literature, and the translator of Dioscorides. How long he remained under the care of this master, or what advantages he derived from his instructions, has not been ascertained. But, five years later, when he had scarcely completed his twenty-ninth year, he was preferred, amongst four competitors, to the employment of chancellor of the second chancery of the Signory; a few months afterwards, he was appointed, by the Signory and the colleges, secretary to the ten magistrates of liberty and peace, which constituted the general government of the republic; and with this employment he continued invested for about fourteen years and a half. His ordinary occupations, when he resided at Florence, comprehended the political correspondence, both internal and external, the recording of the deliberations of the council of magistrates, and the redaction of treaties with foreign states.

But the Florentine government, justly appreciating the talents of Machiavelli, were not long in extending his functions; and he was in consequence successively intrusted with no less than twenty-three foreign legations, besides frequent commissions to the cities dependent on the republic. The first mission on which he was despatched was to France, where he arrived in 1500, soon after the raising of the siege of Pisa. Louis XII. had furnished to the Florentines troops and artillery to form the siege of that place; and the republic had sent to the camp two commissioners, besides its secretary Machiavelli, who carried on the correspondence. The Pisans, however, negotiated with the king, and at the same time gained over the principal officers in the besieging army. The French troops were to be paid by the Florentines, but some delay having occurred in forwarding their pay, they availed themselves of this as a pretext, and having disbanded, the siege was in consequence raised. The French king reproached the Florentines for the disgrace which had thus been brought on his arms; and it was to appease him, and if possible to obtain fresh succours, that they sent to France Machiavelli, and Francisco della Casa, who had been

one of the commissioners in the camp before Pisa. During this negotiation, which lasted five months, the deputies followed the court to Saint-Pierre-le-Moutier, Montargis, Melun, Blois, Nantes, and Tours. They had several audiences of the king, and his minister Cardinal d'Amboise; but these led to no satisfactory result. The envoys were continually met with the same reproaches, and the court was only appeased by the reimbursement of the sums which the king had advanced to the troops.¹

In the year 1502 Machiavelli was sent to the Duke di Valentino (Cesare Borgia) at Imola, and next to Rome. He also went a second time to France, and afterwards to Siena, to Piombino, and to Perugia. In 1507 he proceeded by Geneva to Constance, and from thence to Bolzano, at that time the residence of the Emperor Maximilian, with whom he treated of important affairs. The relation of this mission is printed amongst his complete works, under the title of *Rapporto di cose della Magna, fatto questo dì 17 giugno 1508*. In 1510 he re-appeared in France, and, after passing about two months at Blois, witnessed the opening of the national council at Tours. A fourth mission to the court of Louis XII. is commonly referred to the following year, 1511; but it appears uncertain whether it was actually undertaken. It may with truth be said, however, that if Machiavelli failed to secure the complete independence of his country, this proceeded from no fault of his own; inasmuch as the accomplishment of such an object would have required more confidence on the part of his fellow-citizens, greater harmony between the different opinions which then divided the city, and times less turbulent and unpropitious. But the glory cannot be denied him of having attempted this noble enterprise, and devoted to its accomplishment all his genius, and all the influence which he was permitted to exercise in the conduct of public affairs.

This is fully established by his political correspondence, which, besides, is in the highest degree valuable and interesting. His despatches, indeed, form one of the most amusing and instructive collections extant. In them we meet with none of that mystical and verbose jargon which is so common in modern state-papers. The narratives are clearly and agreeably written, and the remarks on men and things are equally shrewd and judicious. We are introduced into the presence of men who, during twenty years, swayed the destinies of Europe. Their wit and their folly, their gloom and their gaiety, are alike exposed to us; we are admitted to overhear their familiar talk, to see the masters of the world in undress, and to observe the manifestations of their real characters. It is interesting and curious to recognise, in circumstances which commonly elude the notice of historians, the feeble violence and the shallow cunning of Louis XII.; the bustling insignificance of Maximilian, a prince afflicted with an impotent desire of renown, rash yet timid, obstinate yet fickle, always in a hurry, yet always too late; the fierce and haughty energy which gave dignity to the eccentricities of the magnificent Julius; and the soft, smooth, calm, graceful manners which masked the insatiable ambition and deadly hatred of Cesare Borgia. The meeting of the Florentine secretary and the Duke di Valentino, of the greatest speculative and the ablest practical statesman of the age, is a memorable occurrence in the history of both. Upon two important occasions Machiavelli was admitted to the society of Borgia; once, at the moment when his splendid villany had achieved its most signal triumph, when he caught in one snare, and crushed at one blow, all his most formidable rivals;² and again when, exhausted by disease, and overwhelmed by misfortunes, he

¹ Ginguené, *Histoire Littéraire d'Italie*, tom. viii.

² See in *Opere di Machiavelli* (vol. ii. Hague, 1726), *Descrizione del modo tenuto dal Duca Valentino nello ammazzare Vitellozzo Visconti, Oliverotto da Fermo, il Signor Pagolo, et il Duca di Gravina Orsini*.

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was the prisoner of the deadliest enemy of his house. These interviews are fully described in the correspondence. Several writers have supposed that there existed a close and intimate connexion between these remarkable men, and the secretary-envoy has even been accused of prompting the crimes of this artful and merciless tyrant; but, from the official documents, it is evident that their intercourse, though ostensibly of an amicable, was in reality of a hostile description. "It cannot be doubted, however," says an able writer, "that the imagination of Machiavelli was strongly impressed, and his speculations on government coloured, by the observations which he made on the singular character, and equally singular fortunes, of a man who, under such disadvantages, had achieved such exploits; who, when sensuality, varied through innumerable forms, could no longer stimulate his sated mind, found a more powerful and durable excitement in the intense thirst of empire and revenge; who emerged from the sloth and luxury of the Roman purple the first prince and general of the age; who, after acquiring sovereignty by destroying his enemies, acquired popularity by destroying his tools; who had begun to employ for the most salutary ends the power which he had attained by the most atrocious means; who tolerated within the sphere of his iron despotism no plunderer or oppressor but himself; and who fell at last, amidst the mingled curses and regrets of a people, of whom his genius had been the wonder, and might have been the salvation."¹ Some of the crimes of Borgia, which appear to us the most revolting, would not have been viewed with equal horror by an Italian of the fifteenth century; and, besides, patriotic feeling might induce Machiavelli to regard with indulgence and regret the memory of the only leader capable of defending the independence of Italy against the confederate spoilers who were then plotting the dismemberment of that divided and unhappy country.

But whilst Machiavelli deeply regretted the misfortunes of his country, he clearly discerned the cause and the remedy of these. It was the military system of the Italian people which had extinguished their valour and discipline, destroyed their independence, and rendered their wealth an easy prey to every foreign plunderer. Machiavelli projected a scheme for abolishing the practice of employing mercenary troops, and organizing a national militia; and the exertions which he made to accomplish this grand object are alike honourable to his understanding and his patriotism. He studied with assiduity the art of war, and made himself master of all its details.² When levies were decreed, he flew from place to place to superintend the execution of his design, and availed himself of every circumstance which could contribute to its success. For a time the scheme promised well, and the new troops acquitted themselves respectably. But the fury of parties continued to increase, and the tide of misfortune came on before the barriers which should have withstood it were prepared. The emperor and the pope wished to re-establish the Medici, and the moment was favourable for such an enterprise. Florence was then governed by the gonfaloniere Soderini, a man equally presumptuous and feeble, who obstinately adhered to France, without discerning that that power was not in a condition to afford him any aid. It was in reference to this inconsiderate policy that Machiavelli observed, "The good fortune of France has made us lose half the state; her bad fortune will cause the loss of our liberty."³ The prediction was not long in being verified. As soon as the French armies had lost their superiority in Italy, the storm burst upon Florence. In 1512, the pope and the

emperor combined against their common enemy, and, contrary to the faith of treaties, imposed a contribution of a hundred thousand florins. Machiavelli flew through the territory of the republic, to examine the state of the fortresses, and organize a vigorous resistance; but all his efforts were unavailing, and divided Florence soon opened its gates to the Medici, who re-conquered at once their property and their ancient authority.

This revolution, which caused the ruin of the gonfaloniere, proved also the signal for the fall of the secretary. The new Signory immediately attacked him in two decrees, dated the 8th and 10th of November 1514. By the one he was deprived, "absolutely despoiled," of his offices of chancellor and secretary to the ten magistrates of liberty and peace; by the other he was exiled for a year to a part of the Florentine territory, which he was forbidden to quit under the penalty of incurring the displeasure of the Signory. A third decree, dated the 17th of the same month, prohibited him from entering the palace of the high and magnificent signors. On this subject Ginguené has omitted some facts. "Machiavelli," says he, "after fourteen years of service useful to his country, was first deprived of his employment, and then confined for a year to the territory of the republic, with a prohibition not to set foot in the palace of the Signory. Nor was this the term, it was in fact only the commencement of his misfortunes." And he adds in a note, that the fate of the secretary was decided by three decrees of the 8th, 10th, and 17th of November. There appears to be some confusion in this statement. The decree of the 17th was evidently a mitigation of that of the 10th. The latter banished him for a year, and intimated to him that he was not to leave the territory of the republic; that is, it ordained him to quit Florence in order to live in the Florentine dominions, exclusive of the city properly so called. The third decree, dated the 17th, only prohibited him from entering the palace of the Signory, without ordaining him to leave the city; but another decree of the same date was published, in which he was permitted to enter the palace during the whole of the day of the 17th; and the same liberty was granted him on the 4th of December 1512, and on the 21st of March and 9th of July 1513. Ginguené has refuted some of the statements published respecting the treatment Machiavelli is alleged to have experienced after the return of the Medici; but it is not the less true, as appears by the subsequent modifications of the original decree, to the extent already stated, that the removal of the secretary was considered as an affair of some difficulty, and one the accomplishment of which required management and address. But when this object had been effected, he found himself exposed to the greatest dangers. Accused of being concerned in the conspiracy formed by Capponi and Boscoli against Cardinal de' Medici, afterwards Leo X., he was thrown into prison, and put to the torture, which he endured with unflinching resolution. "I have been near losing my life," said he, "which God and my own innocence have saved; I have supported all evils, including imprisonment and others." On the accession of Leo X. he was included in an amnesty, and owed his deliverance to the generosity of that liberal and accomplished pontiff.

These terrible trials, which extraordinary courage can alone withstand, attest the energy and the force of character which belonged to the fallen statesman. Instead of yielding to despondency, he sought for an alleviation of his lot in study and in literature; and it is to his misfortunes that we are indebted for the best known of his works, the

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¹ *Edinburgh Review*, vol. xlv. pp. 283, 284.

² See his treatise *Dell' Arte della Guerra*, passim.

³ Speaking, on one occasion, of the alliance with France, he observed, *che la buona fortuna di essa aveva fatto perder la metà dello stato, la cattiva avrebbe fatto perdere la libertà.*

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Prince, the dialogue on the *Art of War*, his *Histories*, and *Comedies*, which he composed during his retirement at San Casciano, and which, with the collection of his political letters, deserve to be classed amongst the most remarkable monuments of modern literature. From his retreat, however, he wrote to the friends whom he had still preserved, signifying his desire to be again employed in the conduct of affairs; and his wishes in this respect were to a certain extent gratified. After the death of Lorenzo de' Medici, Leo X. who possessed great influence in the government of Florence, recalled Machiavelli, and requested him to point out the means of reforming the administration. In 1521, there was confided to him a mission to the minor brothers at Carpi. He was next ordered to fortify anew the city, and to treat of some affairs with Francisco Guicciardini, then governor of Romagna. Finally, he was employed in the army of the league against Charles V. This commission was the last remarkable occupation of his life. He returned to Florence in one of the last days of May 1527, and having, not long afterwards, suffered much inconvenience from pains in the stomach, he took a medicine in which he had great faith for relieving this disorder; but being soon attacked by violent spasms in the bowels, he expired on the 22d of June, at the age of fifty-eight, after having received all the sacraments of the church. The following letter from his son Pietro to Francisco Nelli, professor at Pisa, annihilates all the fables which have been circulated respecting his death:—"I cannot tell you without tears, that, on the 22d of this month, our father Nicolo died of pains in the bowels, caused by a medicine which he had taken two days before. He was made to confess his sins by the friar Matteo, who kept him company till his death. Our father has left us in great poverty, as you know." Machiavelli was in his person of the ordinary size, his complexion was of an olive hue, and his physiognomy animated and expressive; in conversation he was at once simple and lively, and his repartee was prompt and piquant. Conversing one day with Clodio Tolomeo, the latter said to him, "At Florence the men have less science, and are less learned, than at Siena, always excepting yourself;" to which Machiavelli replied, "At Siena the men are greater fools than at Florence, not even excepting you." Some one having remarked to him that he had taught princes to be tyrants, he replied, "If I have taught princes to be tyrants, I have also taught the people to destroy tyrants." He was interred in the church of Santa-Croce, in the burying-place of his family; but for more than two centuries his bones lay undistinguished, and it was reserved for an English nobleman, Earl Cowper, to pay the last honours to the greatest statesman of Florence, by erecting a monument to his memory.¹

Several writings of the Florentine secretary are regarded as estimable productions of a superior mind; others are considered as pernicious, and containing abominable doctrines. Amongst the latter are the apology for the conduct of the Duke di Valentino, when he caused Vitellozzo-Vitelli and others to be massacred at Sinigaglia (*Il modo tenuto dal Duca Valentino, &c.*); the treatise of the Prince (*Il Principe*); and some detached opinions contained in the Discourses on Titus Livius (*Discorsi sopra la prima deca di T. Livio*), which opinions, forming part of a writing pos-

terior to the composition of the *Principe*, will, as far as possible, be explained in the more detailed exposition which we shall endeavour to give of the object and intentions of the author when he composed that celebrated treatise.

At the head of the works generally admitted to have established beyond all dispute the reputation of Machiavelli as a profound thinker, and a politician of inexhaustible genius, may be placed those letters or despatches, published under the title of *Legazioni*, of which we have already spoken incidentally. Ginguené has observed, in reference to these letters, that one would not willingly read the collection, which he considers somewhat diffuse, but that, in regard to the character and life of the secretary, and the history of his own time, it may be consulted with advantage. In this opinion, however, we cannot by any means concur. The collection is suited to the taste of the age, and the country to which it belongs; nor has this taste materially changed; for even the Italian diplomatists of the present day frequently indulge in similar details, introducing such arguments as they think fitted to support their observations, and to create a favourable impression of their zeal and industry. That the *Legazioni* sometimes descended into minutiae which may be considered as trifling or irrelevant, we readily admit; but even these particulars are by no means devoid of interest; and as to the entire collection, a reader of intelligence cannot peruse it without being at once amused and instructed by it.

The seven books on the Art of War (*Dell' Arte della Guerra*) show that Machiavelli was profoundly conversant with the principles of military science. An Italian writer, advertent to this circumstance, observes, that such knowledge is not only wonderful in a man devoted to civil occupations, but might even be considered as extraordinary in an old general. According to the author of the preface to the edition of 1813, Machiavelli had acquired this insight into military science in consequence of profound meditations on the works of the ancient Romans, who may be regarded as the first masters of the art of war; and, in fact, the combinations of the secretary have constant reference to those of Vegetius. His principal object was to establish the superiority of infantry, at a time when this branch of the service had fallen into general discredit; and his theories fortunately attracted so much regard, that to him may, in a great measure, be attributed the return of sound tactics, and the perfection to which the art of war subsequently attained. Algarotti, in his fourth discourse on the studies of Palladio, gives us to understand that that celebrated architect learned the military art in the writings of the Florentine secretary; Frederick II. has described, in agreeable verses, some of his military precepts; and there is a French work, entitled *Instructions sur le fait de la Guerre, extraites des livres de Polybe, Frontin, Végèce, Machiavelli, et plusieurs autres bons auteurs*, Paris, 1563. Of the tactics of Machiavelli it is not necessary to express here any opinion. But the treatise is able and interesting; as a commentary on the history of the times it is invaluable; whilst the ingenuity, grace, and perspicuity of the style, and the eloquence and animation of particular passages, must give pleasure even to readers who take no interest in the subject which the author treats with so much skill and ability.²

The *Discorsi*, written about the year 1516, the epoch of

¹ This monument, which is the work of Spinazzi, bears the inscription, *Tanto nomini nullum par elogium, Nicolaus Machiavelli obiit* A. P. V. MDXXVII.

² The treatise on the Art of War is in the form of a dialogue, and the opinions of the writer are put into the mouth of Fabrizio Colonna, a nobleman of the ecclesiastical state, and an officer of distinguished merit in the service of the king of Spain. After some preliminary conversation, Fabrizio expresses his regret that those who in later times affected the manners of the old Romans, should select for imitation their most trifling pursuits. This leads to a discourse on the decline of military discipline, and the best means of restoring it. The institution of the Florentine militia, to which we have already alluded, is very ably defended; and several improvements are suggested in the details.

The Swiss and the Spaniards were at this time regarded as the best soldiers in Europe. The Swiss battalion consisted of pikemen in deep formation, and bore a close resemblance to the Grecian phalanx. The Spaniards, like the soldiers of Rome, were armed

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his disgrace, prove that the principles of the author were uniform and constant, and that his views and observations had always a character of justness, depth, and gravity. The Roman republic, in its constitution and its establishments, contained the germs of its greatness; and the inroads committed upon these were the causes of its decline. Machiavelli followed this fatal progress beyond the history of Livy; he discerned and meditated on it in the *Annals* and in the *History* of Tacitus. He there found not only facts, but results; a manner and a style, which he adopted as models. Tacitus became his master in the art of observing, and also, in one sense, in the art of writing; what he had acquired in the study of the former of these two great historians he carried to the school of the latter; and it may be said that he learned from Tacitus to read and explain Livy. After having laid the foundations of his work on the history of Rome, Machiavelli employed himself in following Livy step by step in the perusal of that history; stopping short at every thing which suggested a reflection, or indicated the application of a principle. The text of the historian disappears, or is but rarely cited; actions, institutions, and laws, are alone discussed. The objects of comparison, ancient as well as modern, spring up, so to speak, every instant; luminous results are thence deduced; and an inexhaustible variety of facts continually supports the evidence of the reasonings and the solidity of the maxims. Throughout we discover a mind habituated to profound meditations, and a firmness of soul tried and exercised by the storms of liberty. See, for example, to what he reduces, in his fourth chapter, all the noise made by the quarrels between the senate and the Roman people, which he does not hesitate to regard as the primary cause of the liberty of Rome. Observe also, in his seventh chapter, the strong reasons upon which he grounds the utility, or rather the necessity, of public accusations; and with what justness of discrimination he distinguishes, in his eighth chapter, the effect of public accusations, preferred on public grounds, from those of adulation and calumny. In a word, he reasons inductively from history as he finds it, and deduces his conclusions, not from any appeal to general or speculative principles, but from the facts as these are detailed in the pages of the historian. If he errs, it is only because his experience, acquired in a peculiar state of society, does not always enable him to calculate the effect of institutions differing from those of which he had observed the operation; but in regard to all that comes within the sphere of his own observation or experience, his sagacity is seldom at fault, and he may justly be considered as the founder of that science which has been somewhat vaguely denominated the philosophy of history.

The books *Delle Historie Fiorentine*, a work in which he begins by describing the events which brought about the destruction of the Roman empire, are altogether an admirable composition, and entitle Machiavelli to a sepa-

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rate place amongst historians, seeing that the ancients have not left any model on which he could form a particular style. The first book displays the science and penetration of the writer; and it may be supposed that Bossuet was filled with admiration of his free, bold, rapid, and independent manner, when he sketched the plan of his *Discourse on Universal History*. The narrative in the seven other books proceeds with the same vivacity; nor can the most careless reader fail to receive from it a vivid and faithful impression of the national character and manners of the Florentines. This work was undoubtedly the last of the author. He is believed to have completed it in 1525; and it was his intention, we are told, to continue it, which is rendered probable by the fragments collected after his decease. The general character of Machiavelli's style, particularly in the *History* and in the *Life of Castruccio*, is elegance and simplicity. He is always full of grace without artifice, and of elegance without insipidity; he is clear without being verbose, and concise without obscurity or pretension to the mysterious; and such is the transparency of the medium through which his ideas are conveyed, that the actual depth of the current of thought is not at first discernible.

Although the real merit of the Florentine secretary consists in his profound knowledge of the science of government, in which he has not been surpassed either amongst the ancients or the moderns, yet he is also entitled to a distinguished place amongst comic authors. His *Mandragola*, which, according to Voltaire, surpasses all the comedies of Aristophanes, is superior to the best of Goldoni, and inferior only to the best of Molière; in fact, it is the work of a man who, if he had devoted himself to the drama, would probably have attained the very highest excellence, and produced a permanent and salutary impression upon the national taste. By the correct and vigorous delineation of human character, it produces interest without a skilful or pleasing plot, and laughter without the least ambition or affectation. Machiavelli had an exquisite sense of the ridiculous, and his dramatic humour, which has often been compared to that of Molière, and certainly resembles it in comic force, if not in benevolent gaiety and chastened morality, seldom fails to prove effective. The *Clizia* is an imitation of the *Casina* of Plautus, which is itself an imitation of the lost *Καμπανιον* of Diphilus. Machiavelli has executed his task with judgment and taste, accommodating the plot to a different state of society, and dexterously connecting with it the history of his own times. Besides these, the *Maschere*, the *Andria*, and two other comedies without titles, the one in prose and the other in verse, appear amongst the works of Machiavelli. The charming little novel of *Belphegor* is also pleasantly conceived and wittily told; but the extravagance of the satire in some measure injures its effect. Machiavelli was unhappily married; and his wish to avenge his own cause as well a

with the sword and the shield. But the victories gained by Flaminius and Æmilius over the Macedonian kings seemed to prove that the weapons used by the legions were superior to those of the phalanx. And the same experiment had been recently tried with the same result at the battle of Ravenna, "one of those tremendous days into which human folly and wickedness compress the whole devastation of a famine or a plague." In that dreadful conflict, the infantry of Aragon, deserted by their allies, hewed a passage through the thickest of the imperial pikes, and effected an unbroken retreat, in the face of the gensdarmie of De Foix, and the artillery of Este. Machiavelli, struck with these facts, proposes to combine both systems; to arm the foremost lines with the pike, for the purpose of repulsing cavalry, and those in the rear with the sword, as being a handy weapon, adapted to almost every exigency. He expresses the highest admiration of the military science of the ancient Romans, and the greatest contempt for the maxims in vogue amongst the Italian commanders of the preceding generation; he prefers infantry to cavalry, and fortified camps to fortified towns; he recommends the substitution of rapid movements and decisive engagements for the languid and dilatory operations of his countrymen; and he attaches but little importance to the invention of gunpowder, which, he seems to think, ought scarcely to produce any change in the mode of arming or disposing troops. The artillery of those days was ill constructed, ill served, and consequently of little use in the field of battle; this arm was then in a rude, inefficient state, and hence might in a great measure be disregarded in a general system of tactics; but if Machiavelli could have foreseen the improvements which were destined to take place, particularly in point of mobility, he would have been convinced that a change both in the mode of arming and disposing troops would in consequence become necessary, and that the deep formations of ancient times durst no longer be opposed to the ravages of shot, shells, grape, canister, and the other destructive missiles discharged by modern artillery.

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that of his brethren in misfortune carried him beyond even the license of fiction.¹

Machiavelli was also a poet, though, in this capacity, he is not perhaps entitled to a very high place. The *Decennali* are merely abstracts in verse of the history of his own times. The style and versification are sedulously modelled on those of Dante; but the manner of Dante, like that of every other great original poet, was suited only to his own genius and his own subject, and did not therefore admit of being copied or imitated. The *Assino d'Oro* and the *Capitoli* are also formed on the same model, and are in every respect superior. The Golden Ass indeed has nothing but the name in common with the romance of Apuleius, which, in spite of its irregular plan and vicious style, is one of the most fascinating books in the Latin language, combining the various merits of Le Sage and Radcliffe, Bunyan and Cr  billon. The poem of Machiavelli, which is evidently unfinished, is copied from the earlier cantos of the *Inferno*; whole lines are transferred without acknowledgment, and all without producing their wonted effect; the flowers of language which have bloomed upon one soil, wither when transplanted to another. Yet the *Assino d'Oro* is not altogether destitute of merit; the allegory displays considerable ingenuity, and there is some vivid colouring in the descriptions.

But, of all the works of Machiavelli, that which has excited the greatest attention is the celebrated treatise entitled *Il Principe*. This production, in which the ferocious Borgia is, according to the supposition of several writers, presented as a model to sovereigns who wish to govern absolutely, has acquired a deplorable reputation in Europe, and made the author himself be regarded by many as an incarnation of the evil principle.² The first edition, known as that of Antonio Blado d'Asola, appeared at Rome on the 4th of January 1532, accompanied with a privilege of Pope Clement VII. and dedicated to Philip Strozzi, the friend of the author. Bayle speaks of an edition of 1515, which no one has seen, there being, in all probability, a misprint in the date. The Giunta reprinted the *Prince* the same year, 1532, and again in 1540. The sons of Aldus also published it at Venice in 1540; and Gabriel Giolito gave an edition of it in 1550. It was successively translated into German, Mont  liard, 1626; twice into Latin; then into French by Amelot de la Houssaye (Amsterdam, 1683, and Hague 1743), and, lastly, by Giraudet in 1799, along with the complete works of the author.

We know not of any work which has excited so much discussion and controversy as this, or which has been so often and so vehemently assailed. The intentions of the author have been variously interpreted. Some, thinking they saw in it a complete system of irreligion, impiety, and tyranny, have cried out "Wolf, wolf;"³ whilst others have demanded that, according to the rules of just criticism, the work should be judged of as a whole, not by detached or disfigured fragments, and that, above all, the disapprobation with which the author always accompanies the exposition of the perverse principles he has developed, should not be dissembled or concealed. Voltaire, writing to the prince-royal of Prussia (20th May 1738), observes: "The first thing I am obliged to advert to is the manner in which you think of Machiavel. Why should you be moved with the virtuous displeasure

which you express against me because I have praised the style of a bad man? It is for the Borgias, father and son, and all those petty princes who require crimes to effect their elevation, to study this infernal policy. It belongs to such a prince as you to detest it. This art, which may be classed with that of the Locustes and the Brinvilliers, may give to some tyrants a temporary sway, just as poison may procure an inheritance; but most assuredly it has never made men either great or happy. What, then, can any one accomplish by pursuing this frightful policy? Nothing but misery to others, and also to himself. These are the truths which should form the catechism of your exalted soul." On the 26th of June 1739, the prince replies to this flattering homage in the true French style, by informing his correspondent that what he meditates against Machiavelism is properly a continuation of the *Henriade*. "It is out of the noble sentiments of Henri IV." says he, "that I am forging the thunderbolt which will crush Cesare Borgia." On the 27th of December, Voltaire renders homage for homage. "We shall at length," says he, "have a book worthy of a prince; and I doubt not that an edition of Machiavel, with this counter-poison at the end of each chapter, will be one of the most precious monuments of literature." "The *Anti-Machiavel*," he adds, "ought to become the catechism of kings, and of their ministers." The book which, in this commerce of flattery, Voltaire denominates *Anti-Machiavel*, is the *Examen du Prince de Machiavel*, by the prince-royal, afterwards king of Prussia, who, in his preface, declares that "he always looked upon the *Prince* as one of the most dangerous works that ever was published," though he afterwards lived long enough to find some of its maxims more convenient and agreeable than he had at first anticipated.

It would be equally endless and impertinent to relate the host of criticisms and apologies, of accusations and defences, of which Machiavelli has been the object, in almost all the languages of Europe. But we shall cite the authority of a judge whom it will not be easy to refute; we mean that of the Florentine secretary himself. Before finishing his treatise of the *Prince*, he wrote to one of his friends, Francisco Vettori, a letter, which discloses without any reserve his real position and his motives, and thus puts an end to all speculation upon the subject. This letter, found in the Barberini library at Rome, was published for the first time by Angelo Ridolfi, in a work entitled *Pensieri intorno allo scopo di Nicolo Machiavello nel libro Il Principe*, Milan, 1810; and Ginguen   has also cited it in his *Histoire Litt  raire d'Italie*, though, for some reason, he has divided it into two parts, giving the one half in the text, and the other half in a note. The first part contains details which may perhaps be considered as ignoble, but which nevertheless make known the peculiar cast of character, as well as the patience, of the author; the second shows him in all the dignity of his talent. We shall only cite the portion which has immediate reference to the subject before us.

"On the approach of evening," says he, continuing the description of his habits and mode of life, "I retire to my dwelling, and enter my cabinet; at the door I divest myself of my peasant's garb, bedaubed with mud and dirt, put on proper attire, and thus decently dressed I enter the ancient courts of men of old. Being well received by them, I fill myself with that nourishment which alone agrees with

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¹ The subject of this *novella piacevolissima* cannot be better described than in the words of the argument prefixed: "Befagor arcidivolo    mandato da Plutone in questo mondo, con obbligo di dover prender moglie. Ci viene, la prende; e non potendo soffrire la superbia di lei, ama meglio ritornarsi in Inferno. che ricongiungersi seco." Ben Jonson, in the plot of *The Devil is an Ass*, appears to have taken some hints from this tale, with others from Boccaccio.

² "Out of his surname," says a writer in the *Edinburgh Review* (vol. xlv. p. 260), "they coined an epithet for a knave, and out of his Christian name a synonyme for the devil." For the latter point, the writer has the authority of Hudibras (part iii. canto l.).

Nick Machiavel had ne'er a trick,
Though he gave his name to our Old Nick.

But on this subject the antiquarians, we believe, are by no means agreed.

³ See preface to the French edition of 1813.

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velli.

me, and for which I was born; nor do I hesitate to converse with them, and to inquire the motives of their actions; whilst they, on the other hand, being full of humanity, reply to my inquiries. For four hours I experience no weariness; I forget all sorrow; I have no dread of poverty, and death no longer alarms me; I transport myself entirely to them; and, as Dante says that *there will never be science unless we retain what we have learned*, I have noted down the substance of my conversation with them, and composed a work, *De Principatibus*, in which I enter as deeply as I can into this subject, with a view to fathom it. I examine what a principality is; how many kinds there are of them; how they are acquired, how maintained, how lost; and if ever any trifle (*ghiribizzo*) of mine gave you pleasure, this should not displease you. It should also be acceptable to a prince, more especially to a new one; wherefore I address it to the magnificent Julius.¹ Philip Casavecchia has seen my treatise, and can inform you in detail of the subject itself, and the arguments I have had with him; and as to myself, I am now occupied in extending and correcting it. You wish that I should abandon my actual mode of life, and go to enjoy yours; I will do so gladly; but I am prevented at present by some affairs which will be settled in about six weeks. The only thing which makes me hesitate is, that, near these Soderini, I shall be obliged, on my arrival, to visit and to speak with them. I am also apprehensive that, upon my return, instead of stopping at my own house, they would make me alight at the barigel (prison); for although this state stands on solid foundations, and enjoys great security, still it is new, and consequently suspicious; nor are there wanting meddling intriguers (*saccenti*), who, like Paul Bertini, would run up a long score, and leave me to pay the reckoning. I beseech you to save me from this danger, and I will by all means come to you at the time I have mentioned. I have been talking with Philip about my little work (the *Prince*), and I have asked him whether it would be proper to give it to the world or not, and, in the event of its being expedient to do so, whether I should bring it myself or send it to you. Were it not published, it is doubtful whether it would ever be read by Julius, and Ardinghelli² would reap the honour of this the last of my works. *The necessity which pursues me, however, urges me to give it, because I am wasting away, and cannot long remain thus without becoming contemptible through poverty. My wish is, that these Medici would begin to employ me, were it only at first to roll a stone.* If I did not then gain their good will, I would have myself only to blame; and by this production, if it be read, people will see that, during the fifteen years I passed in studying the art of government, I have not been a careless or inattentive observer; besides, every one should be eager to employ a man who has acquired experience at the expense of others. Of my fidelity no doubt can reasonably be entertained, because, having always acted with good faith, I am not likely now to sacrifice my character. He who has been faithful and good forty-three years, which is my present age, cannot change his nature. *My indigence sufficiently attests my fidelity and uprightness.*"

This letter requires no explanation or commentary. In it Machiavelli lays bare his whole soul, disclosing without reserve his vexation, his dread of misery, the shame with which he regarded the almost disgusting situation to which

he had been reduced, and his desire at any sacrifice to be again employed in public affairs; nor will the attentive observer, who reads it with care, fail to discover in it a key to the treatise of the *Prince*. Indeed the Italian writers no longer judge of that work without referring to the letter addressed to Vettori.³ It has been said that Machiavelli, despairing of the liberty of Florence, was inclined to support any government which might secure its independence. But this is a refinement wholly unsupported by evidence. The motive which impelled him to the composition of the work was actual indigence, and the prospect of still greater misery; the object which he sought to attain by it was immediate employment under the new masters of Florence, were it only in the first instance to roll a stone. None of the designs which have been so freely imagined, and so confidently ascribed to the fallen secretary, seems ever to have entered his mind. He wanted bread, and thinking that his book, containing the results of his experience and observation, would be acceptable to a prince, especially a new one, he tenders it through Vettori, in the hope that it might be instrumental in saving him from that destitution, the prospect of which he contemplated with so much horror. It is also to be observed that the book, when first published, did not appear to the Italians in the light in which it was afterwards regarded. This is sufficiently evident from the fact that it was printed in virtue of a privilege granted by Pope Clement VII., dated the 23d of August 1531. Italy was then abandoned to such disorders, that some sovereigns hoped to find useful counsels, where, in point of sound morality, they could meet with nothing but odious precepts. At the same time, if we separate the author from his work, it may be observed, that Machiavelli could not know that his work would ever be published. He composed it in the form of a memoir to Lorenzo de Medici; and in his dedication to that young prince, he tells him that he has nothing to offer him but the knowledge of the actions of great men, which he had acquired by long experience in modern affairs; and at the close he adds, "If your magnificence, from the elevated station you occupy, would deign to cast an eye on this lower region, you would learn how unjustly I suffer under the great and continual malignity of fortune."⁴

With regard to the general character of Machiavelli as a writer, and also to the particular question, whether the treatise of the *Prince* was a serious production, or, as Bacon seems to suggest,⁵ merely a piece of grave irony, intended to put nations on their guard against the arts of new and ambitious princes, we refer the reader to the judicious and discriminating remarks upon both points, contained in the First Preliminary Dissertation (pp. 32-37). The *Prince* is an account of the means by which tyrannical power is to be acquired and preserved; it is a theory of that class of phenomena in the history of mankind. Hence it is essential to its purpose that it should contain an enumeration and exposition of tyrannical arts; and on this account it may not only be viewed, but used, as a manual of such arts. A philosophical treatise on poisons would, in like manner, determine the quantity of each poisonous substance capable of producing death, the circumstances favourable or adverse to its operation, and every other information essential to the purpose of the poisoner, though not intended for his use. But the general utility of such a work is,

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¹ In point of fact, it is dedicated to the young Lorenzo de' Medici, duke of Urbino, and brother-in-law of Strozzi.

² Nicolas Ardinghelli, distinguished for his acquirements in Greek and Roman literature, died a cardinal at Rome in 1547.

³ On this question, and on other important points relative to Machiavelli, the reader may consult the excellent dissertation of the Chevalier Baldelli.

⁴ Et se vostra Magnificenza dallo apice della sua Altezza, qualche volta volgerà gli occhi in questi luoghi bassi, conoscerà quanto indegnamente io sopporti una grande e continua malignità di fortuna."

⁵ "Est quod gratias agamus Machiavello et hujusmodi scriptoribus, qui aperte et indissimulanter proferant quid homines facere soleant, non quid debeant." (*De Augment. Scient.* lib. viii. c. 2.)

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nevertheless, indisputable; and it is also plain, that a calm unvarnished exposition of tyrannical arts is the bitterest satire against them. Of this Machiavelli himself seems to have been fully aware, when he observed, in reply to a remark which had been made upon this very work, that if he had taught princes to be tyrants, he had also taught the people to destroy tyrants. The *Prince* must, therefore, have had the double aspect here pointed out, though neither of the objects thereby indicated had actually been in the contemplation of the author. It may not be the object of the chemist to teach the means of exhibiting antidotes, any more than of administering poisons; but his pupils or readers may employ his discoveries for both objects. Aristotle had long before given a similar theory of tyranny, but without the suspicion of an immoral intention; nor was it any novelty, in more recent times, amongst those who must have been the first teachers of Machiavelli. The schoolmen followed the footsteps of Aristotle too closely to omit so striking a passage as that to which we have alluded (*Politie*. lib. v. c. 3); and, in fact, Aquinas explains it in his commentary, like the rest, with most unsuspecting simplicity. To us, accordingly, the plan of Machiavelli, like those of former writers, appears to have been purely scientific; and so Lord Bacon seems to have understood him, where he gives him thanks for exposing openly, and without reserve, what princes actually do, not what they ought to do. Great defects of character are no doubt manifested by the writings of Machiavelli. But if a man of so powerful a genius had shown a mind utterly depraved, it would have been a painful and perhaps solitary exception to the laws of human nature; and certainly no depravity can be conceived greater than a deliberate intention to teach perfidy and cruelty. That a man who was a warm lover of his country, who underwent cruel sufferings for her liberty, and who was esteemed by the very best of his countrymen (*e.g.* Guicciardini, his political opponent), should fall into such unparalleled wickedness, may be considered as wholly incredible. The author of the *Prince*, according to the common notion of its intention, could never have inspired such sentiments, had he been a man steeped in depravity, and devoid of all virtuous feeling. To possess the power, however, of contemplating tyranny with scientific coldness, and of rendering it the mere subject of theoretical speculation, must be owned to indicate a defect of moral sensibility. But, to say nothing of the political maxims then received, and of the lenity with which the Italians regarded those crimes which required self-command, address, quick observation, fertile invention, and profound knowledge of human nature, the *Prince* was obviously wrung from the author by the pressure of severe distress; and it is more than probable, that, but for his misfortunes, this famous treatise would never have seen the light.¹

The most ample and esteemed edition of the works of Machiavelli is that of 1813, *Italia* (Florence), in eight vols. 8vo. The best of the French translations is that of Guiraudet and Hochet, Paris, 1799, in 9 vols. 8vo. Those of Gohorry, Paris, 1571 and 1635, of the Sieur de Briencour, Rouen (Paris), 1664, and of Tétard, Haguc, 1691–1696, reprinted in 1743, were very incomplete. Of the English translations of Machiavelli, there is one by Farnsworth, 2 vols. 4to, London, 1762; and another, entitled *The History of Florence, and of the Affairs of Italy, from the earliest Times to the Death of Lorenzo the Magnificent; together with "The Prince," and various Historical Tracts*, London, 1 vol. 8vo, 1847. (J. B—E.)

MACHINE. See MECHANICS.

MACHINLLETH, a parliamentary borough and mar-

ket-town of Wales, Montgomeryshire, near the confluence of the Dulas and Dovey, 35 miles W. from Montgomery. It stands in a pleasant valley, and consists of well built and spacious streets. The chief edifices are the town-hall, built in 1783, and used also as a market-house; and the church, a plain but tasteful building, with an embattled tower. An old house situate here constituted the senate-hall, where the lords and commons of Wales assembled in 1402 at the call of Owen Glyndwr, whom they acknowledged and crowned Prince of Wales. The manufactures of the town are unimportant, comprising chiefly wool and leather; but a brisk trade is carried on in the produce of the county. Machinlleth is supposed to have been the Maglona of the Romans—a military station, erected to overawe the mountaineers. Some Roman remains are found in the vicinity. Machinlleth combines with Newtown, Welshpool, Llanidloes, Montgomery, and Llanfyllin, in returning a member to parliament. Market-day, Wednesday. Pop. (1851) 1673.

MACKENZIE, SIR ALEXANDER, a well-known navigator, was a native of Scotland, and emigrated to Canada at an early age. After being engaged for some years at Fort Chipewyan in the north-west fur trade, he formed the project of reaching, by an overland route, the coast of the Northern Polar Ocean. Starting from Chipewyan on the 3d of June 1789, with a company, in four canoes, he sailed down the Slave River to its outlet in the Slave Lake. He then coasted along the lake, and reaching its western extremity, entered the river which afterwards received his name. Following the stream in its N.W. course, he issued forth into the Great Frozen Ocean on the 15th of July, and had thus achieved an important discovery. Mackenzie returned by the same route, and reached Chipewyan after an absence of more than a hundred days. A more arduous adventure was his overland journey to the North Pacific. He set out in October 1792, sailed for a considerable distance up Peace River, and after braving numerous hardships and dangers, reached his destination in July 1793. He followed the same track on his return. Mackenzie afterwards repaired to England, and published his *Voyages through North America to the Frozen and Pacific Oceans in 1789 and 1793*, 4to, London, 1801. In 1802 his successful enterprises were rewarded by the honour of knighthood. He died in 1820.

MACKENZIE, Sir George, a learned writer and eminent lawyer of Scotland, was the grandson of Kenneth, first Lord Mackenzie of Kintail, and the nephew of Colin and George, first and second Earls of Seaforth. He was born at Dundee in 1636; and after passing through the usual course of education in his own country, he was sent to the university of Bourges, at that time denominated the Athens of lawyers, where he remained three years. Young Scotchmen intended for the bar, having no sufficient means of instruction in the Roman law at home, were then accustomed to frequent the university of Bourges, as in later times they repaired to those of Utrecht and Leyden. He was called to the bar in the year 1656, and had risen into considerable practice before the Restoration. Immediately after the Restoration he was appointed one of the justices-depute,—criminal judges who exercised that jurisdiction which was soon afterwards vested in five lords of sessions, under the denomination of commissioners of justiciary; and in 1661, he and his colleagues were ordained by the parliament "to repair, once in the week at least, to Musselburgh and Dalkeith, and to try and judge such persons as are ther or therabouts delate of witchcraft."

Mackenzie's name appears in the parliamentary proceedings as counsel in almost every cause of importance; and

¹ See *Edinburgh Review*, vol. xxvii., pp. 213, 214.

Mackenzie's connection in that character with the Marquis of Argyll gives no small weight to a passage in his *Memoirs* respecting a circumstance in the trial of that nobleman, which has been the subject of much historical controversy. Between the years 1665 and 1667 he was knighted. He represented the county of Ross during the four sessions of the parliament which was called in 1669. In 1667 he had been appointed lord-advocate in the room of Sir John Nisbet. By that preferment he was, unhappily for his character, implicated in all the worst acts of the Scotch administration of Charles II. Having betrayed some repugnance, however, to concur in those measures which openly and directly led to the re-establishment of Popery, he was removed from his office in 1686, and (which is not a little remarkable) reinstated in 1688, when such measures were still more avowedly pursued.

At the Revolution he adhered to the fortunes of his royal master. Being elected a member of the convention, he supported the pretensions of King James with courage and ability. King William had been solicited by some eager partisans to declare Mackenzie and a few others incapable of holding any public office; but he refused to accede to the proposal. At this critical juncture Sir George Mackenzie composed and delivered his inaugural address on the foundation of the library of the Faculty of Advocates, which he had been mainly instrumental in establishing; a circumstance evincing no inconsiderable degree of firmness and intrepidity. When the death of Dundee destroyed the hopes of his party in Scotland, he took refuge in Oxford, the natural asylum of so learned and inveterate a Tory. But, under the tolerant government of King William, he appears to have enjoyed, in perfect security, his ample fortune, the fruit of his professional labours.

In the spring of 1691, Sir George Mackenzie went to London, where he contracted a disorder which carried him off. He died in St James's Street, on the 2d of May 1691; and his death is mentioned as that of an extraordinary person by several of those who recorded the events of their time. His body was conveyed by land to Scotland, and interred with great pomp and splendour in the Greyfriars churchyard, Edinburgh; a circumstance which shows how little the administration of William was disposed to discourage the funeral honours paid to its most inflexible opponents.

The writings of Sir George Mackenzie are literary, legal, and political. His *Miscellaneous Essays*, both in prose and verse, considered as the elegant amusements of a statesman and lawyer, afford evidence of the refinement of his taste and the variety of his accomplishments. In several of his moral essays, both the subject and the manner betray an imitation of Cowley; and we find Evelyn and Dryden speaking highly of his merits as a writer.

His work, *On the Laws and Customs of Scotland in Matters Criminal*, published in 1678, and dedicated to the Duke of Lauderdale, is an ingenious and plausible production.

The works of Sir George Mackenzie were published at Edinburgh in two volumes folio, in 1716 and 1722. A *History of the Affairs of Scotland from the Restoration of King Charles II. 1660, to the [year] 1691*, was published at Edinburgh in 1821, 4to, under the editorial superintendence of Mr Thomas Thomson, who, in an able preface, related the singular circumstances in which the manuscript was rescued from destruction. It is to be regretted, however, that the portion thus published ends at the very time when the author's means of information became more ample. For many reasons, it would be highly desirable to possess the sequel of these *Memoirs*. (See *Edinburgh Review*, xxxvi. 1.)

MACKENZIE, Henry, was born at Edinburgh, in August 1745. His father, Dr Joshua Mackenzie, was an eminent physician in that city, the author of a volume of *Medical*

and *Literary Essays*; his mother was the eldest daughter of Mackenzie Rose of Kilravock, an ancient family in Nairnshire.

After being educated at the High School and University of Edinburgh, Mr Mackenzie entered upon the study of exchequer business. In 1765 he went to London to study the modes of English exchequer practice. Whilst there, his talents induced a friend to solicit his remaining in London to qualify himself for the English bar; but the wishes of his family, and the moderation of his own unambitious mind, decided his return to Edinburgh, where he ultimately became attorney for the crown. When in London he sketched some part of his first and very popular work, *The Man of Feeling*, which was published anonymously in 1771. The great popularity of this volume gave occasion to a remarkable fraud on the part of a Mr Eccles of Bath, who, taking advantage of the book being anonymous, laid claim to the authorship, transcribed the whole in his own hand, with interlineations and corrections, and maintained his right with such plausible pertinacity, that Messrs Cadell and Strahan, Mr Mackenzie's publishers, found it necessary to undeceive the public by a formal contradiction. *The Man of the World* was published a few years after *The Man of Feeling*, and breathes the same tone of exquisite sensibility. In his first publication he imagined a hero constantly obedient to every emotion of his moral sense. In *The Man of the World* he exhibited, on the contrary, a person rushing headlong into vice and ruin, and spreading misery all around him, by grasping at happiness in defiance of the moral sense. His next production was *Julius de Roubigné*, a novel in a series of letters. The fable is very interesting, and the letters are written with great elegance and propriety of style. In 1777 or 1778, a society of gentlemen in Edinburgh, mostly lawyers, projected the publication of a series of papers on morals, manners, taste, and literature, similar to those of the *Spectator*. Their scheme was speedily carried into effect, and the papers, under the title of the *Mirror*, of which Mr Mackenzie was the editor, were published in weekly numbers. The whole, with the names of the respective authors, were afterwards republished in three duodecimo volumes. To the *Mirror* succeeded the *Lounger*, a periodical of a similar character, and equally successful. Mr Mackenzie was the most valuable contributor to both these works. He contributed forty-two papers to the *Mirror*, and fifty-seven to the *Lounger*. They are distinguished from all the rest by that sweetness and beauty of style, and tenderness of feeling, which form the peculiar character of his writings. In the *Lounger* Mr Mackenzie was the first to appreciate the genius of Burns, in a review of his poems, then recently published, which at once drew the unknown poet from obscurity into the full blaze of a fame that will never die. On the institution of the Royal Society of Edinburgh, Mr Mackenzie became one of its members; and enriched the volumes of its *Transactions* with an elegant tribute to the memory of his friend Judge Abercrombie, and a memoir on German tragedy, the latter of which bestows high praise on the *Emilia Galotti* of Lessing, and on the *Robbers* by Schiller. He also published, in 1791, a small volume containing translations of the *Set of Horses* by Lessing, and of two or three other dramatic pieces. In the *Transactions of the Highland Society* he wrote an account of the origin and proceedings of that association, and published a view of the controversy respecting the poems of Ossian, in which he attempted to vindicate their authenticity; and in the same paper gave a spirited and interesting account of Gaelic poetry. In 1793 he wrote the *Life of Dr Blacklock*, prefixed to the quarto edition of the works of the blind poet; and in 1812 he read to the Royal Society a memoir of John Home, author of *Douglas*, in which he gives a sketch of the literary society of Edinburgh during the latter part of the last century.

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Mr Mackenzie was not so fortunate as a writer of dramas. Several of his plays were brought out at different theatres, but, though possessed of considerable merit as literary productions, they were not successful on the stage. He wrote several political tracts in the Tory interest, which procured him the countenance and respect of Mr Pitt and other illustrious statesmen of his time, and led to his being appointed, in 1804, comptroller of taxes for Scotland. He died at Edinburgh on the 14th of January 1831, in the eighty-sixth year of his age.

A complete edition of his works was published at Edinburgh, in eight volumes 8vo, in 1808.

MACKENZIE RIVER, a large river of British North America, N.W. territory, rises in the Great Slave Lake, flows in a N.W. direction, and falls into the Arctic Ocean by numerous mouths, after a course of about 900 miles. It is generally about 3 miles in width, and the delta at its mouth, formed by flat alluvial islands, is 90 miles in length, by from 15 to 40 in width. The principal affluents are,—the Mountain and Peel Rivers, and the Great Bear Lake River, which brings down the surplus waters of that lake. Mackenzie River is named after Alexander Mackenzie, by whom it was discovered and navigated in 1789.

MACKINTOSH, THE RIGHT HONOURABLE SIR JAMES, one of the most distinguished men of his time, and who attained to great eminence in literature, philosophy, history, and politics, was born at Aldourie, on the banks of Loch Ness, Scotland, on the 24th of October 1765. His father, Captain John Mackintosh, was the representative of a family which had for above two centuries possessed a small estate called Kellachie, in Inverness-shire. He had served long in the army, which he entered very young, and had been severely wounded at the battle of Fellinghausen, in the Seven Years' War. His mother was Marjory Macgillivray, daughter of Mr Alexander Macgillivray by Anne Fraser, sister of Brigadier-General Fraser, who was killed in General Burgoyne's army in 1777.

In the summer of 1775 young Mackintosh was sent to school at the town of Fortrose; and he had scarcely learned to read when he evinced that predilection for abstract speculation which afterwards formed so prominent a feature of his intellectual character. A gentleman having lent him Burnet's *Commentary on the Thirty-nine Articles*, he perused it with great avidity; and the part which struck him most forcibly, and which he read with peculiar eagerness and pleasure, was the commentary on the seventeenth article, which relates to predestination; a strange subject to engage the attention and interest the understanding of a mere boy. His mind appears to have revolted at the doctrine of eternal decrees of election and reprobation; though surrounded by orthodox Calvinists, he became a warm advocate for free will; and before he had completed his fourteenth year, he was probably the boldest heretic in the county. About the same time he read the old translation of Plutarch's *Lives*, Echard's *Roman History*, and the works of Pope and Swift. His first poetical attempt was a pastoral, or elegy, on the death of his uncle, Brigadier-General Fraser, who fell on the 7th of October 1777; and in 1779 and 1780 his muse was exceedingly prolific, and he even commenced an epic poem on the defence of Cyprus by Evagoras, King of Salamis, against the Persian army.

In October 1780 he entered King's College, Aberdeen, where he remained during that and the three following sessions. At Aberdeen he was by common consent recognised as *inter studiosos facile princeps*; whilst his courteous demeanour, refined manners, playful fancy, and easy flow of elocution, rendered him a general favourite amongst his companions. His chief associate at King's College was the late Reverend Robert Hall, whom the exclusive system of the English universities had forced to seek in this northern

seminary for that academical education which was denied to him, as a Dissenter, in his own country. Like Castor and Pollux, these young men were assimilated in the minds of all who knew them by reason of the equal splendour of their talents, although in other respects they were extremely unlike.

In the spring of 1784, having previously taken his degree of Master of Arts, he finally quitted King's College, "with," he says, "but little regular and exact knowledge, but with considerable activity of mind, and boundless literary ambition;" and in the October following he set out for Edinburgh to commence the study of physic, which he had made choice of as a profession. His arrival in that city opened a new world to his mind. Edinburgh was then the residence of many eminent men; of Adam Smith, Dr Black, John Home, Henry Mackenzie, Dr Cullen, Principal Robertson, Dr Ferguson, Dr Hutton, Professor Robison, Mr Dugald Stewart, and others. He was admitted a member of the Speculative Society, which had been established about twenty years before, and which had general literature and science for its objects. In this exciting atmosphere, speculation rather than study engrossed his attention. Speculators, indeed, are seldom submissive learners. Those who will make proficiency in useful knowledge, must for a time trust to their teachers, and believe in their superiority; but those who too early think for themselves must sometimes imagine themselves wiser than their masters; and hence docility is often extinguished when the work of education is scarcely commenced. After three years spent in Edinburgh, he obtained the degree of M.D. in 1787; and early in 1788 he set out for London. His views were, in the first instance, directed to the medical profession; and he was led from circumstances to contemplate a medical appointment in Russia. But this project, in which he was supported by Mr Dugald Stewart, did not take effect; and it is probable that he felt but little regret at the failure of a scheme which would have removed him from such a scene of interest and enjoyment as London then presented. On the 18th of February 1789 he was privately married to Miss Catharine Stuart, a young lady of a respectable Scotch family; and at the age of twenty-four he found himself with no prospect of any immediate professional settlement, his little fortune rapidly diminishing, and a wife to provide for.

The struggle regarding the regency that followed the announcement of the malady with which the king had been attacked in the autumn of 1788, was the occasion of a pamphlet by Mr Mackintosh, in support of the analogy which Mr Fox endeavoured to establish between the actual state of his majesty and a natural demise of the crown. This seems to have been his first public appearance in the field of politics, for which his mind had now taken a decided turn. About the same time he made the acquaintance of Horne Tooke, whose cause he warmly espoused at the election for Westminster. In the autumn of 1789 he made a tour, in company with his wife, through the Low Countries to Brussels; and, upon his return to London, contributed a number of articles on Belgium and France to the *Oracle* newspaper, with which he appears to have been for some time connected. To the same date must be referred his resolution to devote himself to the study of the law. Hitherto the exercise of his powers had been almost exclusively confined to the columns of a newspaper; but although the most successful efforts of ability are often passed unheeded, or make but a feeble and transitory impression where such are neither looked for nor expected, yet this preliminary training was not without its advantage, and the time now approached when he was to appear before the world in a higher and more independent character.

The extraordinary impression produced by the publication of Mr Burke's *Reflections on the French Revolution*, the

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admiration excited by the work in some quarters, and the vehement indignation with which it was greeted in others, are matters of universal notoriety. By some it was regarded as the most marvellous union of wisdom and genius that had ever appeared in the world, whilst to others it seemed inconsistent with the former life and opinions of the author, notwithstanding that an abhorrence for abstract politics, a predilection for aristocracy, and a dread of innovation, had always been articles of his political creed. A multitude of pamphlets appeared in opposition to it, and each shade of opinion was warmly defended against the common enemy of all change. The great majority of these productions, however, with the exception of Paine's *Rights of Man*, soon fell into oblivion. But whilst Mr Burke was sustaining the attack of the man who had been his fellow-combatant in the American contest for freedom, "a bolt was shot from amongst the undistinguished crowd, but with a force which showed the vigour of no common arm." The *Vindiciæ Gallicæ* was published in April 1791. It had been finished in a great hurry, but, with all its imperfections and defects, it at once placed the author in the first rank of the party in this country who were upholding the cause of France. He was courted and caressed on all hands, his company was eagerly sought for, and, as he himself expressed it, he was for a few months the lion of the place.

In Michaelmas term 1795, Mr Mackintosh was called to the bar, and attached himself to the home circuit. Having thus entered upon a path which, when pursued by the patient steps of genius and industry, so often leads to wealth and distinction, he evidently enjoyed the satisfaction which arises from having in view a constant and honourable occupation. But a severe affliction awaited him in the death of his wife, which took place early in 1797. In 1799 Mr Mackintosh formed the plan of giving lectures upon the *Law of Nature and of Nations*. The benchers of Lincoln's Inn granted him the use of their hall, and he commenced his course by an exposition of the general aim and scope of the undertaking, as well as of the views and feelings which had led him to embark in it. This discourse, which the lecturer was induced to publish, had no sooner issued from the press than commendations poured in upon him from every quarter. Mr Pitt, Lord Loughborough, Dr Parr, and others, united their suffrages in its praise; and it must be confessed that if Mackintosh had published nothing else than this discourse, he would have left a striking monument of his intellectual strength and symmetry. His political opinions, indeed, had undergone a considerable change; and as the tone of these lectures differed materially from that of the *Vindiciæ Gallicæ*, and of the *Letter to Mr Pitt*, this circumstance, together with the support ostentatiously given to them by the ministers of the day and their connections, served to alienate from him several of his old political friends, and to beget suspicions for which there existed no solid foundation.

We come now to an event of great importance in the life of Mr Mackintosh; we mean the trial of M. Peltier, an emigrant royalist, for a libel on the First Consul of France. The address delivered by Mr Mackintosh, as counsel for the accused, formed one of the most splendid displays of eloquence ever exhibited in a court of justice, and it will, beyond all doubt, maintain its place amongst the few efforts of forensic oratory which have survived the occasions that produced them, and are preserved as models for future artists in the same line. "I perfectly approve of the verdict," said Mr. afterwards Lord Erskine; "but the manner in which you opposed it, I shall always consider as one of the most splendid monuments of genius, learning, and eloquence." This trial took place on the 21st February 1803, and some months afterwards, Mr Mackintosh was appointed to the office of recorder of Bombay, vacant by the death of Sir William Syer. Upon his appointment, he received the

customary honour of knighthood, and, early in 1804, sailed with his family for India. His time there appears to have been divided between the discharge of his official duties, literary occupations somewhat irregularly pursued, correspondence with his numerous friends in Europe, and occasional excursions into different parts of the country. The experiment, however, was not successful, in as far as regarded the views which had induced him to solicit the appointment. For although we now know that his mind was in a state of great vigour and activity during the whole of his residence in India, yet he was not enabled to accomplish, indeed scarcely to commence, any of the great works he had contemplated; whilst his habitual inattention to economy prevented any great improvement in the state of his worldly affairs. The consequence was, that he returned to England in 1812, with broken health and spirits, uncertain prospects, and vast materials for works which were never to be completed.

Mr Percival, now at the head of the government, offered him a seat in parliament, and an early promotion to the head of the Board of Control. These tempting offers, however, he declined. But he was almost immediately returned on the Whig interest, as member for the county of Nairn. After this his life scarcely admits of any detailed abstract. He continued in parliament, and true to liberal principles for the remainder of his days. In 1818 he was appointed professor of law at Haylebury, and resigned that situation in 1827. He contributed articles of great value to the *Edinburgh Review*; and in a "Preliminary Discourse" to the present work, being the second in order, furnished a very able history of ethical philosophy, which has been printed separately in 8vo, with a preface by Professor Whewell of Cambridge. After printing several volumes of a popular and abridged *History of England*, which contains more thought and more lessons of wisdom than any other history with which we are acquainted, he left at his death the invaluable fragment of the *History of the Revolution of 1688*, of which a very masterly account will be found in Mr Macaulay's *Crit. and Hist. Essays*, 1852, p. 305. Under Lord Grey's administration, in 1830, he was appointed to a seat at the Board of Control, and cordially co-operated in all the great measures of reform which were then brought forward and carried after a severe struggle. He died in 1832, regretted with more sincerity, and admired with less envy, than any man of his age. In him, perhaps more than in any man of his time, was exemplified that *mitis sapientia*, which formed the distinguishing attribute of the illustrious friend of Cicero, and which wins its way into the heart, whilst it at once enlightens and satisfies the understanding.

With regard to the intellectual character of Sir James Mackintosh, we cannot do better than quote the words in which the able writer who reviewed the *Memoirs of his Life*, by his son, in that journal to which he was so valuable a contributor, has described, or rather portrayed it:—"His intellectual character cannot be unknown to any one acquainted with his works, or who has even read many pages of the memoirs now before us; and it is needless, therefore, to speak here of his great knowledge, the singular union of ingenuity and soundness in his speculations—his perfect candour and temper in discussion—the pure and lofty morality to which he strove to elevate the minds of others, and in his own conduct to conform,—or the wise and humane allowance which he was ready, in every case but his own, to make for the infirmities which must always draw down so many from the higher paths of their duty. These merits, we believe, will no longer be denied by any who have heard of his name or looked at his writings. But there were other traits of his intellect which could only be known to those who were of his acquaintance, and which it is still desirable that the readers of these memoirs should

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bear in mind. One of these was that ready and prodigious memory, by which all that he learned seemed to be at once engraved on the proper compartment of his mind, and to present itself at the moment it was required; another, still more remarkable, was the singular maturity and completeness of all his views and opinions, even upon the most abstruse and complicated questions, though raised, without design or preparation, in the casual course of conversation. In this way it happened that the sentiments he delivered had generally the air of recollections—and that few of those with whom he most associated in mature life could recollect of ever catching him in the act of making up his mind in the course of the discussions in which it was his delight to engage them. His conclusions, and the grounds of them, seemed always to have been previously considered and digested; and though he willingly developed his reasons, to secure the assent of his hearers, he uniformly seemed to have been perfectly ready, before the cause was called on, to have delivered the opinion of the court, with a full summary of the arguments and evidences on both sides. In the work before us, we have more peeps into the preparatory deliberations of his great intellect—that scrupulous estimate of the grounds of decision, and that jealous questioning of first impressions, which necessarily precede the formation of all firm and wise opinions,—than could probably be collected from the recollections of all those who had most familiar access to him in society. It was owing, perhaps, to this vigour and rapidity of intellectual digestion that, though all his life a great talker, there never was a man that talked half so much, who said so little that was either foolish or frivolous; nor any one perhaps who knew so well how to give as much liveliness and poignancy to the most just and even profound observations as others could ever impart to startling extravagance and ludicrous exaggeration. The vast extent of his information, and the natural gaiety of his temper, made him independent of such devices for producing effect, and, joined to the inherent kindness and gentleness of his disposition, made his conversation at once the most instructive and the most generally pleasing that could be imagined.” (J. B.—E.)

MACKLIN, CHARLES, an eminent actor and dramatic writer, was born in the county of West Meath, Ireland, about 1690. He was apprenticed to a saddler at the age of fourteen, but not relishing that occupation, he ran away, and after some adventures in England, became badgeman at Trinity College, Dublin, a position which he gave up in 1716 to try his fortune as an actor at the theatre of Lincoln's Inn Fields, London. Macklin's success in this new sphere was very encouraging; and in 1741 he established his fame as a player in the character of *Shylock*, a part to which he gave the tragic reading since universally adopted. He absented himself from the stage from 1753 to 1759, and was engaged as a tavern-keeper and lecturer on oratory and criticism in the Piazza, Covent Garden. Failing in this scheme, he resumed his histrionic art at Drury Lane; but his mind giving way, he was compelled finally to leave the stage in 1789. Macklin died in 1797, at the great age of 107. Of his ten dramatic pieces, the most noted are,—*The Mun of the World*, and *Love à la Mode*. (See his *Memoirs* by Kirkman, 2 vols. 8vo, London, 1799.)

MACKNIGHT, DR JAMES, a learned Scottish divine, was the son of the minister of Irvine, in Ayrshire, and was born in that town in 1721. From the school of his native place he was removed about the age of fourteen to the university of Glasgow, and studied there with great success. At the completion of the ordinary curriculum he repaired to Leyden to study theology. On his return he was licensed as a preacher, and after officiating as an assistant, first at the Gorbals, in Glasgow, and afterwards at Kilmwinning, he was ordained in 1753 minister of Maybole, in Ayrshire. His first work, *The Harmony of the Gospels*, appeared in

1756, and passed through a second edition in 1763. In 1763 this latter year was also published his *Truth of the Gospel History*. So well known had Macknight now become, that he received a diploma of D.D. from the university of Edinburgh, and in 1769 was elected moderator of the General Assembly. During this year he was translated to the parish of Jedburgh; but after the lapse of three years, was promoted to Lady Yester's church, Edinburgh. In 1778 he was transferred to the Old Church in the same city, a charge which he held during the rest of his life. For a long time he had been composing, with persevering and elaborate care, his *New Translation of the Apostolical Epistles, with a Commentary and Notes*. It appeared in 1795, and was praised by the ablest divines of all denominations in Britain. After passing his latter years in a total cessation from literary labour, he died in December 1799. The fifth edition of his *Harmony* was published, London, 1819, and his *Translation*, London, 1809.

MACLAURIN, COLIN, a very eminent mathematician and philosopher, was the son of a clergyman, and born at Kilmoddan, Argyleshire, Scotland, in 1698. In the year 1709 he was sent to the university of Glasgow, where he continued five years, and applied himself intensely to study. His great genius for mathematical learning discovered itself as early as the age of twelve, when, having accidentally met with a *Euclid* in a friend's chamber, he became in a few days master of the first six books without any assistance; and it is certain, that in his sixteenth year he had invented many of the propositions which were afterwards published under the title of *Geometria Organica*. In his fifteenth year he took the degree of Master of Arts, and on that occasion composed and publicly defended, with great applause, a thesis on the power of gravity. After this he quitted the university, and retired to the country seat of an uncle, who had the care of his education, for his parents had been some time dead. Here he spent two or three years in pursuing his favourite studies; but, in 1717, he offered himself as a candidate for the professorship of mathematics in the Marischal College of Aberdeen, and obtained it after a ten days' trial with a very able competitor. In 1719 he went to London, where he became acquainted with Sir Isaac Newton and other eminent men, at which time also he was admitted a member of the Royal Society.

In 1722 Lord Polwarth, plenipotentiary of the King of Great Britain at the Congress of Cambray, engaged him to become tutor and companion to his eldest son, who was then about to set out on his travels. After a short stay at Paris, and visiting other towns in France, they fixed their residence in Lorraine, where Maclaurin wrote his tract on the percussion of bodies, which gained the prize of the Royal Academy of Sciences for the year 1724. But his pupil dying soon afterwards at Montpellier, he returned immediately to his professorship at Aberdeen. He was hardly settled there, however, when he received an invitation to Edinburgh,—the curators of that university being desirous that he should supply the place of Mr James Gregory. He had some difficulties to encounter; but at length these were all surmounted, principally through Sir Isaac Newton, and he was introduced into the university in November 1725.

In the year 1733 he married Anne, the daughter of Mr Walter Stewart, solicitor-general for Scotland. In 1734, Berkeley, Bishop of Cloyne, published a piece called *The Analyst*, in which he took occasion, from some disputes which had arisen concerning the grounds of the method of fluxions, to attack the method itself, and also to charge mathematicians in general with infidelity in religion. Maclaurin thinking himself included in this charge began an answer to Berkeley's book; but, as he proceeded, so many new theories and problems occurred to him, that instead of a vindictory pamphlet, his work became a complete system of fluxions, with their application to the most important

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problems in geometry and natural philosophy. This work was published in Edinburgh in 1742, in 2 vols. quarto, and is the most considerable of all his works. In the meantime, he was continually bringing forward some performance or observation of his own, many of which were published in the fifth and sixth volumes of the *Medical Essays* at Edinburgh. Some of them were likewise published in the *Philosophical Transactions*, particularly,—1. Of the Construction and Measure of Curves; 2. A New Method of describing all kinds of Curves; 3. A Letter to Martin Folkes, Esq., on Equations with Impossible Roots, May 1726; 4. Continuation of the same, March 1729; 5. On the Description of Curves, with an account of farther improvements, and a paper dated at Nancy, November 27, 1722; 6. An account of the Treatise of Fluxions, January 27, 1742; 7. The same continued, 10th March 1742; 8. A Rule for finding the Meridional parts of a Spheroid with the same exactness as of a Sphere, August 1741; 9. Of the Basis of the Cells wherein the Bees deposit their Honey, 3d November 1734.

When the Earl of Morton set out in 1739 for Orkney and Zetland, to visit his estates there, he desired Mr Maclaurin to assist him in settling the geography of these islands, which was then very erroneous in all maps; to examine their natural history, survey the coasts, and measure a degree of the meridian. Maclaurin's family affairs, and other connections, would not permit him to do this; he, however, drew up a memorial of what he thought necessary to be observed, furnished the proper instruments, and recommended Mr Short, the optician, as a fit person for the management of them. He had still another scheme for the improvement of geography and navigation, of a more extensive nature, which was not destined to succeed, viz., the opening of a passage from Greenland to the South Sea by the north pole.

In 1745, having been very active in fortifying the city of Edinburgh against the Highland army, he was obliged to fly from thence to the north of England, where he was invited by Herring, then Archbishop of York, to reside with him during his stay in this country. In this expedition, however, being exposed to cold and hardships, and naturally of a weak and delicate constitution, he laid the foundation of an illness which put an end to his life, in June 1746, at the age of forty-eight.

Mr Maclaurin was a good as well as a great man, and his peculiar merit as a philosopher consisted in this, that all his studies were accommodated to general utility; and we find, in many places of his works, an application even of the most abstruse theories to the perfecting of the mechanical arts. In his lifetime, however, he had frequent opportunities of serving his friends and his country by his great skill. Whatever difficulty occurred concerning the constructing or perfecting of machines, the working of mines, the improvement of manufactures, the conveying of water, or the execution of any other public work, he was at hand to resolve it.

Of his works, we have mentioned the *Geometria Organica*, in which he treats of the description of curve lines by continued motion. We need not repeat what has been said concerning the paper which gained the prize of the Royal Academy of Sciences in 1724. In 1740 the academy adjudged him a prize, which did him still more honour, for solving the motion of the tides from the theory of gravity,—a question which had been given out the previous year, but without receiving any solution. He had only ten days to draw up this paper, and could not find leisure to transcribe a fair copy, so that the Paris edition of it is incorrect. He afterwards revised the whole, and inserted it in his *Treatise of Fluxions*, as he did also the substance of the former paper. These, with the *Treatise of Fluxions*, and the pieces printed in the *Philosophical Transactions*, of

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which we have given a list, are all the writings which Maclaurin lived to publish. Since his death, two more volumes have appeared, containing his *Algebra*, and his *Account of Sir Isaac Newton's Philosophical Discoveries*. His *Algebra*, though not finished by himself, is yet allowed to be excellent of its kind, containing, in a volume of no great bulk, a complete elementary treatise of that science, as far as it had then been carried. (See the Fourth and Fifth DISSERTATIONS prefixed to this work.)

MACNEILL, HECTOR, a distinguished Scottish poet, born on the 22d of October 1746, at Rosebank, on the Esk, and almost amongst the classic woods of Hawthornden, was descended from an old respectable family in the south of Argyllshire. Pecuniary circumstances forced his family from this choice retreat, to occupy a farm on the banks of Loch Lomond, where part of the boyhood of Hector was spent.

His early education, with the exception of a short time spent at school in the neighbourhood, was solely conducted by his father at home, who, along with the common branches, carefully imbued his mind with piety and good morals, and, with parental fondness and pride, also encouraged his boyish passion for the muses. Preparatory to going to Bristol to the house of a wealthy mercantile relative, young Hector was, at the age of twelve, sent to Glasgow for two years, to acquire those branches immediately applicable to a commercial life. On his arrival at Bristol, he was occupied for a short time in the counting-house of his relative, and in completing his commercial education previously to his departure for the West Indies. After spending six years in Antigua and Granada, he returned to his native land with the acquisition of the French language, but with no more wealth than when he departed.

Both his mother and sister had died in his absence, and his father did not survive his return above a year and a half. The small inheritance to which he thus succeeded he sunk in an annuity, which, however, he unfortunately lost by bankruptcy.

In this emergency, through the interest of a friend in London, he was appointed to the office of assistant-secretary in the flag-ship of Admiral Geary. Having made two cruises, he resigned this situation, and soon afterwards undertook the same office in the flag-ship of Sir Richard Bickerton, appointed to the East India station. During this service he was present in the last naval engagement with the able French commander Suffrein.

Before leaving India he visited Surat, and the sculptured excavations of Elephanta. An account of these singular remains he afterwards published in the *Archæologia* in 1787. Neither enriched with the gold of India, nor secured in a competence by a permanent appointment, he returned to Scotland after an absence of five years.

He retired for two years to a humble residence in the neighbourhood of Stirling, where he produced the beautiful descriptive poem of *The Links of Forth*.

The exhausted state of his pecuniary resources, however, compelled him to revisit the West Indies, where he was appointed to an office in the custom-house at Kingston, Jamaica; but the debilitating effects of fever, and other circumstances connected with his duties, induced him to return to his native country. At the request of his friend Dr Currie, he drew up an impartial statement *On the treatment of the Negroes*, which was published at Liverpool in 1788.

Upon his passage home he composed the second canto of the sweetly wild poem of *The Harp*, founded on a tradition of the Hebrides, and communicated to him by Graham of Gartmore, with whom, on his return to Stirlingshire, he lived for nearly two years.

Being afflicted with a nervous disorder, which, by im-

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proper treatment, continued about six years, he fixed his residence for a time in a cottage near the field of Bannockburn. Here, while suffering greatly from his malady, he composed *Scotland's Skaithe*, the happiest effort of his genius.

In the hope of recovery from his long-protracted complaints, although by many deemed irremediable, he again sailed for Jamaica. This voyage happily contributed alike to restore his health and to afford him a future competence. By the death of one of the companions of his boyhood, the Grahams of Three-Mile-River, he now received a legacy, and the surviving brother settled on him an annuity for life. Under his friendly roof, previously to his return, he wrote *The Scottish Muse*, descriptive of the various vicissitudes of his own poetical life.

With the well-deserved emoluments of his poetical labours, and another bequest of an intimate medical friend in Jamaica, he returned to Scotland, and spent the evening of his days in the capital of his native land, in the enjoyment of publicly awarded honour, lettered ease, and comparative affluence. Here he published *The Pastoral or Lyric Muse of Scotland* (1808), also two satirical poems, entitled *Town Fashions* (1810), and *Bygone Times and Late Come Changes* (1811). His last literary efforts were *The Scottish Adventurers* (1812), and an unpublished autobiography in three volumes, which has been the chief guide in this brief account. Such were the calm labours of the years spent in Edinburgh, till the 15th March 1818, when he died at an advanced age, leaving a name endared to his countrymen, and embalmed in the song of his fatherland.

From his attachment to truth, he was free, undisguised, and even severe; quick in temper, yet serene and social; proudly honourable, yet warm and benevolent. True to nature and feeling, as a poet he excels in the simple and pathetic; and though his humour and satire be less successful, his manner is serious and his aim uniformly well directed.

A selected edition of his poetical works was published at Edinburgh (1812), in two vols. 12mo. (T. A.)

MACNISH, ROBERT, M.D. and LL.D., was born in Glasgow in 1802, where he practised as a physician, and made extensive contributions to magazine literature under the name of "The Modern Pythagorean." He found leisure also to produce some works of very considerable merit on subjects demanding much patient inquiry and thoughtful sagacity. The best known of these are his *Anatomy of Drunkenness*, *Philosophy of Sleep*, *Metempsychosis*, and *Book of Aphorisms*. He died in 1837.

MACON (the ancient *Matisco*), a town of France, capital of the department of Saône-et-Loire, is situate on the declivity and at the foot of a hill, on the right bank of the Saône, which is here crossed by an old stone bridge of 12 arches, 38 miles N. of Lyons. The town, though pleasantly situate, is ill built, the streets being generally narrow, crooked, and ill paved, and the houses, though mostly of stone, of a dull and sombre appearance. The ramparts that formerly surrounded the town have been laid out in public walks. A handsome quay extends along the bank of the river. The chief public buildings are,—the town-hall, containing a theatre and public library, the old episcopal palace, now the residence of the prefect, the general hospital, the prison, and some of the churches. Macon is the seat of tribunals of primary instance, and of commerce; and has a communal college, society of arts and agriculture, school of design, and a primary normal school. It has no manufactures of importance, being principally dependent on its trade in wine, the produce of the vicinity. Pop. (1851) 12,653.

MACON, a town of the United States of North America, capital of Bibb county Georgia, on both sides of the Ocmulgee, here crossed by a bridge 380 feet in length, 30

miles S.W. of Milledgeville. Being situate at the head of the river navigation, Macon has been steadily increasing in importance. In 1822 it was little more than a village, but now has become the third town in Georgia, both as regards commercial importance and population. Its chief public buildings are,—a court-house, market-house, and a Wesleyan female college founded 1839. Cotton is the staple trade, and is shipped here for the sea-coast in large quantities. In the vicinity there is a much-admired cemetery and a curious mound, supposed by some to be artificial. Pop. (1850) 5953, (1853) about 7000.

MACPHERSON, JAMES, the translator of Ossian, was born at Kingussie, in the county of Inverness, in 1738. He received his school education at Inverness, and afterwards studied at King's College, Aberdeen. In 1758, while schoolmaster of his native village, he published his *Highlander*, a heavy poem in six cantos, which met with no success. On becoming tutor afterwards to the son of Graham of Balgowan, he met Home, the author of *Douglas*, at Moffat, to whom he showed certain verses claiming to be translations of old Gaelic poetry. By the kindness of Home these pieces were submitted to the perusal of Dr Blair, and having elicited the admiration of that critic, were published in 1760, under the title of *Fragments of Ancient Poetry, collected in the Highlands of Scotland, and translated from the Gaelic or Erse Language*. This performance rendered Macpherson exceedingly popular, and gained for him the patronage of such men as Hume and Dr Robertson. So keenly had this specimen of old Celtic literature excited the public curiosity, that money was subscribed to enable Macpherson to rescue what fragments of traditionary poetry yet lingered among the Scottish Highlands. Accordingly he set out, and after exploring the mainland and the isles, published as the result of his tour, *Fingal; an Ancient Epic Poem, in six books, with several other Poems, by Ossian, the son of Fingal*, 4to, 1762; and *Temora, in eight books, with other Poems, by Ossian*, 4to, 1763. These works were read with avidity, were translated into several European languages, and materially increased both the wealth and the fame of Macpherson. Yet even at this early period the enjoyment of his good fortune began to be disturbed by that controversy regarding the authenticity of Ossian which remains unsettled even at this present day. In 1794 he accompanied Governor Johnstone as his private secretary to Pensacola; and after resigning this situation, and holding official appointments at Florida and the West Indies, he returned to England in 1766. Settling down in London, and resuming his literary pursuits, he produced, in 1771, *An Introduction to the History of Great Britain and Ireland*, 4to. The wound which the publication of this work inflicted upon the fame of the author was by no means healed by the prose translation of Homer's *Iliad*, which he produced in 1773. In 1775 he published *The History of Great Britain from the Restoration to the Accession of the House of Hanover*, in 2 vols. 4to. Appointed soon after this to defend the proceedings of the government towards America, he wrote a pamphlet entitled *The Rights of Great Britain Asserted against the Claims of the Colonies*, 8vo, 1776. In 1779 he produced his *Short History of the Opposition during the last Session of Parliament*, a work which so favourably impressed the public that they generally ascribed it to Gibbon. On his appointment soon afterwards to the lucrative office of agent to the Nawab of Arcot, Macpherson began to ply his facile pen in the treatment of Indian affairs. In his official capacity he sat in parliament as member for Camelford during several years, but never spoke in the house. Towards the close of his life, his declining health induced him to remove to Belleville, a seat which he had bought in his native Strathspey. He died there on the 17th February 1796. In accordance with his own re-

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quest, he was buried in Westminster Abbey, and a monument was erected to his memory on a conspicuous site within his own grounds.

It is now generally agreed that Macpherson caught the spirit of his Ossianic poetry from the tales of the old Celtic bards, but often supplied lacunas in the work from his own invention. To him, therefore, we must ascribe many of the weird images and flowing sentences which sometimes characterize it, as well as the pointless verbiage and false description that often render it irksome.

MACQUER, PIERRE JOSEPH, an eminent chemist, was born at Paris on the 9th of October 1718. He was member of the Academy of Sciences and professor of pharmacy, and was engaged in the *Journal de Sçavans* for articles in medicine and chemistry. With the last of these sciences he was intimately acquainted. He had a share in compiling the *Pharmacopœia Parisiensis*, published in 1758, in 4to, and wrote various valuable works on chemistry. His *Dictionnaire de Chimie* was translated into English by Keir. He died at Paris in 1784.

MACROBIUS, AMBROSIIUS AURELIUS THEODOSIUS, an ancient Latin writer, lived about the beginning of the fifth century. In the preface to his *Saturnalia* he tells us that Latin is not his mother tongue; and from the Græcisms that abound in his style, we infer that he was a Greek. The opinion that he was a Christian rests on no sure basis, and is rendered doubtful by the warm sympathy which is lavished in the work above mentioned on the sanctity and religious opinions of the heathen priest Prætextatus. He had a son, Eustathius, to whom he addressed the introduction to his *Saturnalia*. Nothing more is known respecting him. Only three of the works of Macrobius are extant. His grammatical treatise *De Differentiis et Societatibus Græci Latinique Verbi*, is known to us merely under the form of an abstract by a certain author, Joannes. In his *Commentarius ex Cicerone in Somnium Scipionis* he discourses on the tenets of the later Platonists touching the constitution of the universe. His principal work, *Saturnaliorum Convivialium Libri VII.*, is a collection of heterogeneous discussions on the Saturnalia and the Roman deities, on jesting and feasting, on the poetry of Virgil, and on the physiology of the human frame. The best editions of Macrobius are those of Gronovius, 8vo, Leyden, 1670; and the Bipont, 2 vols., 1788.

MACROOM, a market-town of Ireland, county of Cork, on the River Sullane, 21 miles W. of Cork. It consists chiefly of one long street, occupied chiefly by cabins and other mean dwellings. The principal buildings are,—the parish church, Roman Catholic chapel, school-house, market-house, session-house, bridewell, dispensary, and work-house. Market-day, Saturday. Pop. (1851) 3727

MADAGASCAR, a large and important island in the Indian Ocean, about 300 miles from the coast of Africa, from which it is separated by the Mozambique Channel. Cape Amber, its northern extremity, is situate in S. Lat. 12., whence it extends southward, slightly inclining to the W., about 937 English miles, to Cape St Mary, in S. Lat. 25. 40. Its extreme western shore is in E. Long. 43. 10., and its most easterly cape in E. Long. 50. 30. The breadth of the island increases gradually from the northern point to the centre, where it is widest, being about 350 miles across; while the average breadth of the southern portion is about 250 miles. It has been estimated to contain 150,000,000, or even 200,000,000 acres of land; and though such estimates, in the absence of actual measurements, can only be regarded as approximations to its actual extent, its surface is equal to three-fourths of the territory of France, and larger than Great Britain and Ireland combined.

The coasts of Madagascar contain a number of bays and harbours, some of them spacious and sheltered, and capable of affording excellent and secure anchorage for shipping of

the largest dimensions. Among these may be specified Diego Saurez Bay, or British Sound, near the north-eastern extremity of the island; Port Loquez, Antongil Bay, and the Bay of St Luce, on the eastern coast. Tamatave and Foule Pointe, though the most frequented ports on this side of the island, are only open roadsteads, protected by reefs of coral. St Augustine's Bay, a port of frequent resort for vessels trading to the N.W. coast, and ships engaged in the whale fishery, Tolia Bay, Boiana, Bambetoka, Majambo, Narcenda, Pasandava, and Chimpaykee Bays, are the most important on the western coast. There are several small islands adjacent to the northern shores of Madagascar, of which St Mary's, 31 miles long and 2 or 3 miles broad, on the eastern coast, and Nosibé, a somewhat larger and more compact island, on the N.W. coast, are the most important. Both these small islands are now occupied by the French, the latter having been taken possession of by them in 1840.

The physical aspect of the country is varied. The shores of the northern parts, and some portions of the south-eastern coast, are bold and precipitous,—the high land and mountain ranges extending to the sea; but in general the coast is low and flat for a distance varying from 10 to 50 miles on the eastern side of the island, and from 50 to 100 miles in some parts of the western coast. The low land is generally covered with luxuriant vegetation; and trees of large size and abundant foliage often extend to within a few yards of high-water mark. At varying distances from the coast the country rises gradually towards the interior, where the land is highest, being 6000 feet above the level of the sea. The ascent from the low lands along the coast to the high central regions consists, especially on the eastern side, of a succession of ranges of mountains, or hills, running in a direction parallel with the coast, and 500 or 600 feet high. The mountain ranges are occasionally separated by fertile plains of several miles in width, but more frequently by a narrow valley only, or a mountain stream. With one or two exceptions, the loftiest mountains of the island are in the interior, and rise from the most elevated portions of the central provinces. The highest of these is Ankaratra, a basaltic pile, on a range of gneiss or granite mountains, about 50 miles to the S. of the capital. Next to Ankaratra, Andringitra, to the N.W. of the capital, and Angavo, near the boundary, between Ankova and Ankay, about 60 miles to the eastward of the capital, together with Iangogora, near the northern extremity of the island, are reported as the highest mountains in Madagascar, and are computed to be between 8000 and 12,000 feet above the sea.

The valleys are numerous; some of them extensive, fertile, and remarkably beautiful. The soil is occasionally marshy and wet, but is in general the most prolific and extensively cultivated in the country. Belisa, in the country of the Sakalavas, to the S.W. of the capital; Ambolo, in the province of Anosy, to the S.E.; Angavo, situate in Ankay, between the lofty mountain of the same name and Ifady; and Betsimitatatra, to the W. of the capital, are among the most celebrated valleys in the island. They vary from 4 to 10 miles in breadth, and from 40 to 60 miles in length, and are generally populous, fertile, and extensively cultivated. Besides the valleys, there are extensive plains; one to the W. of the capital, being nearly 100 miles across. These are sometimes comparatively barren, but more frequently covered with thick coarse grass.

The country is well watered, even in the high and central regions. The rivers are numerous, and some of them large, winding their way, under different names, 150 or 200 miles from their sources to the sea. The mouths of the rivers are generally choked with sand, and though some of them on the N.W. coast are navigable for small craft for a considerable distance from the coast, they are

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but little used for purposes of inland navigation. The Sambaho and Betsibooka are said to be navigable for boats for the distance of 150 miles from the sea. The Ikiopa, Mansiatria, Matetanana, and Mangoro, are among the largest rivers in Madagascar; the greater part of them find an outlet on the western coast. Extensive lakes stretch along the eastern coast for nearly 200 miles, and at intervals communicate with the sea. Others exist in different parts of the island, and are celebrated for their extent or beauty; some of them being 100 miles long, and occasionally studded with islands, and surrounded by the most luxuriant vegetation. Some of them abound with fish, which are highly prized by the inhabitants residing on their borders. Saririaka (literally, image, or portrait of the ocean); Imania, in the Sakalava country; Imanangora, in the province of the Antsianaka; and Itasy, in Imerina, are among the most remarkable.

Fountains and springs are numerous and valuable, especially those situate in the more elevated provinces, where they are called by the people *rano-velona* (living waters). Besides these, mineral waters and medicinal springs, of great reputed virtue, are occasionally met with; and thermal or hot springs, some of unusually high temperature, are of frequent occurrence.

The geology of Madagascar has yet to be examined and described; and little is at present known respecting it, beyond the aspect of some of its more prominent features in the parts most accessible to Europeans. The successive ridges of mountains, or hills, between the eastern coast and the interior, seem to consist of primary rocks; gneiss, granite, quartz, sometimes of a beautiful pink colour, at others in large transparent masses, are frequently met with; basalt and large beds of clay are also to be seen. In the central and southern parts of the island slate formations and limestone, with imbedded fossils, have been found. Iron of excellent quality is plentiful near the surface of the ground in some of the central provinces, and is so abundant in one of the mountains—Ambohimiangavo—that it is called *Iron Mountain*. Coal has also been found on more than one spot in the northern parts of the island. No attempts have been made to ascertain the extent or quality of the coal; but iron has long been wrought by the natives into such implements of war, agriculture, or domestic use, as their grade of civilization required. Copper and other minerals are said to exist in the country; but all the copper that is seen in the possession of the natives seems to have been obtained from foreigners.

The climate is very unequal, both in relation to its salubrity and temperature. In the high northern and central districts it is salubrious, and many very aged people are to be met with among the inhabitants. In the northern regions showers of sleet often fall; and in the central districts the ground is occasionally covered with hoar frost, and ice is seen among the mountains during the winter season. The fluctuations of the temperature are often extreme; the thermometer ranging from 40° to 80° in the same day. The seasons of rain are periodical and regular. The climate of the low lands, and the vicinity of the coast throughout the whole islands, is exceedingly unhealthy. The heat during great part of the year is intense, the rain frequent, vegetation rank and luxuriant, and fevers of an intermittent and typhoid character severe, and very frequently fatal to Europeans and the natives of the more salubrious districts. The miasma is most virulent between the months of November and April, and during this time the natives of the interior avoid visiting the coast, and few trading vessels resort to the ports.

The central districts of the island are comparatively sterile, though some are covered with thick tall grass; but all the low land, the intervening regions, and some of the higher portions of the country, are clothed with verdure,

Immense forests, 40 or 50 miles in breadth, traverse, with occasional interruptions, parts of nearly all the provinces of the island. These forests abound with large and durable timber, suitable for carpentry and ship-building. Woods valuable for cabinet work, viz., a species of mahogany, and ebony, are also met with. But the botany of Madagascar, regarded from a scientific or economic point of view, presents a rich and extensive field as yet scarcely penetrated. Two botanists from Germany, who visited the island more than thirty years ago, mention that among 400 plants which they collected, 100 were new or undescribed species, and 200 new varieties. The plants already known are rare and valuable, and some of them peculiar to the island; among the latter may be mentioned the *Urania speciosa*, or traveller's tree, which not only furnishes to the traveller or the labourer, at all seasons, a cool, sweet, and wholesome beverage, but is also extensively employed in the structure of the native dwellings, as well as for a variety of domestic purposes; the *Sagrus rufia*, which provides clothing for so large a portion of the lower classes of the people; several species of cotton; the poisonous *Tangena*, which has been rendered so destructive of human life among the people; the splendid *Poinciana regia*, and the *Colvillea racemosa*, 40 or 50 feet high, and which, when covered every year, the one with scarlet, the other with yellow flowers, are among the most gorgeous and magnificent of vegetable productions. Also the curious and elegant lattice-leaved plant *Ouvirandra fenestralis*. Several kinds of spices are indigenous, as are also different species of indigo; plants yielding the gum-copal and gum-elastic, and numerous varieties of dye-woods, are also found. Honey and wax abound in the wooded parts of the island.

Among the plants used as food, rice is the most abundant and universal, though arrow-root is the principal article of food among the Sakalavas on the western coast. Besides these, there are yams, manioc, sweet potatoes, and sugar-cane. To these have been added millet, maize, and potatoes. Among the fruits, the cocoa-nut plantain, or banana, of which there are several species peculiar to the island, and of excellent quality; citrons, oranges, melons, mangoes, and peaches.

Domestic poultry are abundant; there are also several kinds of pheasants, and a small species of partridge. The guinea-fowl, both wild and tame, exists in considerable numbers. Turkeys, geese, and ducks, and a superior kind of domestic fowl, have been introduced, thrive well, and are exported in large numbers to Mauritius and the Isle of Bourbon. Water-fowl, in considerable abundance, are found among the lakes and marshy parts of the island. Pigeons and parrots inhabit the woods; and among the feathered tribes birds of the falcon genus are frequently seen. A kind of ostrich is said to resort to the most solitary parts of the island; and the existence of an immense bird in the island is proved by the gigantic fossil eggs which have been found near St Augustine's Bay, and are now in the museum at Paris.

Horned cattle, wild and tame, are the most abundant and important of the quadrupeds. The former, in immense herds, roam over the remote, unfrequented parts of the island, seldom disturbed by the hunters. Tame cattle, which are of the buffalo breed, are reared in great numbers as food and for exportation. Sheep in small numbers are fed in Imerina, and pigs in some of the districts. Wild hogs exist in the woods, together with wild dogs and cats, baboons, monkeys, racoons, lemurs, foxes, and squirrels, and the rare and singular animal the *Cheiromys Madagascariensis*, or Aye-aye, of which only one skeleton has yet reached Europe. Tame dogs are kept in the villages; but cats, being considered creatures of evil omen, are rarely seen, and rats and mice consequently swarm in all the habitable parts of the island. Scorpions are numerous, large, and venomous. Few of the serpents are poisonous, though many are unusually large, and are

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said to attack and destroy a quadruped. Crocodiles abound in the rivers and shallow waters, and often prove fatal to travellers and cattle when fording the streams. They are large and powerful reptiles, measuring 15 or 17, and sometimes even upwards of 20 feet in length. In the southern parts of the island they are said to be exceedingly fierce and dangerous, at times attacking and upsetting the frail canoes of the natives, and preying upon the voyagers; yet such is the superstitious feeling of the people towards the crocodile, that though they would seek protection from it by charms or prayers, they would not injure or attempt to kill one, even in self-defence.

Agriculture is but in its infancy. Rice is cultivated extensively, and the plantations wrought and irrigated with commendable industry and skill; other articles are only cultivated to a small extent, and as supplementary to the rice, which is the staple food of the inhabitants. The implement chiefly in use is a strong iron spade, with a long, straight handle. The labours of the field are chiefly performed by male and female slaves, and oxen are not used, either for tillage or as beasts of burden, excepting when they are driven over the fields to pulverize the soil; and the few horses which they possess are kept for riding.

Though the native manufactures are not numerous, they indicate no deficient capabilities in the people. They fabricate articles of jewellery in gold and silver with much taste and skill, and work well in iron and wood. Their matting, platted or woven by the hand, is not only large and strong, but some kinds fine and beautiful in quality and pattern. Their native stuffs, woven from the fibrous parts of the rufia leaves, and their lambas, or native dresses, in cotton and silk, though wrought in the simplest looms, are often beautiful and durable fabrics.

The commerce of the island, though at present but trifling, is capable of almost unlimited extension. The chief articles of export are—cattle, poultry, rice, rufia cloth, matting, a kind of grass hat, woven by hand, light and durable; gums, and bees' wax. Coffee would grow well in many parts of the island, indigo might be produced to almost any extent, and both might furnish valuable articles of export. Good sugar has been made, but at present the cane is only cultivated for purposes of food, or for distilling from its juice a strong, fiery sort of arrac, the use of which is extended among the people, especially at the ports, and threatens to produce the most disastrous consequences. Other articles of export might be produced in a country so fertile and extensive; and rice might, with but comparatively little additional labour, be raised in much larger quantities than it is produced at present. It is scarcely possible to conceive of a soil more adapted for the cultivation of rice than that of many parts of Madagascar, or more fertile than in favourable seasons it often proves; a single bushel of seed yielding, under their most skillful modes of culture, in a favourable season, one hundred bushels of grain. The crop, when ripe, is reaped, dried, and thrashed on the ground. Their process of thrashing consists in taking up large handfuls of rice and straw, and beating the ears on a stone or portion of rock fixed in the midst of a dry, hard, thrashing-floor, prepared for that purpose in some central spot easily accessible from the cultivated fields. When the grain is thrashed, it is carried on the heads of slaves to the granaries of their owners. These granaries vary in structure in different parts of the island. On the eastern coast and to the southward, the grain is stored in small houses raised on posts, with projecting ledges, to prevent the access of rats and mice. At the capital and some of the central provinces, the rice is preserved in granaries built of clay, in the form of a cone, with only one aperture on the summit. Some of these granaries are built above ground adjacent to the dwellings of their owners; others are constructed of the same form and dimensions under ground, the aperture

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at the top, generally about a foot below the surface, being covered with a stone, and then the hollow filled up with earth composing the surface of the court-yard, in which the underground granary is usually sunk. Rice by these means is often preserved for a great length of time in excellent condition. With land so fertile and adapted for the growth of such abundant crops of rice as the plantations in the interior often yield, it might be raised for exportation to almost any extent; but the absence of canals and public roads, and all means of land carriage, precludes the possibility of conveying the produce of many of the provinces to the seaports, excepting in comparatively small quantities, and thus impedes very materially the development of the resources of the island. The government has been deterred from constructing or encouraging the formation of public roads, from an apprehension of the facilities they would afford to a hostile force invading the country and seeking to penetrate the interior. The want of good roads, therefore, though detrimental to their commercial interests, is preferred by them as a means of security. This disadvantage might be, to a great extent, compensated in some of the provinces by greater attention to the means of carriage by water. The late Radama commenced the work of connecting some of the principal lakes on the eastern coast by means of a canal, but since his death the work has been discontinued. Boats, better adapted for conveying grain in larger quantities to the places adjacent to the ports, and accessible by water, might be constructed, and would assist in augmenting the exports from the island. Their imports are chiefly cotton and woollen goods, wearing apparel, articles of domestic use, fire-arms, ammunition, wines, and liquors; and to these other articles will doubtless be added as their means of purchasing them increase. The Hovas, the paramount race in the country, exhibit many of the elements of a thoroughly commercial people; keenness in trade seems to be intuitive with many, and the love of bartering almost a passion among all; scarcely any engagement interferes with the market, and multitudes employ themselves in hawking goods of foreign or domestic manufacture about the country for sale. In this occupation many persons of rank and property employ their slaves, giving them a percentage on the amount or the profit of their sales. The dealings of the Hovas are seldom transactions of barter or exchange, but usually money purchases. The only coins they use are Spanish dollars, and very recently five-franc French pieces. For all the cattle exported these silver coins alone are received in payment. The Malagasy have no native currency; and for ordinary use among themselves, the Spanish dollar is cut into halves, quarters, eighths, and smaller portions, even to the seventy-second part of a dollar. The cut pieces of the dollar are weighed in every instance, and a pair of money scales, with their appropriate iron weights, are not only considered essential in every house, but are often seen thrust into the girdles of the men when employed in their ordinary avocations. Money-changers are a distinct class among the traders, and the rate at which whole dollars and cut silver are exchanged fluctuates almost daily at the capital and other principal places, as the one or the other are most in demand. In other parts of the island, especially those remote from the capital or the ports visited by shipping, the trade among the inhabitants is carried on to a great extent by exchange, or barter. Several attempts have been made by the foreign traders to induce the natives to receive gold coin in payment for cattle and other articles, but hitherto without success. The Hovas are not ignorant of the relative value of gold and silver, but at present seem only to value the former for the manufacture of jewellery and other articles of personal ornament.

The government of the country was, until the reign of the late King Radama, exercised by a number of

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princes, or rulers, independent of each other. The personal will of each ruler was the supreme law, which all living under his authority were required to obey. This government was nevertheless, to a certain extent, representative, and embodied in its practical working a recognition of the will of the people. A number of the principal persons in each province or territory, governed by a single chief, were always associated with the supreme ruler in administering the government, which was maintained according to certain traditional usages recognised alike by all parties. Besides this, appeals were made on all great occasions to the people, who were summoned to public assemblies, called *kabarys*, when the wishes or requirements of the ruler were made known, and the people were required to express their opinions; and though the latter were generally expected to concur, without questioning, in the proposals that were made, they were thus recognised as parties concerned, and plans were sometimes modified in consequence of the proceedings at the public *kabarys*.

By the natives themselves Madagascar is divided politically into twenty-two provinces, and these provinces often comprise two or three smaller political or territorial subdivisions, as in the case of Ankova, the central province of the island, and the province of the Hovas, which includes Imerina, Imamo, and Vonizongo. Sometimes the province and its chief town, or village, are designated by the same name, as in Mahavelona and Tamatave, though the inhabitants of both these and the adjoining provinces are called Betsimesarakas. At other times the province and its inhabitants are called by the same name, as in Antsianaka and Betsileo. In other instances a large extent of country is called by one name and its inhabitants by another, as in the S.W. coast, where the country was called Menabe, the inhabitants, Sakalavas; and each large division of the island has its own local usages and laws.

The late King Radama succeeded during his reign, which terminated in 1828, in obtaining, by conquest or treaty, the subjection and adhesion of all the independent rulers in Madagascar, and thus became the acknowledged sovereign of the whole island. And although he allowed no authority or law above his own will, even this arbitrary and absolute rule, exercised as it was in carrying into effect his own enactments, and supported, moreover, by the military organizations introduced among the Hovas during his reign, was nevertheless administered with a large measure of regard to previously existing usages among the people. The system of government established by Radama has, with but slight alteration, been continued by his successor. The present government of Madagascar may therefore be regarded as a sort of combination of pure military despotism and limited monarchy; the former, though greatly preponderating, being modified by certain acknowledged requirements from the sovereign, and traditional and hereditary rights and usages on the part of the people. The sovereign of Madagascar claims nominally the right and authority to do whatever he pleases with the lives and property of his subjects; but traditions and customs have in a number of instances the force of law, which the sovereign deems it needful to respect; and to some extent the opinion of the people, as expressed through their subordinate and local authorities, is considered, and their will to a certain extent regarded. For though the power of the sovereign is nominally absolute, and he is lord of the soil, owner of all property, and master of all the people, and disobedience to his orders would be followed by confiscation of property, loss of liberty, and most likely of life, long-established usages seem to require the appearance at least of equity and justice in the proceedings of the ruler, and the exercise of this power conformably with acknowledged rights of the people. No sovereign would feel himself safe whose rule was condemned by the majority of his people; but a sove-

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reign whose rule was wise and just would be regarded with admiration and veneration, as a being almost more than human. On one occasion a sovereign of this character was apparently near his death, and the diviners said that a human sacrifice was required for the preservation of his life. When this was made known to the people, an individual came forward and offered to die for the preservation of his sovereign; his offer was accepted, though his life was ultimately spared.

The duties of the sovereign are onerous and varied. He is not only supreme ruler, ordering all affairs, enacting all laws, and superintending their execution; he is also supreme judge, and punishment of death can only be inflicted by his authority; he is likewise commander-in-chief of all the forces of the kingdom; and he is, moreover, chief priest, officiating personally in the religious rites at the national festivals. He has no officially appointed council, but may call to his assistance whomsoever he chooses, consult them unitedly or separately as he pleases, and follow their advice or his own as he deems preferable. Radama, it is said, was accustomed to consult his chief officers repeatedly in reference to any measures of policy which he was contemplating, and then decide according to his own judgment. The sovereignty is hereditary, as are also most of the offices of the government; yet both rank and office are acquired by merit. In both cases they are the gift of the sovereign, but grade in society descends hereditarily. Though the sovereignty is hereditary, the ruling sovereign has the right of nominating his successor, with such limitations and conditions as he may judge fit, and nothing less than armed insurrection would set aside such nomination, if officially or publicly announced to the people. The arming and training the troops of Madagascar according to the European manner, accomplished by Radama about thirty years ago, as well as the uniting of the whole island under one sovereignty, changed to a great extent the system of government, which is now, considering the partial civilization of the people, elaborately organized and highly centralized. The rank in the army is reckoned by numbers, commencing with the privates, whose rank is 1, and rising through all the intermediate grades in the service to that of the commander-in-chief, whose rank is 14, and is the highest beneath the sovereign. The same gradations of rank extend to all civil officers of the government, and impart a military character to the whole. The rank of any individual is derived from the sovereign, by whom it may be increased on account of merit, or reduced by way of fine or penalty for offence. In some of the provinces, hereditary rulers still exercise jurisdiction; but the governors of these are usually appointed by the sovereign, and are at the same time chief commanders of the military posts in the districts. The laws or edicts of the sovereign are proclaimed to the people in the capital, and the country immediately adjacent, by the sovereign in person, or by some of the supreme judges or other high officers. On these occasions the people are summoned to attend, and are generally expected to express their assent, or to propose any alterations they may desire. The laws and requirements of the sovereign are sent to the governors or chiefs of the provinces by regular messengers, and are promulgated publicly to the people, generally in the market-place; and it devolves on the heads of thousands and heads of hundreds to secure their due observance in their respective villages. There is also a sort of military police charged with maintaining order, preventing theft, arresting delinquents, &c.

Justice is administered by magistrates or judges appointed by the sovereign; the sittings of the judges are public, generally in the open air. The ordeal of the *tangena*, or drinking of poison-water, is very frequently resorted to in order to prove the innocence or guilt of the parties accused.

The revenue of the sovereign is limited as compared with

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the amount of property in the island, the riches of many of the nobles, as well as the numbers of persons in government employ. The want of a more ample revenue operates unfavourably upon the people, leading often to great oppression,—large supplies, viz., provision for the army, felling timber, quarrying stones, and all kinds of public work, are required to be furnished without any payment whatever. The people are not insensible to the advantages of good government, but would much prefer a better mode of sustaining it, as it is said that a tax, even to one-fourth of the produce of the land, would be less oppressive than the present system. The revenue of the sovereign is derived from spoil taken in war, chiefly cattle and slaves; donations of money on certain occasions, as acknowledgments of sovereignty; a tenth of all the produce of the country; a sort of poll-tax on all slaves; one-fifth of the profits of goods taken to the capital and sold, excepting in public market; and a duty of 10 per cent. on all foreign imports and exports; the first-fruits of harvest, an annual tax on each spade, as a sort of rental for the land cultivated, and a small tax on each house. In addition to these sources of revenue, a portion of all fines imposed by the judges, one-third of the price of all persons sold into slavery on account of debt, and the property of all who die in consequence of drinking the *tangena*, or poison-water, belongs to the sovereign. The court of the sovereign at the capital of the kingdom is maintained in considerable pomp, and with numerous attendants. The troops of the sovereign are estimated at 40,000 men, a considerable portion of whom are armed with muskets; and some idea of the number of government *employés*, and of the progress of education under the patronage of Radama, may be gathered from the fact that, while in the year 1818, when the first missionary arrived in the island, the king (Radama) employed only one writer, in 1836, when the missionaries left, no fewer than 4000 writers were employed by the queen's government.

The religious opinions of the Malagasy are exceedingly vague, indefinite, and crude, their mythology disjointed and fragmentary, and their acts of worship apparently unimpressive and infrequent. Their idols, or objects of superstitious regard, make scarcely any appeal to the senses or feelings, except to their fears; nevertheless, they cling tenaciously to the creed or belief which has been handed down from their ancestors, and surrender themselves unscrupulously to its influence. They are not destitute of ideas respecting a supreme, invisible, and mighty spiritual being, whom they call God; yet it is exceedingly difficult to arrive at the exact ideas which they associate with the word, as it is used for objects utterly incompatible with each other. Their religion seems to consist in a belief in the power of the spirits of their ancestors; hence, the spirits of the ancestors of the reigning family are regarded as among the chief objects of national worship and trust. Other objects of worship seem rather to be charms than idols. Their belief in charms of various kinds is universal, as is also their belief in witchcraft, sorcery, and divination, and likewise in a species of fatalism, or stern, inevitable, immutable destiny. They have no temples, or altars, or priesthood; their visible objects of worship are kept in houses considered sacred, and prohibited, except to certain persons appointed as their keepers. Offerings, or presents, are made to those having the custody of the idols, and requests are preferred; but they are generally brief ejaculations, deprecating anger, and imploring wealth or some other temporal good. Most of their calamities are ascribed to sorcery, or the agency of invisible and malignant beings, against whom charms alone afford protection; and almost every transaction of life, and often even life itself, is dependent on divination; as in the event of birth on days esteemed lucky, or the reverse, in which case it depends on the diviner of the

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infant's destiny whether or not it is to be permitted to live. Their ordeals are exceedingly sanguinary, delusive, and cruel, and their religion has in no degree tended to enlighten the understanding, or improve the character of its adherents; while it has, so far as it has operated, retarded their civilization. Their ideas of a future state are as dark and unsatisfactory as their religion during their present life; not that they are destitute of all belief of a future life, but it is uncertain, unsatisfactory, and unwelcome, and death at times as alarming as irresistible. The ceremonies connected with death and interment are numerous and costly; and the tombs of their chiefs (piles of stones of large dimensions) are among the most striking and impressive of their antiquities.

It has been said, that at one time the Arabic language was understood and written by a few individuals, probably of Arabic descent, residing on the south-eastern coast; but previously to the year 1820 education and letters were unknown in Madagascar; neither had they any hieroglyphic or picture writing, or any of the ruder methods of recording events which have prevailed among some nations in the early periods of their history. At the time above mentioned, the English missionaries of the London Missionary Society commenced their labours at the capital, under the auspices of the king, and with all the assistance he was able to afford them. They formed an alphabet, and fixed the orthography for the language, adopting the common European characters to express the native sounds; subsequently they prepared grammars and vocabularies of the language, printed elementary books, and finally translated the Bible into the Malagasy language. Their efforts to teach reading and writing were at first attended with great difficulties, on account of the great aversion of the people to all innovation in their established usages, and from an apprehension of the liberty and safety of their children, as few foreigners, excepting slave-traders, had visited the capital. These difficulties were, however, at length overcome; and during the reign of Radama the schools were not only increased in the capital, but extended to the provinces, and it is estimated that 10,000 or 15,000 scholars were educated. After the death of Radama, the enlightened patron of education among his people, schools and teaching were discouraged, and in a few years entirely prohibited throughout the island. But so self-evident were the advantages and enjoyments of education, and such the earnest desire of those who already possessed them to perpetuate it, that although no public means of education existed, it seems to have been considered as a part of parental duty to educate the children, especially the boys in each family. The degree of proficiency attained by the men and boys belonging to the families of those who had been originally taught in the schools of the mission, shows that great attention and time must have been devoted to their instruction; and although the present government (1857) is not favourable to education, the Hovas, the only portion of the inhabitants among whom it has ever prevailed, seem determined that it shall not be lost, while multitudes of the young are eager for instruction and books. A number of them are very imperfectly acquainted with English; and had the schools continued, many would before this have acquired a degree of proficiency which would have placed within their reach the rich treasures which that language contains. As it is, considering the prohibition of public schools by the government, the amount of education among the Hovas is remarkable. All books treating on the subject of religion being prohibited, and even their possession subjecting to very severe penalties, while few were prepared by the missionaries in which religion was omitted, the people may be said to be almost destitute of books; still, so far as the Hovas are concerned, they are not an uneducated people. The entire Bible, a translation of Bunyan's *Pilgrim's Progress*, and a number of other books of a Christian and educational character exist

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in the Malagasy language, together with grammars and dictionaries prepared by the missionaries during their residence upon the island.

The early history of Madagascar is necessarily involved in great obscurity on account of the absence of all records among the people themselves. The name of the island is unknown among the natives, and is only adopted by them as the term by which foreigners designated their country. It was called *Scrandah* by the Moors and Arabs, by whom it was visited for the purposes of trade long before it was discovered by Europeans. The inhabitants of Europe were made acquainted with its existence at the close of the thirteenth century by the publication of the travels of Marco Polo; and it is said to have been discovered by Europeans in the year 1506. By the Portuguese it was called the Island of St Lawrence, probably in honour of the saint on whose day in the calendar it was discovered. The Portuguese formed a settlement on the coast in 1508. By the French, during the reign of Henri IV., it was called *Isle Dauphine*. By Marco Polo it was designated *Magaster*; and by the English it seems always to have been called by the name it now bears. The colony settled by the Portuguese was destroyed by the French, who subsequently formed their first settlement in the island in 1642, by virtue of a patent from Cardinal Richelieu to a Captain Rivault, who, associated with others, formed the French East India Company. It is stated by Flaucourt that at that time the English had a settlement of 200 men at St Augustine's Bay; and it is certain that considerable efforts were in progress for colonizing in Madagascar during the early part of the reign of Charles I., but in the troubles of subsequent periods it appears to have been lost sight of. The French formed settlements at different times, which continued for unequal periods during 100 years, but the last was abandoned about 1740. In the beginning of the present century, and during the administration of General Decaen, the last French governor of Mauritius, French agents were sent to Tamatave and Foulé Pointe to protect the French traders, and facilitate commercial intercourse with the people, who were then regarded as proprietors of the country. These factories, or establishments for the protection of trade, continued till the capture of Mauritius and its dependencies by the English in 1810. On the 17th of February 1811, a British frigate proceeded to Madagascar, and M. Sylvan Roux, the French commander at Tamatave, surrendered to the officers sent down, and the places were occupied by British troops. A settlement was afterwards commenced by the English at Port Loquez, in the north, and a tract of land purchased from the chiefs. But about this time the British government made proposals to Radama, the sovereign of the Hovas, and the most powerful ruler in the island, to abolish the trade in slaves from Madagascar. In 1818 this object was secured by a treaty, and by this treaty the English ceded to Radama all claim to any part of Madagascar derived from the French by conquest, or obtained from the natives by purchase; and Madagascar was declared to be an independent country. The French subsequently claimed certain portions of the eastern coast; but Radama refused to allow their claim, affirming that he alone was sovereign of Madagascar, and they were strangers and foreigners. In 1829 an expedition under M. Gourbeyre was sent, consisting, it is said, of 1500 troops, to take possession of some parts of the coast; and though they succeeded in destroying the village and fort at Tamatave, burning the habitations and killing vast numbers of the people, the resistance they met with at Foulé Pointe obliged them to embark with loss, and finally sail from the coast. No attempt has since been made by the French to obtain possession by force of any portion of the Island of Madagascar; the attack on Tamatave in 1846 being caused altogether by the dif-

ferences between the native rulers and the resident foreign traders.

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The reign of Radama, which commenced in 1810, and terminated by his death in 1828, at the early age of thirty-six, was the most important and eventful period in the history of Madagascar. The treaty with England not only secured the abolition of the slave trade, which had become a source of great misery and injury to the people, but was associated with more intimate and friendly relations with that country than had ever existed between the people and any civilized nation; it was followed by the introduction of more honourable commerce and various productions of civilized countries, besides the introduction of European arms and tactics. This last, by rendering other powers subject to the sovereign of the Hovas, united the whole population under one government. A number of youths were sent to Mauritius, and others to England, for education and instruction in the arts of civilized life; and European artisans, sent out by the Missionary Society, introduced several of the most useful handicrafts among the people. Education commenced, and its benefits were widely extended. The power of superstition, so unfavourable to the advancement of the people, was undermined, and its influence, by the shrewdness and address of the sovereign, greatly impaired. Besides the introduction of letters and the useful arts, the missionaries had instructed the people in the Christian religion, and not only was the knowledge of the chief distinguishing truths of Christianity very generally diffused among the inhabitants of the central province, where the missionaries resided, but some few of the people appeared to have adopted in sincerity the faith of their teachers. But on the death of Radama, and the assassination of a number of his friends, including the young Christian prince whom he had nominated as his successor, the party who raised the present queen to supreme power, and administered the government of the kingdom, pursued a course directly opposed to the policy of Radama. Intercourse with Europeans was restricted and avoided, all the innovations of Radama were disapproved, and every effort made to revive ancient usages and the former superstitions of the country. The idols and their keepers were restored to the power and influence they had originally exercised; and it seemed to be the object of the authorities to restore the country to the state in which it was prior to the arrival and instructions of the Europeans, except in regard to the slave trade, which was still forbidden, and the military organization of the forces after the European manner, which was still continued. The benefits of commerce with Europeans were also so obvious and abundant, that efforts were made to preserve and increase them; but beyond this they seemed unwilling to extend their connection with foreigners. Commercial intercourse was, in consequence of the attack of the French and English on Tamatave in 1846, discontinued for several years, and though restored in 1853, the existing authorities have not evinced any desire for more intimate or extended intercourse with Europeans.

The revival of the influence of the ancient superstitions of the country, and other motives, led to the prohibition of religious teaching, and threatened with the severest penalty the profession of the Christian faith, and the practice of any part of Christian worship by any native in Madagascar. The missionaries left the island in 1836; and after this the authorities appear to have determined to use every means in their power to prevent the continuance of Christianity among the people, and a system of persecution, as severe as any through which the disciples of Christ have passed in former ages, was commenced in Madagascar. Multitudes have been sentenced to fines and confiscation, loss of rank and hard labour; others have been sold into irredeemable slavery, or imprisoned in fetters. Some have

Maddaloni died in chains from starvation; others from drinking the poison-water; others have been put to death by spearing or hanging. Some have been burnt alive; others have been thrown from steep rocky precipices, and their mangled remains left a prey for the dogs. Numbers have thus honoured the Christian faith by the blameless consistency of their lives, and the heroic constancy and holy fortitude of their deaths. Christianity, nurtured by the teachings of the few portions of the Bible still existing among them, continues. It is said that the young prince, the queen's only child, and heir-apparent to the throne, is himself a Christian, and has fully and publicly identified himself with the Christians, and afforded them all the protection and encouragement which his rank and influence affords. Though the laws against Christianity are not repealed, there is no active persecution, and none have for several years past been put to death on account of their religion. (w.e.)

MADDALONI, a town of South Italy, kingdom of Naples, and province of Terra-di-Lavoro, 14 miles N.N.E. of Naples. It has several churches and convents, an hospital, and a royal college. It has also some manufactures, and carries on a considerable trade in the products of the vicinity. The noble aqueduct which conveys water to the royal palace of Caserta is conspicuous here. Pop. 12,500.

MADDER. See **DYEING**, c. iv. § 1.

MADEIRAS, ~~THE~~, a group of islands in the North Atlantic Ocean, consisting of two inhabited islands, named Madeira and Porto Santo, and three uninhabited barren rocks, named collectively the Desertas. Funchal, the capital of Madeira, is in N. Lat. 32. 37. 45., and W. Long. 16. 55. 20.

Madeira, the largest of the group, has a length of 30 geographical miles, an extreme breadth of 12 miles, and a coast line of about 72 miles, leaving out of view the indentations, which are not great. Its longer axis lies E. and W.; and it is traversed in the same direction by a mountain chain, having a mean altitude of 4000 feet, and forming the backbone of the island, up to which deep ravines penetrate from both coasts. Pico Ruiwo, the highest summit, stands in the centre of the island, and has a height of 6100 feet. Several of the adjacent summits are very little lower than this. The greatest part of the interior is uninhabited; for the towns, villages, and scattered huts, either lie near the mouths of ravines, or upon the lower slopes that stretch from the mountains towards the coast. The ridges between the ravines terminate in lofty headlands; and nearly the whole coast is bound by precipices of dark basalt or crumbling tufa. On the S. side of the island there is left hardly any of the indigenous wood which once clothed the whole island, and gave it the name it bears; but on the N., some of the valleys are still filled with native trees of fine growth. The eastern extremity is terminated by a long, narrow, and comparatively low promontory of rock, named Point São Lourenço. Here there is a quantity of calcareous sand, with land shells of an extinct species, and calcareous infiltrations simulating the roots and branches of trees. After Funchal, the capital, the principal places of the island are,—Santa Cruz, Machico, Cama de Lobos, Ribeira Brava, Ponta de Sol, Magdalena, and Calheta, on the S. coast; San Vicente, Ponta Delgada, San Jorge, Santa Anna, Fayal, and Porto da Cruz, on the N. coast. All these towns and villages are at the mouths of ravines, except Santa Anna, which is a parish scattered over ground elevated at least 1000 feet above the sea. The N. coast is bound by a loftier wall of rock, and has altogether a wilder aspect than the S. The roads, in a country with a surface so broken as Madeira, must necessarily be bad, and hence, in transporting articles of bulk or weight, the people make use as far as possible of the sea. A great improvement has taken place within the last two or three years in the roads of the interior; but incessant

repairs are required to keep them passable—the heavy rains of winter being very destructive. Those near Funchal are well paved with small pieces of broken basalt. Madeiras.

It has been conjectured, but on insufficient evidence, that the Phœnicians discovered Madeira at a very early period. Pliny tells us of King Juba's geographical investigations, and mentions certain Purple, or Mauritanian Islands, the position of which, with reference to the Fortunate Islands, or the Canaries, might seem to indicate the Madeiras. There is a romantic story, which every historian of the island feels bound to mention, even while he discredits it, to the effect that two lovers, Robert Machim and Anna d'Arfet, fleeing from England to France in 1346, were driven out of their course by a violent storm, and cast on the coast of Madeira at the place subsequently named Machico, in memory of one of them. In 1419 two of the captains of Prince Henry of Portugal were driven by a storm to the island called by them Porto Santo, or Holy Port, in gratitude for their rescue from shipwreck. The next year an expedition was sent out to colonize the island, and Madeira being described, they made for it, and took possession on behalf of the Portuguese crown. Funchal was made a city in 1508, the seat of a bishop in 1514, and of an archbishop in 1539. When the archbishopric of Goa was created in 1547, the chief ecclesiastical dignity of the island was reduced to a bishopric. For the sixty years intervening between 1580 and 1640, Madeira, with Portugal itself, was under Spanish rule. In 1801 British troops arrived to garrison the island, as an attack on the part of France was expected, but they remained only a few months. In 1807 a large body of British troops, commanded by General Beresford, was again landed, and the island continued under the British flag until the peace of 1814. A few years since, Madeira ceased to be a Portuguese colony, being made a province and an integral part of the kingdom, entitled to send deputies to the Cortes assembling at Lisbon.

The inhabitants are of Portuguese descent, with some intermixture of Moorish and Negro blood. The men are of middle stature, well formed, with black hair and eyes. Those of the lower classes are strong, capable of long-continued labour, and industrious as long as they are under the pressure of want, which is but too generally the case. They are sociable and light-hearted, respectful in their behaviour towards their superiors, and polite towards each other. The women, in spite of their fine hair and eyes, are generally plain. The morals of all classes are not very strict, the priests frequently setting a bad example to the community. At the commencement of 1854 there were 991 foundlings in the different places provided for their reception in Madeira. The dress of the peasantry, without being picturesque, is peculiar. Both men and women wear on their heads the *carapuça*, a small cap made of blue cloth, in shape something like a funnel, with the pipe standing upwards. The men have trousers of linen, drawn tight, and terminating at the knees; a coarse shirt enveloping the upper part of their person, covered by a short linen jacket, or, in the town, by a jacket of blue cloth, completes their attire, with the exception of a pair of rough yellow boots. The women's outer garments consist of a gaudily printed calico gown, with a small cape of coarse scarlet or blue woollen cloth. The natives are fond of music, but they possess little skill in singing or playing, except as regards one instrument, the *machete*, a small kind of guitar, struck by the fingers. The mass of the people is entirely uneducated; and even the higher classes, though usually speaking English or French, seem to have little taste for reading or mental improvement. They are indolent, in spite of the fact that they are becoming poorer day by day. The principal business is carried on by British merchants, in whose hands the chief part of the wine trade has been vested. The British consul receives a salary of £300, and is allowed to

Madeiras. engage in trade. The inhabitants of Madeira amounted in 1855 to 102,837 persons. The population has been gradually decreasing for some years, and this decrease may be in part attributed to the stream of emigration which has of late years set in to the British settlements in South America, and in part to the severe pressure which followed the failure of the grape crop. Notwithstanding that, in the ten years ending with 1855, nearly 35,000 persons left the island as emigrants, there is reason to believe that it is still much too densely populated, looking to the small proportion which the cultivable ground bears to the whole, and to the general want of capital.

**Govern-
ment, civil
divisions,
&c.**

The administration of affairs is in the hands of a civil governor appointed by the crown. At the present time (1856) the same person holds this office and that of military commandant. The defence of the island is intrusted to a battalion of infantry of the line, a detachment of artillery, and a militia of nominally 1200 men. The forts along the shore are neglected and falling to ruin. The law of Portugal is administered by two chief judges appointed by the crown, each of whom has a separate division of the island under his jurisdiction, within which he tries both civil and criminal cases, with the assistance of a jury. Minor cases are taken before magistrates elected by the people. For municipal purposes, the island is divided into nine districts, called *concelhos*, each of which has its municipal chamber (the members of which are chosen by the people), whose duty it is to keep the roads properly repaired, cleansed, lighted, &c. The chief police magistrate of each *concelho*, styled *administrador*, is appointed by government. A bishop, with a yearly income of L.533, is at the head of the clergy, his cathedral being at Funchal. There are 49 parishes, each of which has its church and resident priest. Roman Catholicism is the established form of religion, but other religions are tolerated, except as regards the natives. The island sends four representatives (*deputados*) to the Cortes at Lisbon. They are elected by such of the male inhabitants as possess an annual income of 100 dollars. In 1854 the number of children of both sexes receiving instruction at elementary schools supported by private funds was 197; those of both sexes at the public primary schools supported by the municipalities and by government amounted to 2055, and those at private schools of this class numbered 337. At the Lyceum of Funchal, an establishment falling into the class of secondary schools, there are six professors, who are paid by government. In 1854 the pupils at the Lyceum were 121 in number. The total sum expended by the government on schools of all classes in 1854 was about L.1230. This sum covered the salaries of four professors of medicine and surgery attached to the hospital at Funchal, and the cost of the priests' seminario. By law, all children of a certain age should be sent to school, but this regulation is not enforced, so that probably not more than an eighth part of them are actually receiving education.

Trade.

The manufactures of Madeira are insignificant, their chief object being to satisfy some of the simple wants of the poorer classes. Baskets, straw hats, coarse linen and woollen articles, and shoes, are the principal objects. Artificial feathers, flowers, and sweetmeats are made for sale by the nuns. A good deal of needlework embroidery has been executed of late years by the women of Funchal for exportation, and a few fancy articles are made of the fibre of the *Agave Americana*. The bulk of the labouring population is employed in agricultural pursuits. Wine has hitherto been the chief article of export, but this branch of trade will soon cease. The rearing of the cochineal insect has been lately undertaken, in the hopes of its supplying the loss of the grape. Many of the coopers employed during the existence of the wine trade have emigrated; the rest earn a precarious subsistence. The casks they made possessed repute for excellence of construction. The chief

artisans of Funchal at present are boot and shoe makers, cabinetmakers, carpenters, and stone-masons. The number of merchant ships anchoring at Funchal (which is the only foreign port) during 1855 was 242, of which 121 were British, and 91 Portuguese. The chief imports are,—manufactured goods, iron ware, grain, salt, and timber. In 1855, of grain there was imported 195,765 bushels, principally from the neighbouring coast of Africa, and from the Azores. In the same year 27,800 bushels of salt entered. The official returns of the imports of manufactured goods cannot be relied on. The total receipts of the custom-house in 1855 amounted to rather more than L.17,000. There is no bank on the island; the gold and silver coin in circulation is not Portuguese, but British, American, and Spanish. Accounts are made out in *reis*, imaginary coins, 4800 of which are equal by law to the pound sterling. Spanish and American dollars are current, at the value of 1000 reis, or 4s. 2d. British money. Funchal is a coaling station for the British mail steamers from England to Brazil and the African coast, which touch here once a month on their outward voyages, and again on their return. The Portuguese and French steamers to Brazil likewise touch here. Besides these vessels, two English sailing packets are continually plying between London and Madeira, and a Portuguese packet brig to and from Lisbon.

The system of agriculture in Madeira is of a very primitive description, the implements of every kind being extremely rude, and the ignorance of all principles complete. Probably not more than one-half of the island is cultivated. The want of water keeps large tracts in their original state, and a very large part of the remainder is of such a nature as to defy cultivation. An incalculable amount of labour has been expended upon the soil of Madeira: First in the erection of walls, that have been built with the view of preventing the soil being washed from the slopes into the sea by the heavy rains of winter. In this way a great part of the lower and cultivated region is supported, the inclosures being built up one above another in the form of terraces. Secondly, the *levadas*, or water-courses, have cost vast toil. These works are either of masonry, or cut through the solid rock, and the water is thus brought by long winding channels from points high up in the mountains to the region of cultivation, where it is distributed by subordinate channels to the different inclosures, in regular order, according to the rights of their owners. In the absence of irrigation, the island for half the year would be a bare rock. Water in this climate has its value as well as the soil, and the one is made the subject of bargain, and sells just as much as the other. The springs, as might be supposed, are more numerous and copious on the north side of the great central chain of hills than on the south, whilst the demand for water is more urgent on the south than on the north. Attempts have consequently from time to time been made to convey the water by tunnels from one side to the other, but the skill of the engineers has frequently been inadequate to the difficulties, for the bottom of the completed tunnel has been more than once found to slope in the wrong direction. Could the whole of the south side be properly irrigated, the produce of the island would be wonderfully increased. A very large proportion of the land, perhaps as much as four-fifths, is strictly entailed. The removal of this restriction on the sale of land has been frequently agitated, but hitherto without avail. The relations of landlord and tenant are founded upon the old Roman, or what is now known as the *metayer* system. Money rents are unknown; but the gross produce of the land, after deducting the tithe, is equally divided between the owner and the occupier. It is the latter who is at the expense of all improvements, and these are his absolute property, which he can sell to another, without the consent of the landlord, whenever he pleases, and which, if not otherwise dealt with, will descend to his heirs.

Madeiras.

Madeiras.

The landlord, however, has always the right of getting rid of this incumbrance on his estate by paying his tenant the value of the improvements; but as he is usually without capital, this is very seldom done. Hence, the occupier of the land acquires a nearly perfect fixity of tenure. According to the mode of valuation adopted in such cases, the tenant's share of the land may be estimated to be worth at least as much as the landlord's. The tenements are usually very small; and what we call fields are very rarely seen. The cattle are all stall-fed when they are not feeding on the mountains. Horses are never employed for draught, all the labour of that kind being effected by oxen, of which there is an abundant supply. These animals are small, but strong and hardy. Mules and asses are a good deal employed to convey burdens on their backs. Up to the year 1852, the vine, which was introduced soon after the discovery of the island, yielded the chief produce—that which has given Madeira a name all over the world. In that year disease first manifested itself; it stopped the production of wine, and is gradually destroying the plant. The pressure was at first great upon all classes; but liberal subscriptions from abroad in some degree mitigated the distress. Nevertheless, many persons died from sheer want during the first eighteen months, and a large number were induced to leave the island for the British West Indies or South America. The lower classes have now got past the worst; indeed, they are better off now than they were for several years previous to the appearance of the grape disease. The income of the landlords, however, has not increased with the increasing prosperity of the tenants, and many of them have suffered a loss of at least one-half their revenue. The trade of a wine merchant will soon be extinct; for though large stocks had accumulated, owing to the gradually diminishing demand, the continued drain, in the absence of fresh supplies, will exhaust them in a year or two. Taking the average of the ten years ending with 1855, the annual export was about 5000 pipes, each pipe containing 92 imperial gallons. The cultivators of the soil have covered large tracts with sugar-cane, which here succeeds pretty well, though it does not attain the luxuriance of that in the West Indies. The juice is not converted into sugar, but is distilled into a kind of rum, the whole of which is drunk by the lower classes on the island. The cultivation of grain has considerably increased of late years, and the island now produces a much greater proportion of what is required for consumption than formerly. In 1854 the harvest is supposed to have yielded 113,250 bushels of grain, whilst the importations amounted to 216,290 bushels. Several of the merchants are turning their attention to cochineal, which has succeeded well in the Canaries and in Algeria. The vegetables principally cultivated are, —potatoes, sweet potatoes, pumpkins, beans, French beans, onions, cabbages, and the *Arum Colocasia*; the grain chiefly consists of maize, wheat, and barley. A little arrow-root is made. The coffee tree succeeds well in low damp situations, and the produce commands a higher price on the island than Brazilian coffee. The commonest fruits are,—the orange, peach, guava, fig, custard-apple, granadilla, and banana. Apples, pears, cherries, walnuts, and mulberries, succeed better on the hills than near the shore. Various tropical plants have been introduced of late years, such as the mango and pine-apple. There are large chestnut woods at a height of between 2000 and 3000 feet, producing great quantities of fruit, which forms an appreciable item in the sustenance of the people.

Funchal.

Funchal, styled a city, is the chief town of Madeira, and the capital of the archipelago. It is distant about 1164 miles from the Lizard Point in England, and 380 from the coast of Africa. It has a population, including the neighbouring rural parishes, of nearly 29,000 persons, equal to almost one-third of the total population of the island, but probably not many more than half that number live in the

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town itself. It stands on the shore of a shallow bay on the S. coast, backed by an amphitheatre of mountains. In this position it is seen to great advantage. Numerous country-houses, with their gardens, on the neighbouring slopes, give an air of great cheerfulness to a rugged landscape. The height of the mountains immediately behind may be estimated at 4000 feet. The bay is commanded by the cannon of a small fort placed on an insulated rock near the shore, and those of a fort upon an elevation behind the town. There are no facilities for landing either passengers or goods. The anchorage is tolerably good, and vessels in the bay are safe from all winds, except that from the S. When this blows strong, they are obliged to slip their cable and take to the open sea. The chief edifices are,—the churches, none of which deserve much notice, the governor's castle, and the custom-house, a spacious substantial building. The streets are narrow and irregular, but very clean; at night they are lighted with oil lamps. The city contains three public walks planted with trees, some fountains of excellent water, a large poor-house, flat-roofed, a large hospital, and a jail. The dowager Empress of Brazil is now building an hospital for the reception of 24 consumptive patients of Portuguese or Brazilian birth. Interments have ceased to be made in the churches, and now take place in appropriate cemeteries near the town. The houses are usually furnished with an iron balcony at the windows; and the larger houses have a tall turret. The entrances of some of the great houses are striking, from the spacious paved court, or hall, into which the principal staircases descend. The ground storey is usually set apart for shops, stores, &c., and the windows are defended with stout iron bars, giving a prison-like air to the streets. The shop windows, as in Lisbon, present none of the tempting display of those in an English town. Three small streams traverse the town on their way to the sea, and the deep channels along which they run are crossed by bridges. In summer the streams are nearly dried up. Occasionally during winter the waters are swollen by violent rain on the mountains, and a vast quantity of rubbish is brought down, which chokes up the channel, and compels the water to overflow its banks. In this way much damage has been done in a few hours to the houses in the neighbourhood. A very disastrous inundation occurred during the night, in October 1803, after a hot and dry summer. Great damage was done to property, several houses and a church were swept away, and between 300 and 400 persons lost their lives. In October 1842 another flood occasioned immense damage, but no lives were lost. In December 1855 one of the rivers was blocked up by stones brought down from the hills, and the stream rushed into the adjacent houses on each side. A former governor laid the foundation of a museum of natural history, geology, &c.; and the Camara of Funchal has a small collection of books accessible to the public. The Portuguese Club has a large house, containing ball-rooms and a billiard-table, but no library. The room of the Commercial Association is supplied with newspapers. The affairs of the city are managed by the Camara Municipal, a body of persons somewhat like one of our municipal corporations, the chairman of which is named a president. Their income arises from a share of the duty on grain imported, an impost on salt, fresh meat sold in open market, fish taken, and wine, and on licenses for the opening of shops. They expended in 1854–5 about L.3900, principally in lighting and repairing the streets. The leper's hospital, with its 30 inmates, costs them L.290: their schools about L.400. The markets are well supplied with vegetables, but they are not of the first quality. Flesh meat is cheap, and tolerably good, with the exception of the mutton. Fish is abundant and cheap, when fishing is possible, and forms an important item in the sustentation of the islanders. No wheel-carriages are in use; all cartage being effected either on the backs of mules

Madairas. and asses, or by means of a rude sledge drawn by bullocks. A low, covered car, mounted upon a sledge, and drawn by oxen, is generally used in place of the omnibuses and cabs of our cities. The only other means of locomotion are by horses, palanquins, and hammocks. The hammock is a kind of chair suspended from a pole, each extremity of which is borne on a man's shoulder. The second resembles a ship's hammock, and is likewise suspended from a pole. This affords an easy mode of progression on a long journey. The common people are accustomed to carry heavy burdens on the head and shoulders, and resolutely refuse to make use of such innovations as wheel-barrows and trucks.

The only bookseller's shop in Madeira is kept by an Englishman for the benefit of his countrymen. Some of the Portuguese shopkeepers have a few books on their shelves, but they are chiefly almanacs, or works of Roman Catholic devotion. Four newspapers are published weekly in Funchal, the circulation of which is very small.

Attracted thither by the wine trade, many British merchants have taken up their residence at Funchal. The British resident population of Madeira amounted in 1856 to 75 families and 290 persons. They have built a church and constructed a cemetery. It has its shopkeepers, physicians, and a chaplain, who receives £400 a-year, partly from the residents, and partly from the British government. There are two places of worship where the forms of the English Established Church are used, and the Scotch Presbyterians have likewise a place of religious meeting. Visitors to the number of about 300 annually betake themselves to Funchal during the winter and spring, the major part of whom are persons afflicted with pulmonary disease. The town is entirely protected from the north wind; and though the climate is rather damp, the temperature is remarkably equable. The air is free from dust and smoke; and the trying winds of spring, so prevalent on the continent of Europe, are not felt here. The hotels and boarding-houses are numerous and well conducted, being chiefly in the hands of English persons. Invalids may obtain in most of these very comfortable accommodation. Furnished houses, with gardens, in the immediate neighbourhood of the town, can also be obtained. Good drugs are dispensed by the apothecaries; and most of the articles a temporary sojourner is likely to require may be purchased at the shops. At the English Club there is a billiard-table and a library of 2300 volumes. Such is the number of British assembled every winter in a small space, that a stranger will probably feel his separation from home less here than anywhere else out of England.¹

Climate.

Situate in the temperate zone, about ten degrees N. of the tropics, and surrounded by the ocean, Madeira enjoys a climate of singular mildness; for not only is the winter warm, but the summer is cool. The mean annual temperature of Funchal is about 66° F. In winter the thermometer has never been known to fall lower than 46°·5, and indeed it very seldom touches 48°; whilst the temperature in the summer rarely rises higher than 80° near the shore. The mean temperature of the seasons is nearly the following,—spring, 66°; summer, 70°·5; autumn, 67°·5; winter, 61°. The mean daily range is about 10°. The number of days in the year on which rain has been observed to fall varies from 66 (1850) to 113 (1852); but 88 may be considered the mean. The annual quantity of rain likewise varies considerably; in 1825 as little as 20·43 inches fell, in 1826 as much as 43·35 inches; but 30 inches may be considered the average fall, and of this quantity nearly $\frac{2}{3}$ ths fall in winter, $\frac{1}{3}$ th in autumn, and $\frac{1}{6}$ th in spring. A heavy and prolonged descent of rain usually occurs in September or October, after which the weather clears up until Janu-

ary. Rain continues to fall, at more or less distant intervals, until June, after which come months of settled weather, almost unbroken by a shower. The rain is often very irregularly distributed through the colder months. At the commencement of the rainy weather, and sometimes in the course of the winter, the rain falls with almost tropical violence. Observations with the wet and dry bulb thermometer four times daily through the first four months of 1852 and 1853, gave, as a mean result, 73 per cent. of the vapour required for the saturation of the atmosphere. Observations taken eight times daily in the seven months from November 1854 to May 1855, yielded results that showed the air held 71·6 per cent. of the vapour necessary for saturation. It must be remembered that Madeira is a small island in a warm latitude, and that the air must consequently contain a considerable quantity of aqueous vapour from the proximity of the sea. The prevalent winds are those that blow from the N., or from a point or two E. or W. of N. The W. wind, coming across a great expanse of ocean, brings rain; that from the E., coming from Africa, is a dry wind. The *leste* of the inhabitants is a hot and dry E.S.E. wind, which visits Madeira for a few days each year, usually in the summer. It has been compared to the *scirocco* of southern Europe, but it has few of the disagreeable effects of that wind; and some persons even feel an unusual exhilaration of spirits during its continuance. The mountain-tops are then hotter than the lower regions, but even there the thermometer sometimes indicates 98°; and, at a much lower temperature than this, furniture, books, &c., show the extreme dryness of the air by bending or cracking. As the thermometer never approaches the freezing point by several degrees, frost and snow are wholly unknown in Funchal; but snow falls on the mountains at least once during the winter, not lower, however, than 2500 feet above the level of the sea; and hail sometimes makes its appearance in the storms of wind which occasionally burst over Funchal. A series of daily barometrical observations, made at ten A.M. for six years, at a locality 89 feet above the sea, gave 30 inches as the mean annual reading. Sir James Clark, speaking of the climate of Madeira with reference to its effects on pulmonary disease, makes the following remarks:—"When we take into consideration the mildness of the winter and the coolness of the summer, together with the remarkable equality of the temperature during the day and night, as well as throughout the year, we may safely conclude that the climate of Madeira is the finest in the northern hemisphere. That great and lasting benefit is to be derived (by an invalid) from a temporary residence in the climate of Madeira many living examples sufficiently prove."

The *Desertas* are three long, narrow rocks (one of them attaining the height of 2000 feet), lying at the distance of about 11 miles S.E. from the nearest part of Madeira. They present nearly vertical precipices to the sea on both sides, and are not easily accessible; yet persons visit them for the purpose of sowing a little grain and gathering the scanty crop. Rabbits and gulls are abundant, and there are seals at one of these islets.

Porto Santo, where a lieutenant-governor resides, lies about 25 geographical miles N.E. of Madeira, surrounded by several uninhabited islands and rocks. Its length is about $6\frac{1}{2}$ geographical miles, and its greatest breadth 3 geographical miles. Its population, according to the return of 1854, amounted to 1708 persons. The only town bears the name of the island, which is unproductive, the supply of water being scanty, and bare of every kind of wood. Before the grape disease made its appearance, 1500 pipes of wine of an inferior quality were annually made here, which was distilled into brandy, for the purpose of mixing

¹ Further information respecting the island will be found in a little work entitled *Madaira, its Climate and Scenery; a Handbook for Invalids and other Visitors*, 2d. ed., Edin. 1857.

Madeiras.

with the wines of Madeira. Around the town there is a large tract of comparatively level ground, great part of which is covered by calcareous sand (perhaps an ancient sand-dune) containing fossil land-shells. At the extremities of the island are hills, of which Pico de Facho, the highest, attains the altitude of 1660 feet. Small sailing boats are continually passing between Porto Santo and Madeira to convey to the former the various requirements of the inhabitants, including firewood, and the greater part of their food. Hardly any grain, besides barley, is cultivated.

Zoology.

Madeira has no indigenous land mammals. The wild goats and swine, spoken of by some of the early voyagers, must have escaped from confinement. The rabbit, which abounds in certain parts of the island, and at the Desertas, the black rat, brown rat, and mouse, have all been introduced. Seals, however, were encountered by the first comers, and this amphibious animal still haunts the Desertas. The porpoise is occasionally seen swimming near the shore.

As to birds, it appears that only one is peculiar, and that is a wren. Amongst the thirty species which breed on these islands are,—the kestrel, buzzard, and barn-owl; the blackbird, redbreast, blackcap, wagtail, goldfinch, two swifts, three pigeons, the quail, red-legged partridge, woodcock, two petrels, and three puffins. The green canary, the ancestor of our domesticated bird, is abundant here, as well as in the Canary Islands. About seventy other species have been occasionally seen at Madeira, straggling thither chiefly from the African coast, and many of them coming with the *leste*. The commonest of these are the sparrow-hawk, two herons, the common curlew, snipe, coot, water-hen, widgeon, kittiwake, and hoopoe. Sometimes the Egyptian vulture, the solan goose, the common starling, thrush, wren, skylark, sparrow, martin, turtle-dove, bittern, corn-crake, cuckoo, and crow, find their way thither, as well as the African bee-eater and the European goat-sucker.

The reptiles are very few, and none are poisonous. A small lizard (*Lacerta Dugèsii*) is abundant, and makes its appearance in thousands on a sunny wall. It was very destructive to the grape crop. A frog has been introduced, and is gradually making its way over the island. A turtle (*Cauwana caretta*, J. E. Gray) is frequently captured, and cooked for the table; but the soup is much inferior to that made from the green turtle of the West Indies.

The fishes are said to belong to nearly 190 species, many of which are peculiar, and beautiful or curious. Several of them are used for food, and amongst these are the tunny, which is sometimes taken of the weight of 300 lb., Jew-fish, mackerel, John Dory, grey mullet, red mullet, and braize. Amongst the more curious may be mentioned several species of shark, the torpedo, the stag-horned horse-fish, the striped remora, flying-fish, sword-fish, and trumpet-fish.

Nearly 1200 species of insects have been found at the Madeiras, and of these the beetles claim 555 species, the Hymenoptera about 217 species, and the Diptera about 160 species. The beetles have been described in Mr Wollaston's elaborate volume, *Insecta Maderensia*; but none of the other orders have yet received a close examination. Gay colours are rare in the Madeira Coleoptera, the tints being usually obscure. The type of this section of the fauna is, in the main, Mediterranean; and it is said to have a greater affinity to the fauna of Sicily than to that of any other country which has been hitherto investigated. One or two of the spiders are reputed to be poisonous.

About 119 species of shells, covering land molluscs, exist at the Madeiras, of which 111 are peculiar, and of the whole number, 76 belong to the genus *Helix*. In addition to the above, 13 species of dead land shells have been

found in calcareous sand-beds, which do not correspond to living species.

Madeiras.

A list, acknowledged to be incomplete, of 156 species of marine testaceous mollusca, found at Madeira, has been printed; 70 per cent. of the species being common to the Mediterranean and the Lusitanian coast, and 45 per cent. common to the coast of Britain. The corals are very few, but there are many kinds of sponge; none, however, of any value commercially.

A considerable number of the plants found in the lowest Botany.

regions have certainly been introduced since the colonization of the island by the Portuguese. Besides these, a large portion of the flora is of a Mediterranean character. Of the rest, the great majority is common to Madeira and the Canary Islands; but there still remain between 80 and 90 plants which are peculiar. The flowering plants, found truly wild, belong to about 364 genera and 650 species: the monocotyledons numbering 72 genera and 122 species; the dicotyledons 292 genera and 528 species. The proportion of monocotyledons to dicotyledons is therefore 10 to 43. The three largest orders are—Compositæ, Leguminosæ, and Graminaceæ. Madeira contains 41 species of ferns, 3 of which are peculiar to it, and 6 others belong to the peculiar flora of the islands of the North Atlantic. A connection with the flora of Madeira and that of the West Indies and tropical America has been inferred by the presence in the former of 6 ferns, found nowhere on the continent of Europe or in North Africa, but existing on the islands of the E. coast of the American continent, or on the Isthmus of Panama. A further relationship to that continent is to be traced by the presence in Madeira of the beautiful shrub *Clethra arborea*, Ait., belonging to a genus which is otherwise wholly American. In the lower regions the dragon-tree (*Dracæna Draco*, L.), and a cactus (*Opuntia Tuna*, Willd.) are forms more striking to the eye than any other amongst the indigenous vegetation. Of the former, very few wild specimens remain; but the Cactus exists in such abundance in the lower regions, as to give a character to the landscape. Amongst the trees, four of the laurel order are most conspicuous. The other trees most worthy of note are,—a *Pittosporum*, a *Heberdonia*, a *Juniperus*, a *Sideroxylon*, a *Rhamnus*, and an *Olca* (*Picconia*),—all now more or less scarce. The juniper attains a height of 40 or 50 feet, and yields a scented wood, which is prized by the cabinetmaker. Two heaths of arborescent growth, and a whortleberry, cover large tracts on the mountains. The flora of Madeira has been greatly defaced by the reckless hand of man. Several of the trees and shrubs grow only in situations that are nearly inaccessible; and some of the plants are of the greatest rarity. Few specimens of the noble forests that once clothed the island remain, and these are daily decreasing. The coast is too steep, and the sea too boisterous, for a luxuriant marine vegetation. Between high and low water mark there is a narrow fringe of *Ulvæ*, with a few small plants belonging to the orders *Fucaceæ* and *Ceramiceæ*.

Nearly the whole of Madeira is of volcanic origin. The Geology.

foundation of the island may have been either laid under the sea, or pushed through the floor of a continent; and two distinct causes, operating in some degree contemporaneously, have contributed to its present elevation. First, a long and complicated series of eruptions gradually piled up a mass of basalt, tuff, clinders, ashes, &c., to the height of between 4000 and 5000 feet; secondly, this mass, or so much of it as was then in existence, was upheaved to the extent of from 1000 to 2000 feet. Evidence that at least part of Madeira is of submarine origin is afforded by fragments of limestone imbedded in basalt and tuff, in a valley near the northern coast. Although the structure of the limestone has been much changed by heat, the genera of

Madeiras. its marine shells can still be identified. But it seems to be only the nucleus of the island that yields any trace of a submarine origin; the upper two-thirds at the centre, and all the exterior beds downward to the coast, are apparently of supra-marine formation. That there were pauses of considerable duration in the accumulation of the materials of the island, is shown by several facts. The lignite and leaf bed of San Jorge, lying under 1200 feet of lavas, prove that time was allowed for the growth of a vegetation of a high order. It is clear, moreover, that great alterations and dislocations had taken place in the rocks of various localities before other lavas and tuffs were in existence.

There do not appear to be any data for determining when volcanic action first commenced in this locality; but the limestone fossils, though scanty, afford evidence that the upheaval of that portion of the island at least took place during, or subsequent to, the miocene tertiary epoch. Nor is anything clear as to the period of the cessation of volcanic action. At the present day the subterranean fires seem perfectly extinct. There are no live craters, nor smoking crevices, as at the Canaries and Cape Verdes; or hot springs, as at the Azores. On the slopes which descend from the central ridge to the sea, especially in the neighbourhood of Funchal, there are many hills with conical shapes of more or less regularity, which seem to have been formed at a comparatively modern epoch. Volcanic cinders and slag are lying upon several of them, which look as if they had been thrown out of a furnace yesterday. Yet, round the base of others there may be traced streams of lava flowing from a higher source, and showing that, subsequent to the construction of these lateral cones, modern as they look, molten matter issued from higher vents, which assumed, on cooling, the character of ordinary compact basalt.

If we examine the general configuration of Madeira, we shall see a mountain chain, about 30 miles in length, running E. and W., and throwing off lateral ridges, that give it an extreme breadth of about 12 miles. Peaks rise about the middle to a height of more than 6000 feet; and deep ravines, lying between the lateral ridges, strike for the most part N. and S. from the central ridge to the sea. In the sections afforded by the ravines, the nucleus of the island is seen to consist of a confused mass of more or less stratified rock, upon which rest beds of tuff, scorizæ, and lava, in the shape of basalt, trap, and trachyte, the whole traversed by dykes. These beds are thinnest near the central axis; as they approach the coast they become thicker and less intersected by dykes. They do not often exceed 1500 feet in thickness, but a section in the Curral shows that they have there a thickness of 3000 feet. Near the axis their angles vary from 3° to 7°; but 2 or 3 miles away they are inclined at angles of 10°, 13°, and even 20°. Sir Charles Lyell is of opinion that these lavas issued, for the most part, from vents situate in the central district; that the form originally possessed by the whole island was that of a flattened dome, with sides varying in their slope from 3° to 7° or 8°; and that the present steeper inclination of the lava was acquired at a subsequent period, when shaken by convulsions which attended eruptions from lateral vents, whether clefts or craters, at a much lower elevation. At the centre of the island there are several summits of nearly the same altitude, and these are in some places connected by narrow walls and ridges, which are frequently quite impassable, whilst at others they are separated by ravines of enormous depth. On all sides are seen vertical dykes, projecting like turrets above the weathered surface of the softer beds. Sir C. Lyell found the materials of many of these peaks arranged with a quaquaversal dip, and he therefore considers them to be the ruins or skeletons of cones of eruption.

In the various parts of the island may be seen elevated
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tracts of comparatively level ground. These are supposed to have been formed by the meeting of numerous streams of lava flowing from cones and points of eruption in close proximity; various ejections assisting at the same time to fill up inequalities. Deep down in the lateral ravines, covered by beds of basalt, there exist cones of eruption which have been overwhelmed by streams of melted matter issuing from the central region, and afterwards exposed to view by the same causes that excavated the ravines. These ravines may be regarded as having been formed at first by subterranean movements, both gradual and violent, which dislocated the rocks, and cut channels along which streams flowed to the sea. In course of time the waters, periodically swollen by melted snows and the copious rains of winter, would cut deeper and deeper into the heart of the mountains, and would undermine the lateral cliffs, until the valleys became as wide as we now find them. Even the Curral, which, from its position in the centre of the island, its rounded shape, and other circumstances, has been usually deemed the ruins of a crater, is thought to be nothing more than a valley scooped out in the way described. The rarity of crateriform cavities in Madeira is very remarkable. There exists, however, to the E. of Funchal, on a tract 2500 feet high, the Lagoa, a nearly perfect crater, 500 feet in diameter, and with a depth of 150 feet; and there is another equally perfect in the district known as Fanal, in the N.W. of Madeira, nearly 5000 feet above the sea. The basalt, of which much of the upper part of the island is composed, is of a dark colour and a tough texture. It is sometimes full of vesicular cavities, formed by the expansion of imprisoned gases. Olivine and augite are frequently disseminated in it. A rudely-columnar structure is very often seen in the basalt, but there is nothing so perfect as Staffa or the Giant's Causeway. The trachytic rocks are small in quantity compared with those of the basaltic class. The tufa is soft and friable, and generally of a yellow colour; where a hot stream of lava has been poured over the tufa, it has assumed a red colour. Black ashes and fragments of pumice are sometimes found in the tuffaceous strata.

The mineral contents of the rocks of Madeira are unimportant. There are no metallic mines; a small quantity of native lead has, however, been found. The lignite is too impure to be of any value as fuel. No sulphur has been found; but a little iron pyrites and specular iron are occasionally met with. The mineral spring of St Antonio, near Funchal, is impregnated with carbonate of iron, and small quantities of the muriates of soda and magnesia, but no sulphates have been detected in it. The basalt yields an excellent building-stone, various qualities of which are quarried near Cama dos Lobos, 5 or 6 miles W. of Funchal. A small quantity of sienitic greenstone has been discovered, *in situ*, near Porto da Cruz, evidently pushed up from below.

At Porto Santo the trachytic rocks bear a much greater proportion to the basaltic than in Madeira. An adjacent islet is formed of tuffs and calcareous rock, indicating a submarine origin, upon which supra-marine lavas have been poured. The older series contains corals and shells (also of the miocene tertiary epoch), with water-worn pebbles, cemented together by carbonate of lime; the whole appearing to have been formed upon an ancient beach. The calcareous rock is taken in large quantities to Funchal, to be burnt into lime for building purposes.

Some philosophers have thought that many of the facts regarding the fauna and flora of the Atlantic islands may be explained by supposing that there existed, at a geologically modern period, a large tract of land which connected these islands with the continents of Europe and Africa. (J. R. J.)

MADEIRA, a river of South America, Brazil, formed by the junction of the Beni and Mamore, in S. Lat. 10. 23., W.

Madison, James
 ||
 Madison.

Long. 65°, and falling into the Amazon after a N.E. course of about 700 miles.

MADISON, JAMES, fourth president of the United States of America, was born in Virginia in 1758. He was educated at the college of Princeton, in New Jersey, where he graduated in 1772, and commenced to prepare himself for the bar. He began his political career in 1776 as a member of the Virginia Convention, when he gave early proof of high talent and patriotic zeal. He took his seat as a member of Congress in 1780. After the settlement of the dispute between Great Britain and the colonies, Madison returned to private life, to prosecute his legal studies and extend his acquaintance with natural history, his favourite branch of science. He was again elected to the Virginia legislature in 1784, when he planned and took an active part in completing the constitution of the United States. His personal record of the debates of the convention respecting the constitution is the only complete or authentic information on that subject extant. He was chosen a member of the first Congress under the constitution in 1789, when he gained the friendship and esteem of General Washington and other eminent men of his time. When Jefferson was elected president, he became his secretary of state, and took an active part in the negotiations then pending between the United States and Spain, Britain, and France. His *Examination of the Doctrines of National Law* is said to be one of the ablest papers on the relative rights of neutral and belligerent powers to be met with. He succeeded Jefferson as president in 1809; and one of his first acts was to forbid all communication with England and France till those powers should revoke their orders in council and their Berlin decrees. France complied, but England stood firm, and this induced a five years' war between the United States and Britain. Notwithstanding the misfortunes of this war, and the active opposition of the federalists, Madison retained the presidency till 1817, when, peace being concluded with Britain, he retired from office with a high reputation for eminent ability and spotless integrity. With the exception of occasional assistance given to the legislature of Virginia in revising their constitution, and the discharge of the duties of rector of their university, Madison remained in the closest retirement till his death in 1836, at the advanced age of eighty-five. His debates, letters, papers, essays, and miscellanies, were purchased by Congress for 30,000 dollars, and published in 3 vols. large 8vo, under the editorial superintendence of H. D. Gilpin, in 1840.

MADISON, a city of the United States of North America, capital of the state of Wisconsin, Dane county, on an isthmus between Third and Fourth Lakes, 80 miles W. of Milwaukee. The land on which it stands rises abruptly from the lakes; and has a generally unequal surface, commanding, however, a most extensive and charming prospect. The capitol, built of limestone, is situate on a platform 70 feet above the lakes; and to the W. of this, on an eminence nearly 60 feet higher, stands the Wisconsin university, founded in 1851. Iron and wool are manufactured here, and a brisk trade is carried on in agricultural produce. Water power is abundant; and by railway the town is connected with the Mississippi and Lake Michigan. Pop. (1850) 1525, (1855) 8664.

MADISON, a town and river-port of the United States of North America, capital of Jefferson county, Indiana, on the right bank of the Ohio, 86 miles S.S.E. of Indianapolis. It is beautifully situate in a valley nearly 3 miles long, and inclosed on the N. by steep and rugged hills. The streets are well built, and the houses are mostly of brick. Its chief edifices are,—a court-house, a gaol, two market-houses, and several large schools. The inhabitants are principally employed in manufacturing cotton, wool, iron, and oil. Steamers from this port communicate regularly with the

Mississippi throughout the year, navigation being usually open here all winter. Madison was settled in 1808. Pop. (1850) 8681, (1853) about 12,000.

MADRAS, a city of Hindustan, and the capital and seat of government of the presidency of the same name, is situate on the coast of Coromandel, on the western shore of the Bay of Bengal. The English possessed no fixed establishment here until A.D. 1639, when they received a grant from the Hindu dynasty of Bijanagur, then reigning at Chandergherry, permitting the erection of a fort. In consequence of this permission, Mr Day, the chief of the factory at Armegon, proceeded with great alacrity to the construction of a fortress, which was soon surrounded by a town; and this town he allowed to retain its Indian appellation, but the fort he named Fort George. The territory granted along with it extended 5 miles along the shore, and 1 mile inland. The fort is an irregular polygon, somewhat in the form of a semicircle, of which the sea-face is nearly a diameter, and presenting a front on that side of 500 yards. Towards the land, the fort presents a double line of fortifications, both bomb-proof. The sea-face is armed with heavy guns. Within the inclosure are the barracks, which are said to be capable of affording accommodation for 1000 men. Attached to the barracks is a bazaar for the supply of the troops; the other buildings within the fort are,—the old church, the exchange, and various government offices. A wide esplanade separates the fort from the Black Town of Madras. The latter is inhabited chiefly by natives. There are three broad streets running N. and S., and dividing the town into four nearly equal parts. These streets are well built, and contain many houses with upper storeys and terraced roofs. On the beach, parallel with these streets, is a line of public offices, including the supreme court, the Marine Board office, the custom-house, and the offices and storerooms of the principal European merchants. These are well finished buildings. In conspicuous situations in the town are the male and female orphan schools. The other buildings of note are,—the gaol of the supreme court, the mint, the Roman Catholic cathedral, the Church Mission chapel, the Armenian church, Trinity chapel, the general hospital, and medical school. Various suburbs, or divisions, have gradually grown up around the old town and are now included within the city. These are Royapooram, on the N. of the Black Town; Vepery, including Pursewakum, situate to the W.; Chintadrappettah, separated from Vepery by the River Koom; Poodoopetta and Egmore, lying W. of Chintadrappettah; and Triplicane with St Thome, situate to the S. of the fort. The accession of these divisions has imparted an irregular shape to the city of Madras, the circumference of which is stated to be about 12 miles. The population has been estimated at 720,000. Triplicane is divided from the fort by the River Koom. About a mile from its mouth, this river divaricates, forming two nearly equal branches, the left, or more northern of which flows by the fort, while the right takes a direction first S., and subsequently S.E. The two branches meet each other about 300 yards from the sea, and inclose an island three-quarters of a mile in length, and of half that in breadth, laid out with roads, and ornamented in the centre by a statue of Sir Thomas Munro. On the bank of the right branch of the river are the government gardens. Government House is large and handsome; the floors, the walls, and the pillars, are of the most beautiful chunam of different colours, almost equal in splendour to marble itself. The roads are a great ornament to the place, being broad, and shaded on each side by a noble avenue of trees. Chepak Garden, the residence of the last Nawab of the Carnatic, is situate S.E. of Government Garden; and between it and the sea is a mosque of some architectural excellence, the only Mussulman place of worship of any importance in the city. The principal church belonging to the English establishment is that of St

Madras.

Madras. George, situate in Royapetta. It is said to be very beautiful. St Andrew's church, built for the use of the members of the Church of Scotland, is in the southern part of the Vepery division. It has been regarded as a fine specimen of architecture and engineering skill; but Bishop Heber thought the form injudicious with a view to hearing. It was finished in 1820, at a cost of about L.20,000. The European residents live in garden-houses, or villas, situate in compounds, or distinct inclosures, dispersed throughout the suburbs, and about the neighbourhood of the city, extending from 3 to 4 miles inland. These are generally of two storeys, constructed in a pleasing light style of architecture, terraced with porticos and verandahs supported by pillars.

In Lord Valentia's account of Madras, it is observed, that it would probably have been difficult to find a worse place for a capital than that chosen for Madras, on the extreme point of a coast where the current is most rapid, and where a tremendous surf breaks even in the finest weather. But the original error of fixing on this for the site of a great capital cannot now be recalled, the expense of removal to a more convenient spot would be so great. Owing to the exposed situation of Madras, it affords no secure anchorage; and there is always a great difficulty in landing from vessels, which generally moor in 9 fathoms, with the flag-staff W.N.W., about 2 miles from the shore. Any ship's boat that should attempt to cross the surf would inevitably perish; and, accordingly, the boats from ships anchor outside the broken wafer, and wait for the country boats to carry the passengers safely to the shore. These boats are of a particular construction, being built of soft wood, with flat bottoms. They are sewed together, and have not a nail in their whole construction, so that they are very light and pliable, and are borne many yards through the surf without injury, as they yield to the waves like leather. These boats require to be guided by seamen of experience and tried skill; and it is an extremely critical operation to conduct them through the surf. When they come within its influence, the cockswain stands up, and, under great agitation, marks time with his voice and his foot, whilst the rowers work their oars backwards until overtaken by the swell, which, curling up in its approach to the shore, sweeps the boat along with fearful violence. The rowers now ply every oar forward with their utmost vigour, to prevent the wave from carrying back the boat with its receding swell; and by a few successive surfs the boat is at length dashed high and dry on the shore. A species of floating machine, called a *catamaran*, formed of two or three light logs of wood, 8 or 10 feet in length, lashed together with a small piece of wood inserted between them, to serve as a stem-piece, is employed by the fishermen and lower classes of natives to carry them through the breakers. On these they go out to fish, or to carry letters, or small quantities of refreshments to ships, when no boats can venture out. They secure the letters in a pointed cap, where they cannot be damaged; and when the men happen to be washed off by the surf, they regain the catamarans by swimming, unless when they are attacked by a shark. The dexterous navigators of these frail vessels, who distinguish themselves by saving persons in danger, or by their care in conveying papers through the surf in dangerous weather, are rewarded with medals. European passengers, when they land at Madras, being ignorant of the language, manners, and customs of the country, necessarily rely on the natives for help; and accordingly passengers landing at Madras are immediately surrounded by numerous servants of all kinds, called *dobashies*, eager for employment. They undertake to transact for the Europeans all their necessary business, to buy all that is wanted, and to procure servants, tradesmen, palanquins, and the like.

Madras, when seen from the sea, presents a striking appearance, the fortifications of Fort St George being within

a few yards of the shore; and, at a distance, minarets and pagodas are seen mixed with trees and gardens. The public offices and storehouses are fine buildings, with colonnades to the upper storeys, supported on arched bases, covered with beautiful shell-mortar from Madras, which is hard, smooth, and polished. These being near the beach, which is always crowded, form interesting objects. At a distance, the low, flat, sandy shores extending to the N. and S., and the small hills that are seen inland, give an appearance of barrenness, which, however, improves on a closer inspection. Madras is surrounded by a level country, which in general exhibits a naked, brown, dusty plain, with few villages to enliven the scene, or any other objects to relieve the eye, except a range of abrupt detached hills to the S. The huts of the natives are covered with tiles, and are fully superior in their appearance to those in Bengal; and in the inns and choultries, also, which are common on the roads, travellers experience greater attention.

Madras being the seat of the government of the presidency, the governor, members of council, and public functionaries reside here, as do also the judges of the supreme court. The chief establishments of every department of the government are here, and there are various local establishments. Among these may be mentioned the police-office, the court for the recovery of small debts, the government savings-bank, the bank of Madras, and various insurance offices. Madras is the seat of an episcopal see. In addition to the principal church (St George's) there are about eight English churches and chapels of the United Church of England and Ireland. In the Scottish church of St Andrew, already mentioned, the worship is conducted by ministers in communion with the Established Church or Scotland, of whom two are chaplains in the service of the Company. The seceding body from the Established Scottish Church, calling itself the "Free Protestant Church of Scotland," maintain public worship in the hall of the Free Church Mission Institution. The Romanists have a bishop, or vicar-apostolic. The Wesleyans have five chapels, the Baptists two, the Independents one, and the American Mission two. Measures have been recently taken for the introduction of a new scheme of state education throughout India, in the benefits of which the city of Madras will largely participate. There is an agricultural and horticultural society, of which the governor is the patron. The Madras Literary Society enjoys the same distinguished patronage, and now adds to its title that of the "Auxiliary of the Royal Asiatic Society." About nine or ten newspapers are published at Madras, some of these three times a week, some twice, and some once only.

In 1744 Madras was besieged by the French from the Mauritius under M. de la Bourdonnais. The town was taken on the 10th of September, and was ransomed for L.440,000, exclusive of plunder, which amounted to L.200,000 more. All the British inhabitants were afterwards compelled to abandon the place. Madras was restored at the peace of Aix-la-Chapelle, and evacuated by the French in August 1749, when it was found in a very improved condition, the bastions and batteries having been greatly enlarged and strengthened. The defences of the town were still, however, inferior to those of Fort St. David, where the East India Company ordered the presidency to continue. Madras was again besieged in 1758 by the French under M. Lally. The siege commenced on the 17th of December, and was prosecuted with vigour till the 17th of February 1759, when the French were obliged precipitately to raise it. This was the last and most memorable siege which Madras ever sustained. The garrison consisted of 1758 European troops, 2200 Sepoys, and 150 European inhabitants. The besieging force consisted of 3500 Europeans, 2000 Sepoys, and 2000 native and European cavalry. Since this period Madras has never been assailed by an enemy, though nearly

Madras.

Madrid. approached by Hyder's cavalry in 1781, when they descended from the mountains to ravage the plains of the Carnatic. The population of the city of Madras, including the suburbs, has been estimated, as above observed, at 720,000. Lat. 13. 5., Long. 80. 21.

The presidency of Fort George, or of Madras, comprehends nearly the whole of India S. of the Krishna River, and also that large portion of the Deccan, the Northern Circars. Within these boundaries there are several native states. The rest of the country is under the immediate jurisdiction of the governor and council of Madras, and, for the collection of the revenue and the administration of justice, is divided into districts. The names of these, with their respective areas and amount of population, are set forth in the following tabular statement:—

Districts.	Area in Square Miles.	Population.
Rajahmundry.....	4,501	1,012,036
Masulipatam.....	4,711	520,860
Guntoor, including Palnaud.....	4,752	570,089
Nellore.....	7,959	935,690
Chingleput.....	2,717	583,462
Madras, City of.....	27	720,000
Arcot, south division, including Cuddalore...	5,020	1,006,005
Arcot, north division, including Consoddy...	6,580	1,485,873
Bellary.....	12,101	1,229,599
Cuddapah, including Poonganoo.....	13,298	1,451,921
Salem, including Vomundoor and Mulla-		
pandy.....	7,499	1,195,377
Coimbatore.....	8,151	1,153,862
Trichinopoly.....	2,922	709,196
Tanjore, including Najore.....	3,781	1,676,086
Madura, including Shevagunga and Ramnad	13,545	1,756,791
Tinnevely.....	5,482	1,269,216
Malabar.....	6,050	1,514,909
Canara.....	7,152	1,056,333
	116,248	19,847,305
Ganjam.....	5,758	926,930
Vizagapatam.....	4,690	1,254,272
Kurnool.....	3,278	273,190
Coorg.....	2,116	Not known.
Total.....	132,090	22,301,697

The native states of Travancore and Cochin, and the hill zemindaries adjoining the British district of Vizagapatam are also under political and military management of this presidency. Mysore, though under the political management of the government of India, is subject, for all military purposes, to the jurisdiction of the Madras presidency, by the territories of which it is indeed almost completely surrounded. Their respective areas are stated as follows:—

	Square Miles.	Population.
Cochin.....	1,988	288,176
Mysore.....	30,886	3,460,696
Poodocottah (Rajah Tondiman's dominions)...	1,165	61,745
Travancore.....	4,722	1,011,824
Jeypoor and hill zemindars.....	13,041	391,230
Total.....	51,802	5,213,671

And if to these aggregates be added the area and population of the territory of the Company in this presidency, the total area will amount to 183,892 square miles, and the total population to 27,515,368.

(Further particulars connected with the Madras presidency will be found under the article HINDUSTAN, and also under the names of the various provinces and districts into which the presidency is divided.) (E. T.)

MADRID, a province of Spain, one of the five into which New Castile is divided, lies between N. Lat. 39. 53. and 41. 7., W. Long. 3. 10. and 4. 35. It is divided into thirteen *pañidos*, containing 225 *pueblos*, with a population in 1849 of 405,737, in a space of about 1310 square miles. It is separated from the province of Guadalajara by the Somosierra, and from Segovia by the Carpetanos and the Sierra

Guadarrama, whose ramifications form the principal mountains of the province. It lies in the basin of the Tagus, which, rising in the province of Cuenca, arrives in that of Madrid after a course of 20 leagues, and leaves it after a tortuous course of about 18, having received the Jarama, and some less important streams. Other rivers in this province are the Lozoya, the Guadarrama, the Manzanares, the Tajuña, and the Henares. The soil is mostly clayey, and there are sandy tracts. Agriculture is in a backward and neglected condition. The productions consist of wheat, barley, rye, oats, algarrobas (a kind of pulse), pease, French beans, and other legumes; wine, oil, flax, hemp, fruits, wax, honey, &c. Gardening is carried on to some extent near the capital, though the markets of Madrid receive their most liberal supply of fruits and vegetables from Valencia. Sheep, goats, and horned cattle are reared; and fish are found in the Jarama and other rivers. In the Sierra Guadarrama are quarries of granite, lime, and gypsum. There are mines of lead, iron, and copper in the same sierra, and several of silver, not at all productive. There are manufactures of coarse cloth, of baize and frieze, of counterpanes and other coarse stuffs; also of leather, paper, earthenware, porcelain at Moncloa, bricks and tiles, saltpetre, glass and crystal, guitar strings, chocolate. The extensive cotton manufactures of San Fernando, about 22 leagues from Madrid, have been for many years discontinued. Many women, especially in the *partido* of Getafe, are employed in the embroidery of tulle for mantillas. There is very little commerce beyond that for the supply of the capital with necessaries. Primary instruction not many years ago was deplorably neglected, but there has recently been some advance in this respect. The university of Alcalá has long been transferred to Madrid, so that the whole higher instruction of the province is centred in the capital.

On account of the elevated situation of this province, and its being surrounded with snow-covered summits, the air is at all seasons keen and penetrating, and even in the suffocating heats of summer the breeze is cold; yet the climate is generally salubrious.

MADRID, capital of the above province and of Spain, is situate in N. Lat. 40. 24. 57., W. Long. 3. 41. 51., on the left bank of the River Manzanares, an affluent of the Tagus, at an altitude of 2245 feet above sea-level. It occupies nearly the centre of the kingdom, being about 300 miles from the Atlantic, and an equal distance from the Mediterranean, 240 miles S.W. of Bayonne, and 350 E.N.E. of Lisbon. It stands on some sandy hills of little elevation, in the midst of an extensive plain, bounded to the view on only one side, by the mountains of Somosierra and Guadarrama. The basin in which it stands is of tertiary formation, consisting of gypsum, marl, meerschaum, and limestone. Owing to its elevation and exposure, the air is extremely subtle and keen. The mean temperature in winter is 43°, though the thermometer frequently indicates 32° and under; in summer the mean is 76°, while, during the S.E. wind, the thermometer often indicates 90° or 105° in the shade. These extremes, which have given rise to the adage, "*Tres meses de invierno, y nueve del infierno*" (three months of winter, and nine of hell), are very prejudicial to health, causing pulmonary diseases, which, with the convulsive colic, may be called endemic; pulmonia carrying off many victims every year at the beginning of winter, and during the long-continued colds of that season; while, even in the suffocating heats of July and August, the breezes from the snow-covered Guadarrama often sweep along the streets with a death-like chill. The natural insalubrity of the city is enhanced by the want of water, and by the neglect of sanitary precautions on the part of the inhabitants.

The form of Madrid is that of a square, with the corners rounded off; from E. to W. it measures about 2640 yards, and 2970 yards from N. to S. It is surrounded by a very

Madrid.

Madrid. poor wall, partly built of brick, partly of earth—the house walls in some quarters forming part. There are five gates (*puertas*), whose names indicate their position,—Alcalá, Bilbao, Segovia, Toledo, and Atocha,—and eleven *portillos*. Of these sixteen entrances, the finest is that by the Puerta de Alcalá, which terminates the Calle de Alcalá, the handsomest street in the town. The puerta is in the modern Ionic style, with three archways, and was erected by Charles III. in 1778. The Portillo de San Vicente, erected by the same monarch in 1775, deserves notice; it is built of Colmenar granite. The Puerta de Toledo, erected 1813–27, in honour of the restoration of Ferdinand VII., is a pretentious but heavy structure. Madrid is divided into ten districts, and consists of 512 streets and 70 plazas, large and small. The old streets are irregular, tortuous, and narrow, but the modern ones, especially in the E. part of the town, are broad and handsome. The Calle de Alcalá, already mentioned, which connects the Prado with the Puerta del Sol, is a very fine street, bordered on both sides with acacias, and containing some elegant buildings; but its irregularity in point of width and level detract much from its appearance. The Calle Mayor, De la Montera, Caballero de Gracia, Hortaleza, Fuencarral, Carrera de San Geronimo, and Atocha, deserve notice. The Plaza Mayor is a rectangle of about 400 feet by 306; the houses are uniform in height and decoration, and have porticos. Here the executions and royal bull fights were celebrated, the royal family viewing them from the Panaderia. There is in the centre a bronze equestrian statue of Philip III., designed by Pantoja, and cast by Juan de Bologna, which has been much admired. The Puerta del Sol, formerly the east gate and tower of the city, having on its front a representation of the sun, is now the central plaza, and the favourite lounge and place of most traffic in the city. It is situate in the confluence of four principal streets, and contains only one building worthy of attention, the Casa de Correos. The Plaza de las Cortes, so called from the house of deputies, is remarkable as containing the fine statue of Cervantes by Solà, erected in 1835. The most frequented promenade is the Prado on the east and north sides of the city, in length about 9650 feet. It was planted by the Conde de Aranda in the time of Charles III., and laid out by José Hermonvilla. It contains some indifferent monuments and fountains. On the E. are the gardens of the Buen Retiro laid out by Olivares; on the W. the Florida; on the N. the Delicias; and on the S., Chamberri. These are less frequented.

Madrid has small architectural pretensions, and is almost wholly without Roman, Moorish, or Gothic remains. Her most ancient public buildings are in the worst style of the renaissance, and the private houses in general mean and incommodious. Like the other large towns in Spain, Madrid is disfigured with numerous heavy-looking convents. There are altogether sixteen churches and sixty-one convents, besides chapels and convents which have been put to other uses. The church of Maria de la Almudena is the *iglesia mayor*, and the most ancient, having been a Moorish mosque; it is small and of no merit. Perhaps the finest church in Madrid is that of the convent (*de monjas*) of La Encarnacion, in the form of a Latin cross, and with Ionic decorations; its high altar is very fine. The chapel of Las Salesas Viejas, a large convent of nuns, erected by Barbara, queen of Ferdinand VI., as a seminary and retreat for herself, has been converted into a parish church. It is a fine Corinthian structure, and the marbles of the high altar are magnificent. The convent of San Geronimo, founded by Enrique IV., one of the few Gothic specimens, contained numerous marble sepulchres of eminent men, which were mostly destroyed by the French, with those in the church of San Martin. The structures for civil purposes are better, and the Palacio del Congreso de Diputados, begun in 1843,

deserves particular mention. The Aduana, erected 1769, is a fine large building in the Calle de Alcalá, and contains various public offices. The barracks of the Life-Guards, occupied by cavalry, is an enormous but tasteless erection of the last century.

There are two royal residences in the city,—the Palacio Real and the Palacio de Buen Retiro. The former is one of the largest and finest in Europe. At first view its aspect is very imposing; a closer inspection disappoints. It is built on the site of the ancient Moorish Alcazar. When Charles V. made Madrid his residence in 1532, he caused the Alcazar to be improved and enlarged, and the obstructing houses to be demolished. Philip II., and the succeeding monarchs, continued the improvements; but the whole was destroyed by fire in 1734. The present edifice was begun in 1738, under Philip V., by Sachetti of Turin, and was not finished till 1764; the palace of Buen Retiro being occupied in the meanwhile. The wings and hanging gardens are still unfinished. It is a square of 470 feet each way, and about 100 feet in height, vaulted throughout. The reception-room is very magnificent. Marbles are used profusely for the floors and doorways; and the ceilings are painted by Mengs, Antonio Velasquez, Maella, Jaquinto, Bayeu, and Tiépolo. This palace contains the Bibliotheca de Camara and the Armeria Real. The former consists of about 200,000 volumes, and from 2000 to 3000 MSS. (See LIBRARIES). The latter, occupying the south façade, is perhaps the finest armoury in the world, containing numberless weapons, native and foreign, of all ages. The royal chapel, though plundered in 1808 of its fine pictures, is still very magnificent. The order is Corinthian; the decorations very splendid. The Palacio de Buen Retiro exists in a state nearly approaching to desolation, the damage done by the French never having been entirely repaired. The oldest part, built by Olivares for Philip IV., is a large regular square, but subsequent additions and improvements have destroyed the harmony of the whole. The palaces of the *grandees*, if we except those of the Duque de Liria, the Conde de Altamira, and Don José Salamanca, are not remarkable. Those of Alba, Liria, and Medinaceli contain valuable galleries of pictures. There are eight theatres: the Teatro del Principe, erected in 1806 by the architect Villanueva, is the most elegant and best arranged in the city; the Teatro del Cruz, erected in 1737 by Ribera, and capable of containing 1500 persons, is in exceedingly bad taste, and inconveniently constructed. The Plaza de Toros, built in 1749, is about 1100 feet in circumference, and contains 12,000 spectators; and the bull-fights are held between the months of April and November. One of the finest public galleries in the world is the Museo de Pinturas, situate in the Prado—a heavy, indifferent building,—which contains the collections formed by Charles V., Philip II., and Philip IV., and numbered 1833 pictures in 1850. The specimens of Raphael, Titian, Murillo, and especially Velasquez, are numerous and remarkable.

There are 60 public schools of primary education in Madrid, besides *escuelas pias*, *colegios*, and private institutions. Modern educational movements have not left Madrid unaffected, and great improvements in this respect have taken place within the last fifteen years. Female education is chiefly carried on in convents. The university of Alcalá, founded by Cardinal Ximenes in 1508, was transferred in 1836 to Madrid, and has since that time undergone much reform and extension. In 1845 chairs of medicine, natural history, and astronomy were added. There is a school for the blind, one for deaf-mutes, and schools of engineering, military science, and the fine arts. Among educational institutions may be reckoned the botanical garden, laid out in 1781; the library of San Isidro, which contains about 60,000 volumes, and the museum of natural science, formed chiefly under Charles III. on the several purchased collections augmented by contributions from the

Madrid.

Madridejos
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Madrigal.

Spanish Indies. The collection contains the most magnificent crystals of emerald in the world, and fine ores of the precious metals. The principal learned society (*Academia*) is the Royal Spanish Academy, founded in 1713, for the study and improvement of the Castilian language. The Academy of History possesses a fine collection of coins and medals; there are also academies of natural science, archaeology, fine arts, ecclesiastical science, and legislation. Of these associations it may be said that their projects are much more magnificent than their actual results.

The hospitals of Madrid are very numerous; the principal is the General or United Hospital, a very large building in the Calle de Atocha, containing 1526 beds, and receiving patients of both sexes. There are three founding hospitals, and two for orphans. The military hospital is large and well conducted; it occupies the former seminary of the nobility in the Plazuela del Seminario. There are, besides, hospitals for the reception of foreigners, and for the natives of several Spanish provinces.

The manufactures of Madrid are inconsiderable; every article of food and clothing, almost without exception, is imported. Tapestry, carpets, and china are manufactured for the court. Deserving of notice are the saltpetre works, the manufacture of hats, that of looking-glasses, and some breweries. Little wine is grown near the capital, and not much fruit; but the markets are well supplied, and regularly, from all quarters of the kingdom.

The environs of the city are uninteresting; the sole attractive points being the royal villas of La Moncloa, on the road to the Escorial, close to the Manzanares, El Pardo, a fine hunting-seat restored by Charles III.; and La Vista Alegre. About 3 miles on the Toledo road are the Caravanchales, two villages of pleasurable resort. The village of Loeches has a convent remarkable for a fine collection of paintings. A railway between Madrid and Aranjuez has been constructed; others are contemplated.

Spanish archaeologists have claimed for Madrid a very high antiquity; but its origin and that of its name are exceedingly obscure. The immediate source of the latter is the Arabic appellation *Majrit*. The earliest authentic historical mention of the town corresponds to A.D. 932. It first rose to importance when Charles V., benefiting by its keen air, made it his occasional residence, and founded the Palacio Real; Philip II. formed a similar attachment, and created it his capital and "only court" in 1560. Fruitless attempts have been repeatedly made by subsequent monarchs to transfer the seat of empire to Valladolid or Seville.

The population of Madrid amounted in 1845 to 216,740, including the garrison. This population, composed of natives of all the Spanish provinces, has little common character beyond that of indolence.

MADRIDEJOS, a town of Spain, province of Toledo, on the high road of Andalucía, which crosses the plains of La Mancha, 40 miles S.E. of Toledo. The streets are broad and regular; but the houses are old, built of *tapia*, and have a mean appearance. The church of the Franciscan nuns, and the convent San Cristo del Prado, are good edifices; the latter is surrounded with trees, and has a fine promenade in its vicinity,—the only place of recreation in the town. Madridejos is supplied with water from wells, and from springs in the neighbouring hills. The manufacture of bombasin has much decayed of late years in the town, from the cheapness of foreign productions. The surrounding district is of good soil, and grows wheat, rye, wine, oil, and saffron. There are also numerous quarries of gypsum and limestone. Market-day, Saturday. Pop. 5160.

MADRIGAL, a short poem, composed of a number of free and unequal verses, neither confined to the regularity of a sonnet, nor to the point or antithesis of an epigram, but only consisting of some tender and delicate thought, expressed with elegant simplicity. The derivation of the

Madura
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Mæcenæ.

word cannot be determined. The earliest madrigals were those of Lemmo of Pistoia. The composition of madrigals attained a very high degree of excellence in England during the reign of Elizabeth, and are said to be in no way inferior to those of Italy. Orlando Gibbons is the best known among the English madrigal composers; Marenzio and Clari among those of Italy.

MADURA, an extensive district of Hindustan, situate within the presidency of Madras. It is bounded on the N. by the districts of Trichinopoly and Coimbatore; on the N.E. by Tanjore and the native state of Poodoocottah; on the E. by Palk's Straits and Tanjore; on the S. by the Gulf of Manaar, and on the W. by Travancore. It lies between Lat. 9. 5. and 10. 54., Long. 77. 15. and 79. 15., and has an area of 10,700 square miles. The principal river is the Vygar, which, after a course of about 180 miles, falls into Palk's Strait, a short distance N.W. of the headland of Tonitorai. The climate of the hills is mild and genial in summer. It is said, moreover, to be cold in January, when the ground is covered with hoar-frosts during the morning; but the climate of the plain is characterized by dryness and heat, the thermometer having been known to reach 115°, and according to some, 130°. This district participates in the vicissitudes of the two monsoons. Its population, including Dindigul, amounts to 1,756,791. The territory came into the possession of the British in 1801. The name of the capital is Madura, an ancient city, the four sides of which front nearly the four cardinal points. It was formerly well fortified with a ditch, rampart, and square towers; and from 1740 to 1760 sustained many sieges, and was often in possession of refractory Polygars. Since it has come into the possession of the British, considerable improvements have been made in the town by laying it out with wide streets, market-places, and accommodation for travellers, whereby the public health and convenience have been greatly promoted. E. Long. 78. 10., N. Lat. 9. 55. (E.T.) MADURA, an island in the Eastern Archipelago, lying immediately N.E. of Java, with which island it is conjoined under the Dutch government. (See JAVA.)

MEANDER, a river which rises in Phrygia, not far from Celænæ, and on leaving that province forming the boundary between Caria and Lydia. It fell into the Ægean Sea between Miletus and Priene, which latter city had gradually been removed 40 stadia from the sea by the muddy deposits of the river. It was remarkable for the winding character of its stream; hence the origin of the word "to meander." (Str. xii. 577, 579; Pl. v. 31, 3.) It is joined by the Marsyas, Obrimas, Glaucus, Lycus, &c. It is now the *Meinder*, or *Boyük Meinder*.

MÆCENAS, CAIUS CILNIUS, the friend and counsellor of Augustus Cæsar, a man whose name has become a synonyme for a patron of literature, from the munificent and generous support he afforded to the learned. He flourished from about 41 to 8 B.C. He was very generally considered by the ancients as descended from the royal line of Etruria. The family of the Cilnii is mentioned by Livy (x. 3) as very powerful at Arretium, now Arezzo, B.C. 300. We have no account of the early years of Mæcenas, but there is little doubt that his education was carefully attended to, and becoming the dignity of his birth. In what way he acquired the friendship of Octavius we have no means of knowing; but we find him actively engaged in his cause immediately after the murder of Julius Cæsar, B.C. 44. His talents seem to have been particularly adapted for the administration of the civil affairs of government, and we find him more frequently thus engaged, than in the active business of war. He was employed (B.C. 40) to negotiate the marriage between Augustus and Scribonia, the sister of Scribonius Libo, the father-in-law of Sextus Pompey, with the view of securing a channel by which he might obtain peace with Pompey if circumstances should require it (Appian. B. C.

Mæcenas. v. 53). The same year Mæcenas was one of the commissioners appointed to negotiate the peace between Antony and Octavius at Brundisium, which was sealed by the marriage of Octavia and Antony (v. 64). He was again the principal person employed in the conference between Octavius and Antony (B.C. 37), on the banks of the river between Metapontum and Tarentum, when peace was agreed upon (v. 92). He had the command of the whole of Italy and Rome at the time of the battle of Actium, B.C. 31, at which period he put down a conspiracy entered into by Lepidus the son of the triumvir (iv. 50; Vell. Pat. ii. 88). The victory at Actium having placed the Roman empire in the hands of Octavius, he consulted with his friends, Agrippa and Mæcenas, whether he ought not to abdicate his authority. Agrippa advised him to restore the republic, but Mæcenas was of a contrary opinion. The speeches which they each delivered are given by Dion Cassius (41, 1-40). Augustus adopted the opinion of Mæcenas, and was guided in all his more important transactions by his advice, having confidence not only in his good sense and discretion, but in the integrity of his character. To Mæcenas, therefore, may in a great measure be ascribed the glory of his reign. After his death, Augustus frequently regretted that he had no longer a friend to assist him; and when he had committed any act of which he repented, he used to say, that if Mæcenas or Agrippa had been alive, he would not have had cause to reproach himself for the folly of his conduct (Sen. *De Benef.* vi. 32). It is said that Mæcenas one day observed Augustus on the point of condemning some persons to death, and being unable to approach the tribunal on account of the crowd, he threw a paper to him, on which he had inscribed these words, "Descend from the tribunal, thou butcher;" upon which Augustus, struck by the admonition, left the judgment-seat without passing sentence. The palace of Mæcenas was on the Esquiline Hill, and his gardens are frequently mentioned as occupying the ground which had been previously employed as the place of burial for the poor (Tacit. *Ann.* xv. 39). It is, however, to his generous patronage of the learned that he is principally indebted for his fame; and their gratitude has amply repaid all the attention he may have bestowed on them. His palace was the common resort of all the literary characters of his age. There might be found Virgil and Horace, Varius, famed for his tragedies, Propertius, Domitius Marsus the rival of Catullus, Valgius, Plotius, and Tucca. It was through Mæcenas that the learned had access to the emperor, and were loaded with his favours. Horace gives a very interesting account of his introduction to Mæcenas, which must have taken place as early as B.C. 40, when both the poet and Mæcenas were still young. To Mæcenas Horace was indebted for his Sabine farm; and Virgil was through him restored to his paternal estate near Mantua. Virgil dedicated the *Georgics* to his patron; and to him Propertius has dedicated several of his poems. It is needless to add, that much of the poetry of Horace was also addressed to him. Mæcenas has been accused, however, of being devoted to pleasure; but his faults were those of the age in which he lived, and his virtues were his own (Senec. *Epist.* 92, 114). Virgil died many years before Mæcenas, B.C. 19; but whether Horace predeceased Mæcenas or not is uncertain. Horace died in the month of November B.C. 8 (Sueton.); and Dion Cassius (41, 3) mentions the death of Mæcenas towards the close of the same year. The clause in the will of Mæcenas, in which he recommends to Augustus his friend Horace, would lead us to conclude that Horace survived him. At all events, only a few months could have intervened between their deaths. He was married to Terentia, a woman of a disagreeable temper, from whom he frequently separated; but found his happiness so dependent on her smiles, that he soon received her back to his arms (Sen. *De Prov.* 3). Pliny states that

the health of Mæcenas was at all times delicate; and that for the last three years of his life he scarcely enjoyed an hour's sleep (vii. 52, 2). Of the writings of Mæcenas we have nothing remaining except a few epigrams, which are published in the *Anthologia Latina* of Burmann (i. 53, ii. 225, iii. 149). He was also the author of two tragedies, *Prometheus* and *Octavia*; and is supposed to have written memoirs to serve for the history of Augustus. (See Fabricius, *Bibliotheca Latina*, iii. 964; *De Mæcenatis Vita, Moribus, et Rebus Gestis*, auct. Meibom, Lugd. Bat. 1653; Lion, *Mæcenationa*, Götting, 1824; *Mémoires de l'Acad. des Inscrip.* xiii.) In Italian there is a *Life* by Cenni, Rome, 1684; by Dini, Venice, 1704: in German, by Benemann, Leips. 1744; by Lign, Götting, 1824; and by Frandsen, Altona, 1843: in French, by Richer, Paris, 1746. The only *Life* in English is by Dr Ralph Schomberg, London, 1766, 12mo.

MAELSTROM, or **MOSKOESTROM**, a whirlpool off the coast of Norway to the S.W. of the Lofoden Islands; N. Lat. 67. 48., E. Long. 12. It consists of a swift current, running every six hours alternately from N. to S. and from S. to N., contrary to the motion of the tide, thus producing a wide eddy, the noise of which is heard to a great distance. Whatever small vessel comes within its reach is immediately sucked in, and after being dashed to pieces on the rocks at the bottom is thrown up again by the whirlpool. It is least agitated about the turn of the tide, and it is then only that it can be approached with safety. The diameter of the whirlpool is about $1\frac{1}{2}$ miles.

MÆOTIS, **PALUS** or **LACUS**, in *Ancient Geography*, the modern Sea of Azoff, which see.

MAESTLIN, **MICHAEL**, a celebrated astronomer of Germany, born about 1542 in Würtemberg. He spent his youth in Italy, and during his residence in that country made the acquaintance of Galileo, whom it is said the powerful argumentation of Maestlin induced to renounce the system of Ptolemy in favour of that of Copernicus. On his return to Germany, he was appointed professor of mathematics at Tübingen, where he had Kepler for his pupil, and for whose instruction in mathematical science he declined to receive any pecuniary remuneration. Kepler afterwards speaks of his generous master in terms of gratitude and admiration, and found occasion, when Maestlin subsequently stood in need of sympathy and aid, of giving substantial expression to his affection for him. Maestlin died at Tübingen in 1590. His works are,—*De Stellâ nova, Ephemerides*, 1551; *Thesis de Eclipsibus; Observatio et Demonstratio Cometæ anni 1577 et 1578*, 4to, Tübing. 1578; *Consideratio et Observatio Cometæ 1580*, Heideib. 1581; *Alterum Examen Gregoriani Calendarii*, Tübing. 4to, 1586; *Epitomæ Astronomiæ*, Tübing. 1597.

MAESTRICHT, a strongly-fortified town of Holland, and capital of the duchy of Limburg, is situate on the left bank of the Meuse, and connected by a stone bridge of nine arches, with its suburb of Wych on the opposite bank. This is one of the strongest fortresses in Europe, being surrounded by walls and ditches, and having also a number of detached bastions, an arsenal and military magazine, and a citadel or fortress, called St Pierre, on a neighbouring height. By opening sluices a great part of the surrounding country may be laid under water. Under the hill of Petersberg, on which the citadel stands, is a subterranean stone quarry, covering a space of 13 miles by 6, and said to be intersected by 16,000 passages, forming a most intricate labyrinth. The rock is a soft, yellowish stone, abounding in curious and interesting fossils. The town is well and regularly built, having wide, clean, and well-paved streets. The town-hall, built in 1662, stands in the centre of the great market-place, and is said to be one of the finest edifices in Holland. The church of St Gervais, a fine Romanesque edifice, dating probably from the tenth century, is ornamented with five towers, and has a splendid portal. There

Maestrom
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Maestricht.

Maffei. are six Roman Catholic and three Calvinistic churches, two hospitals, two orphan asylums, a lazaretto, lyceum, public library, and society of agriculture. The chief manufactures are,—woollen and cotton stuffs, leather, soap, tobacco, fire-arms, beer, and spirits. Maestricht is connected with Aix-la-Chapelle by railway, and also carries on a considerable trade with various places on the Meuse. It has frequently suffered from sieges. In 1579 the Spaniards, under the Duke of Parma, took it by assault after a siege of four months, and put the garrison and most of the townspeople to the sword. It was also taken by Louis XIV., but was unsuccessfully attacked by William III. of England. It was bravely and successfully defended by its garrison against the Belgians in 1830. Pop. (1854) 24,394.

MAFFEI, FRANCESCO SCIPIONE, *Marquis*, a celebrated Italian writer, was born at Verona in 1675, and studied five years at the college of Parma, where he gave early manifestations of eminent ability, both in literature and science. Born of a noble family, and early admitted to familiar intercourse with men and women of culture and refinement, Maffei's mind was favourably directed from the idle frivolities with which a person of his rank is apt to waste his youth, and turned towards those nobler pursuits in which he afterwards won for himself so distinguished a name. He visited Rome in 1699, and besides acquainting himself with the monuments of that city, gained the friendship of some of her more distinguished men. Eager for all sorts of distinction, he, in 1704, joined his brother Alessandro, then lieutenant-general in the Bavarian service, and as a volunteer reaped the laurels of a soldier at the battle of Donawert. The evidence of personal bravery which S. Maffei here displayed gave dignity to his pen when he lifted it afterwards in his *Della Scienza Chiamata Cavalleresca*, to denounce the practice of duelling, then so common in his native country. In conjunction with Apostolo Zeno and Vallisneri, Maffei commenced, in 1710, the *Giornale dei Letterati*, the earliest literary journal in Italy. His *Osservazioni Letterarie*, published in 1737–40, in 6 vols., was a continuation of his literary journal after its discontinuance in 1730. He took great interest in the reformation of the Italian theatres, then in a deplorable condition; and in his work, *Trattato dei Teatri Antichi e Moderni*, defended the histrionic art against the denunciation of Father Concina, a performance which met with the approbation of Pope Benedict XIV. Nor did his efforts stop here; in 1713 he wrote, and brought upon the stage, the tragedy of *La Merope*, a work which was received with very great applause, and won for its author the title of the "Veronese Sophocles" from the celebrated Voltaire. Maffei now directed his attention more exclusively to political studies, and brought out his greatest work, the *Verona Illustrata*, a history and description of his native city, remarkable alike for extensive learning, historical insight, and elegant writing. The reputation of Maffei was spread over Europe, when, in 1732, he visited Paris, and collected materials for his *Gallia Antiquitates*, which he published at Paris during the following year. He afterwards went to England, where he was received at the court of George II., was made a member of the Royal Society, and had the degree of LL.D. conferred on him by the university of Oxford. He spent four years in travel, and returned to Italy by Holland and Germany. He died at Verona in 1755, aged eighty years. In addition to the works already mentioned, Maffei wrote three treatises against the popular belief in magic; one on the legitimacy of receiving interest on a loan of money, entitled *Dell' Impiego del Denaro* (1746), for which he suffered a temporary exile, through the influence of the Jansenists; and one, the *Museum Veronense*, on ancient inscriptions and hieroglyphics, published at Verona in 1749. A collected edition of Maffei's works was published at Venice, in 28 vols. 8vo, 1790.

MAGADOXO, or **MUKDEESHA**, an Arabian town on the E. coast of Africa, N. Lat. 2. 2., E. Long. 45. 25. It is the capital of a state of the same name, and is a place of very considerable trade, exporting ivory, gum, and a peculiar kind of cloth; and importing sugar, dates, salt fish, arms, and slaves. The town is walled, and is divided into two parts, one of which is composed entirely of tombs, while the other contains about 150 stone and a number of wooden houses, and an Arabian mosque. Pop. probably about 4000. The state extends along the coast for about 240 miles, and is estimated to have a population of about 150,000. Its sovereign is a tributary to the Iman of Muscat in Arabia.

MAGALHAENS, or **MAGELLAN**, **FERNANDO**, the discoverer of the straits known by his name, is said to have been born at Oporto, in Portugal, in the latter half of the fifteenth century. Entering the Portuguese navy at an early age, he served in the East Indies for five years under Albuquerque, and bore a distinguished part in the siege of Malacca in 1511. As he thought, however, that his achievements were not duly rewarded, he returned to Portugal to make a personal appeal for promotion to King Emmanuel himself, but was again unsuccessful. Accordingly, he opened a communication with Charles V. of Spain. Referring to the bull of Pope Alexander VI., that had divided the globe into two parts, and had assigned as their distinctive spheres of discovery the western half to the Spaniards and the eastern to the Portuguese, Magellan endeavoured to prove to that monarch that the Moluccas, then claimed by Portugal, lay within the Spanish half of the world. He also volunteered to settle the question beyond all doubt by sailing to the Moluccas by a westward instead of an eastward course. His proposal was accepted by the Spanish king; and, accordingly, on the 20th September 1519, Magellan sailed from San Lucar, in command of a squadron of five ships, with 236 men on board, and steered directly for Rio Janeiro. After taking on board at that port a fresh supply of provisions, he sailed southward along the coast, and on the 13th March 1520 entered a bay on the shore of Patagonia, to which he gave the name of San Julian. While the fleet lay wintering here, three of the captains, impatient perhaps of the control of a Portuguese, broke out into open mutiny, and by their example began to spread discontent among the crews. In a short time, however, Magellan had one of the mutineers secretly slain, another publicly executed, and the third thrust ashore on the inhospitable coast of Patagonia. On the 21st October 1520, he doubled the headland which he called Cape Virgins, and arrived at the mouth of the straits which are now known by his name. With the utmost difficulty he induced his sailors to venture into the unknown passage. One of his ships was wrecked at the entrance of the straits, another turned back in the middle; but, on the 28th of November, the remaining three, to the great joy of Magellan, issued forth into the vast ocean. Boldly directing their course across this untraversed sea, to which, on account of its calmness, they gave the name of Pacific, and sailing for more than three months without seeing land, the crews suffered great hardships from disease and want of food. On the 6th March 1521, he discovered the group of islands which, on account of the thievish propensities of the inhabitants, he called *Iadrones*. He then proceeded to another cluster of islands, formerly unknown, but afterwards called the Philippines. There the prince of the island of Zebu agreed to become tributary to Spain, on condition that Magellan should render him supreme over the chieftains of the other islands in the group. In fulfilling this agreement, Magellan encountered an obstinate resistance from the inhabitants of the small island of Matan. On 27th April 1521, after fighting for an entire day, he was forced to retreat, through lack of ammunition, and in the subsequent confusion he was felled by a stone, and despatched

Magadoxo
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Magalhaens.

Magdalena by the thrust of a lance. His fleet was conducted home by Sebastian del Cano.

MAGDALENA, a river in South America, the second in length in the republic of New Granada, rises at the junction of the Central and Eastern Cordilleras of the Andes, in the small Lake of Papus; N. Lat. 1. 58., W. Long. 76. 25. It flows northwards for 500 miles between these two ranges, and then enters the plain. After receiving from the W. the Cauca, which is nearly as large as itself, in N. Lat. 9. 25., it divides into several branches and falls into the Caribbean Sea, Lat. 11. 8., Long. 74. 50. The total length is estimated at about 800 miles, and it is navigable as far up as Honda, 435 miles from its mouth. The Magdalena is a rapid river, and the amount of its descent and the force of its current are such, that for some distance from its mouth the waters may be distinguished by their freshness from the surrounding ocean. Rapids and cataracts frequently interrupt its course, and its banks are infested with caymans and crocodiles, which, along with the excessive heat of the climate, and the swarms of mosquitoes, render the progress of the navigator anything but safe and agreeable. It is, however, the main channel of communication between the provinces in the interior and the sea. Besides the Cauca, it receives a number of smaller tributaries, the chief of which are the Sogamosa and Bogota, from the E. The chief towns on its banks are,—Neiva, Tocama, Honda, and Mompo. The department of the same name in the N. of the republic has an estimated area of about 52,000 square miles, and a population of about 337,000. It is divided into four provinces, and its chief town is Cartagena on the sea-coast.

MAGDEBURG, a fortified town of Prussia, capital of the province of Saxony, and of a cognominal government, is situate on the left bank of the Elbe, 90 miles S.W. from Berlin, with which, as well as with Hamburg, Brunswick, Leipzig, and other places, it is connected by railway. It ranks as a fortress of the first class; and in consequence of the additions and improvements which its fortifications have received since the war, it is now considered one of the strongest places in Europe. On account of its great extent it could not be invested by an army of less than from 50,000 to 100,000 men. The citadel, on an island in the Elbe, serves also as a state prison: Lafayette, Carnot, and others, have been confined in it. Magdeburg consists of three parts,—Alstadt, Neumarkt, and Friedrichstadt, besides the suburbs of Sudenburg and Neustadt. With the exception of one spacious street, called the Broadway, all the streets are narrow and crooked. There are two large public squares, the largest and finest of which is the *Domplatz*, in which is the cathedral; the other, the market-place, has in the centre an equestrian statue of the Emperor Otto, erected in 973. The *Fürstenwall*, a sort of terrace extending along the Elbe, and planted with trees, forms a very agreeable promenade. The public gardens outside the Sudenberger Gate, and by the side of the Elbe, are tastefully laid out, and much resorted to. Magdeburg contains few ancient public buildings of note, having been almost burned to the ground by Tilly in 1631, when only 139 houses were left standing. Fortunately, among those saved was the cathedral, one of the finest Gothic edifices of Northern Germany, erected between 1211 and 1363, and restored at great cost, 1825–34. It is built entirely of freestone, is 362 feet long, and has two lofty towers. It contains numerous tombs and monuments, among which is that of Otto the Great and his empress. Among the other churches are the church of the Virgin, built in the eleventh century, and the French Reformed church, dating from the latter part of the seventeenth century. The town-hall, government-house, artillery barracks, and theatre, are among the chief of its other buildings. Magdeburg is the see of a bishop, and, as the capital of a province, is the seat of a

number of important courts and offices. It has also numerous benevolent and educational institutions, among which are several hospitals and orphan asylums, a deaf-mute institution, ecclesiastical gymnasium, female high school, normal seminary, and schools for agriculture, commerce, surgery, &c.

Magdeburg is also one of the most important trading and manufacturing towns of Germany. From its position on the Elbe, and its extensive railway connection with all parts of Germany, it is an important entrepôt of trade for a great part of Germany. Steamboats ply regularly between Hamburg and Magdeburg; and by means of a canal connecting the Elbe with the Havel, it has direct water communication with Berlin and other places. The manufactures comprise woollen, linen, and cotton stuffs; gloves, lace, hats, tobacco, and earthenware. Magdeburg existed as a town as early as the eighth century. It has frequently suffered from sieges, especially in 1631, when it was taken and sacked by the imperialists under Tilly. It was taken by the French in 1806, and annexed to the then kingdom of Westphalia. In 1849 Magdeburg contained 50,996 inhabitants, besides 5185 military; the suburb of Neustadt, 10,023; and that of Sudenburg, 4284 inhabitants. In 1853 the total population of city and suburbs was 77,159. The government of Magdeburg is one of the three that compose the province of Saxony. It is divided into fifteen circles, and has an area of 4447 square miles, with, in 1852, a population of 714,268. Its soil is of great fertility, and is well cultivated.

MAGELLAN, or **MAGALHANS**, STRAIT OF, an arm of the sea which separates Patagonia from the group of islands lying to the S. of South America, of which the principal is Tierra del Fuego. It received its name from Ferdinand Magellan, who first sailed through it from the Atlantic to the Pacific. For some time after this it was thought to be the only communication between the two oceans; but since Cape Horn has been doubled, it is little used on account of the difficulty of navigation. The entrance to the channel at the eastern end is situate in about S. Lat. 52., and is 15 miles in breadth, while that on the side of the Pacific extends to 33 miles. There is, however, another arm reaching to the Pacific by Cockburn Channel and Magdalen Sound. The breadth of the main strait varies very considerably, being at one point not more than $1\frac{1}{2}$ miles across. The middle of the strait is much farther S. than either of its extremities, and the whole length is nearly 300 miles. It is bounded by precipitous rocks, rising in some places to 3000 or 4000 feet above the level of the sea, and the depth in some places is so great as to give no soundings with a line of 1500 feet. Towards the western mouth the strait is broken up by a number of islands.

MAGENDIE, **FRANÇOIS**, an eminent physiologist, the son of a physician in Paris, was born at Bordeaux in October 1783. At an early age he was removed to the capital; and after attending school for some time, became a pupil of Boyer, the eminent surgeon. He was then successively appointed *aide d'anatomie* in the Faculty of Medicine, a demonstrator, and physician to the Hotel Dieu. In 1816 he published *Précis Élémentaire de Physiologie*, 8vo, a work, which, in some of its subsequent editions, appeared under the title of *Elémens de Physiologie*. His *Recherches Physiologiques et Médicales sur les Causes, les Symptômes, et le Traitement de la Gravelle*, was published at Paris in 1818. In 1819 he became a member of the Academy of Sciences. One of his most important works, *Formulaire pour la Préparation et Emploi de plusieurs nouveaux Médicaments*, appeared in 1821, and was soon after translated into all the European languages. In 1831 Magendie became professor of anatomy in the College of France. He published in 1839 *Leçons sur les Phénomènes Physique de la Vie*, and *Leçons sur les Fonctions et les Maladies du Système Nerveux*. In 1842 was printed at Paris his *Recherches Philosophiques et Cliniques sur le Liquide Cephalo-Rachi-*

Magellan
Magendie.

Maggi
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Magi.

dien ou Cerebro-Spinal. Magendie died in October 1855. Among his important services to science may be named his demonstration that the two roots of the spinal nerves have two distinct functions. Sir Charles Bell had previously shown that the nerves sometimes perform the double function of sensation and volition, and Magendie clearly established and admirably illustrated the fact, that the two roots of the spinal nerves are always devoted to two separate functions. He likewise discovered that the veins are the principal agents in absorption; that food destitute of nitrogen is not nutritious; and that strychnia produces asphyxia by acting upon the spinal cord, and by thus paralyzing the nerves of respiration.

MAGGI, JEROME, in Latin *Magius*, one of the most learned men of the sixteenth century, was born at Anghiari in Tuscany. He applied himself to all the sciences, and even to the art of war; and distinguished himself so much in this last study, that when the Turks besieged Famagusta, he destroyed all the works of the besiegers by means of mines and fire-machines, and in an instant overthrew what had cost them infinite labour. But the Ottomans took the city in 1571, plundered his library, carried him loaded with chains to Constantinople, and after treating him in the most inhuman and barbarous manner, caused him to be strangled in prison in 1572.

MAGGIORE, LAGO. See LAGO MAGGIORE.

MAGI, the caste of hereditary priests under the Medes and Persians. Some derive their name from *mog*, or *mag*, which signifies priest in the Pehlevi language. They were in exclusive possession of scientific knowledge; and so celebrated were they in astrology and enchantment, that their name was given to all other kinds of enchanters and magicians. We find the word also used to denote any men distinguished for their wisdom. Thus the wise men of the east, in Matt. ii. 1, 7, 16, are termed Magi; and it is not difficult to perceive how, in the minds of the superstitious vulgar, this class of men should early come to be regarded under this twofold aspect. The grand doctrine of the ancient Magi, previous to the reformation effected among them by Zoroaster, was that of opposition, or strife, as the parent and original cause of all things. The two great principles which waged continual warfare throughout the universe were those of light and darkness, of good and evil, Ormuzd and Ahriman, which were destined to divide the dominion of the world, now preserving, now destroying finite things, till the final struggle should arrive, when darkness should be swallowed up of light, and the good should reign for ever. To seize upon and master those hostile powers was the chief task of the Magi, and they held that this could be effected by prayer and a true knowledge of the laws of opposition. When once this mastery was obtained, all subject to those powers were at their disposal: they could pry into futurity, raise the dead, and accomplish countless other supernatural triumphs over the limitation and suffering to which man is naturally subjected. That this system had its origin in the endeavours which thoughtful men perpetually exert after an intelligible explanation of the universe, there can be little doubt; and it can be as little doubted that their art, so far as it was real, had its foundation in a superior knowledge of the powers of nature. But what sprung originally from a love of truth, from the scientific tendencies of the human mind, could soon, in the hands of the dishonest and the grasping, be prostituted to fulfil the ends of vulgar avarice and sordid ambition; and hence the degradation of the *wise man*, the priest of science, into the *magician*, the wonder-worker, with his magical *theurgia* and wicked incantations.

Zoroaster reformed the religious doctrines and ceremonies of the Magi. (See ZOROASTER.) The best source of information for the study of the character and religion of the eastern Magi is to be found among the works of An-

quetil du Perron, who brought to Europe the celebrated books called the *Zendavesta*. (See vols. xxxiv. and xxxix. of the *Memoires de l'Academie des Inscriptions*.) Interesting information may also be obtained respecting the Magi and magic in Klenker's *Zendavesta* and *Magikon*; also, Creuzer's *Symbolik und Mythologie*; also, Windischmann and Conrad Horst on *Magic*; and Sir Walter Scott's *Demomology and Witchcraft*.

MAGIC SQUARE, a square figure, formed of a series of numbers in mathematical proportion, so disposed in parallel and equal ranks, that the sums of each row, taken either perpendicularly, horizontally, or diagonally, are equal.

Let the several numbers which compose any square number (for instance, 1, 2, 3, 4, 5, &c., to 25, the square number, inclusive) be disposed in their natural order after each other in a square figure of twenty-five cells, each in its cell; if now you change the order of these numbers, and dispose them in the cells in such manner that the five numbers which fill a horizontal rank of cells, being added together, shall make the same sum with the five numbers in any other rank of cells, whether horizontal or vertical, and even the same number with the five in each of the two diagonal ranks; this disposition of numbers is called a *magic square*, in opposition to the former disposition, which is called a *natural square*. See the following figures.

Natural Square.

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25

Magic Square.

16	14	8	2	25
3	22	20	11	9
15	6	4	23	17
24	18	12	10	1
7	5	21	19	13

The Hindus, Egyptians, and Chinese are said to have been acquainted with those arrangements at a very early period, and adhered to the belief that such squares were possessed of powers of divination.

Moschopolus, a Greek author of no great antiquity, is the first who appears to have spoken of magic squares; and, by the age in which he lived, there is reason to imagine he did not look on them merely as a mathematician. However, he has left us some rules for their construction. In the treatise of Cornelius Agrippa, so much accused of magic, we find the squares of seven numbers, viz., from three to nine inclusive, disposed magically. Bachet applied himself to the study of magic squares, on the hint which he had taken from the planetary squares of Agrippa.

After him came Frenicle, who took the same subject in hand. He gives, however, no general demonstration of his methods, and frequently seems to have no other guide than chance. It is true, his book was not published by himself, nor did it appear till after his death, viz., in 1693.

In 1703 Poignard, a canon of Brussels, published a treatise on sublime magic squares. Before him there had been no magic squares constructed but for series of natural numbers that formed a square. Instead of taking all the numbers that fill a square, he only takes as many successive numbers as there are units in the side of the square, which, in this case, are six; and these six numbers alone he disposes in such manner in the thirty-six cells, that none of them are repeated twice in the same rank, whether it be horizontal, vertical, or diagonal; whence it follows, that all the ranks, taken all the ways possible, must always make the same sum, which Poignard calls repeated progression. Instead of being confined to take these numbers according to the series and succession of the natural numbers, that is, in arithmetical progression, he takes them

Magic
Square.

Maginn

Magliabecchi.

likewise in a geometrical progression, and even in an harmonical progression.

The book of Poignard gave occasion to M. de la Hire to turn his thoughts the same way, which he did with such success that he seems to have well nigh completed the theory of magic squares. He first considers uneven squares, all his predecessors on the subject having found the construction of even ones by much the most difficult; for which reason M. de la Hire reserves these for the last.

M. de la Hire proposes a general method for uneven squares, which has some similitude to the theory of compound motions, so useful and fertile in mechanics. As that consists in decomposing motions, and resolving them into others more simple, so does M. de la Hire's method consist in resolving the square that is to be constructed, into two simple and primitive squares.

As to the even squares, M. de la Hire constructs them, like the uneven ones, by two primitive squares; but the construction of primitives is different in general, and may be so a great number of ways; and those general differences admit of a great number of particular variations, which give as many different constructions of the same even square.

Dr Franklin seems to have carried this curious speculation farther than any of his predecessors. He constructed not only a magic square of squares, but likewise a magic circle of circles. The details are not, however, of such importance as to require particular notice in this place. In addition to the writers on this subject, already specified, we may add the names of Stifels, Leibnitz, Bachet, and Ozanam. (For a complete history of this subject, see Montucla, vol. i., p. 346; Hutton's *Dictionary*; and Ozanam and Montucla's *Mathematical Recreations*.)

MAGINN, WILLIAM, LL.D., one of the most spirited and versatile of modern writers, was born at Cork in 1793. He received his elementary education at an academy, conducted by his father, in his native town; and at the early age of ten years entered Trinity College, Dublin, which afterwards honoured him with the degree of LL.D. On leaving college, he divided his time between assisting his father as a schoolmaster and contributing literary articles to various periodical publications. He began to contribute to *Blackwood's Magazine* in 1819, and the wit, irony, fun, and eloquence of "Sir Morgan O'Doherty" continued to adorn the pages of that journal till Maginn's death. In 1823 he visited London, where his elegant scholarship, pungent satire, and spirited style, soon procured for him constant employment. Maginn became joint-editor of the *Standard* newspaper in 1828; and two years afterwards established *Fraser's Magazine*, a publication to which he contributed very extensively. His trenchant, caustic pen sometimes got him into difficulties with the fashionable novelists, and Maginn was not at all slow to give "satisfaction" when it was deemed necessary. Of a generous, witty, jovial nature, he found one of his greatest snares in his fondness for society. The brilliant humorist and boon companion was sought after by every one; and by too freely submitting to the temptation to which he was thus exposed, he found, while yet in his prime, that health and means had alike deserted him. In 1842 he was cast into the Fleet prison for debt, and on being released by passing through the Insolvent Court, found himself in a state of utter beggary, from which he was relieved by death during August of the same year. He died of consumption at Walton-on-the-Thames, aged forty-eight years.

MAGLIABECCHI, ANTONIO, a scholar remarkable for his great memory, was born at Florence in 1633. Deprived of his father at the age of seven, he was apprenticed, after receiving a scanty education, to a goldsmith in his native city. Soon afterwards his thirst for reading began

to appear, and with the aid of Ermini, librarian to the Cardinal de Medici, he speedily became an adept in Latin and Hebrew. Cultivated by the most unflagging application, his memory soon became noted for its strength and accuracy; and in course of time he was appointed librarian to Cosmo III., Grand Duke of Florence. In this congenial situation he became so absorbed in his studies as to neglect the ordinary comforts of life. A commodious apartment, which he occupied in virtue of his new office, was abandoned after a sojourn of four months. In his former dwelling, to which he retired, one chair served him for a seat during the day, and another for a bed during the night. His old thread-bare cloak was also the coverlet of his couch. He died among his books in 1714, after bequeathing to the public his valuable library, now known by the title of *Magliabecchiana*. (See LIBRARIES.)

MAGNA GRÆCIA, as generally used by ancient Greek authors, consisted of the Greek cities in Southern Italy that were scattered along the shores of Lucania, Bruttii, and Calabria. The cities on the E. coast were built between 735 and 685 B.C. Of these, Sybaris, Crotona, and Metapontum, were founded by the Achæans; Tarentum by the Spartans; Siris by the Ionians; and Locri Epizephyrii by the Locrians. The Greek cities on the W. coast, with the exception of Rhegium, were of a later date, and, with the exception of that town and Velia, were merely offshoots of the colonies on the E. coast. Thus, Posidonia and Laüs were colonized from Sybaris, and Hipponium and Medma from Locri. At an early period the cities of Magna Græcia, as their general title implies, outrivalled in power and prosperity their mother country. As they were, however, descended from distinct races, and were united by no common political interest, their greatness was more apparent than real—more temporary than permanent. They were often at war among themselves, and the rapid advancement of one city was frequently the result of the fall of another. Common danger was the only motive that could league them together. Accordingly, in 393 B.C. they entered into an alliance for mutual protection against the separate attacks of Dionysius of Syracuse and the Lucanians, but were defeated by the former at the River Helorus in 389 B.C. and by the latter near Laüs in 390 B.C. Many of the cities of Magna Græcia afterwards fell before the repeated attacks of the Lucanians and Bruttians. Those that survived came under the sway of the Romans after the capture of Tarentum in 272 B.C. At the beginning of the second Punic war, however, they all revolted with the exception of Rhegium. From the severe punishment that followed this revolt they never recovered. In the time of Strabo, Rhegium, Tarentum, and Neapolis alone retained traces of their former Greek civilization.

MAGNENTIUS, a Roman emperor of the west, was of barbarian extraction, and rose to the dignity of count under the Emperor Constantine. He afterwards entered the service of Constans; and in A.D. 350, while commanding the troops that defended the banks of the Rhine, he conceived the design of wresting the sceptre from that feeble and indolent prince. With the connivance of Marcellinus, Count of the Sacred Largesses, his plot was matured and carried into execution. That dignitary invited the officers of the army, then stationed near the city of Autun, to a feast in honour of the birthday of his son, and at a late hour of the banquet introduced Magnentius arrayed in the robes and insignia of royalty. The cry of "Long live Augustus" that was raised at this signal by several conspirators, was taken up unconsciously by the excited and astonished guests; and Magnentius forthwith took possession of the imperial palace at Autun. The assassination of Constans followed immediately; and within a short time Gaul, Italy, and the greater part of the western provinces had acknowledged the title of the usurper. After raising a formidable

Magna
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army, Magnentius first attempted, but without success, to negotiate an agreement with Constantine, Emperor of the East, who was already intent upon revenging the death of his brother Constans. He then marched through Italy and Noricum into Pannonia, and in A.D. 351 repulsed the troops of Constantine on the plain of Sciscia. In the same year a battle fought before the town of Mursa, on the Drave, ended in the total defeat of Magnentius. A second routing of his forces in the defiles of the Cottian Alps completed his disaster; and when on the eve of being captured by his enemies, he died by his own hand at Lugdunum, in August A.D. 353.

MAGNES, one of the earliest of the comic poets of Athens, and the contemporary of Chionides, was a native of Icaria in Attica, and flourished during the fifth century B.C. We can gather, from what Aristotle says of him, that he was the earliest comic poet of whom any victories are recorded. An anonymous writer says he gained eleven victories, while Suidas and Eudocia affirm, that out of nine plays which he exhibited, he gained only two victories. The latter statement is rendered exceedingly questionable by a passage in Aristophanes, a writer who flourished a few years after Magnes, and who, while praising his wit and versatility, charges the Athenians with fickleness and ingratitude towards the old comedian, who, from the enjoyment of an

eminent popularity had been reduced to total neglect. *Magnesia* (*Knights*, line 520, &c.) The titles of a few of the plays of Magnes constitute almost all that can be discovered respecting them. Scarcely more than half-a-dozen lines of his works are extant. A scholiast on Aristophanes signifies the *Barbitides*, a satire on a peculiar class of musicians; the *Ludoï*, an attack on the indecent dances of the Lydians; and a few others of which the authorship is doubtful.

MAGNESIA, a city of Ionia, situate on the Lethæus, an affluent of the Mæander, was commonly called *Magnesia ad Mæandrum*, in contradistinction to *Magnesia ad Sipylum*, a town in Lydia. It is said to have been founded by a colony from Magnesia in Thessaly, and rapidly rose to wealth and power. Captured and sacked by the Cimmerians about 726 B.C., it was rebuilt in the following year by the Milesians, or, according to Athenæus, by the Ephesians. Magnesia was one of the three cities that supported Themistocles during his exile, and there the memory of that great man was long afterwards preserved by a monument erected in the *agora*. In the time of Strabo the town was noted for its magnificent temple to Artemis Leucophryene, still seen in ruins. Under the Romans it was included within the kingdom of Pergamus, and from that period it seems to have gradually declined.

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